MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual

21st Edition

For safety and warning information, please read this manual before attempting to use the equipment. Keep this manual with the equipment.

ANRITSU CORPORATION

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual



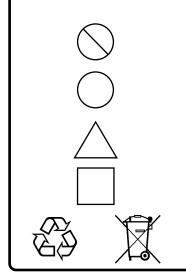
This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual

20 January 2012 (First Edition)

31 January 2022 (21st Edition)

Copyright © 2012-2022, ANRITSU CORPORATION.

All rights reserved. No part of this manual may be reproduced without the prior written permission of the publisher.

The operational instructions of this manual may be changed without prior notice. Printed in Japan

For Safety

Replacing Battery



Battery Disposal

 When replacing the battery, use the specified battery and insert it with the correct polarity. If the wrong battery is used, or if the battery is inserted with reversed polarity, there is a risk of explosion causing severe injury or death.

• DO NOT expose batteries to heat or fire. This is dangerous and can result in explosions or fire. Heating batteries may cause them to leak or explode.



ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached. If the advice in the operation manual is not followed, there is a risk of personal injury or reduced equipment performance. The alert mark shown on the left may also be used with other marks

WARNING

Overvoltage Category
 This equipment complies with overvoltage category II defined in
 IEC 61010. DO NOT connect this equipment to the power
 supply of overvoltage category III or IV.

and descriptions to indicate other dangers.

• To ensure that the equipment is grounded, always use the supplied 3-pin power cord, and insert the plug into an outlet with a ground terminal. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock or causing damage to the internal components.

 Only qualified service personnel with a knowledge of electrical fire and shock hazards should service this equipment. This equipment cannot be repaired by the operator. DO NOT attempt to remove the equipment covers or unit covers or to disassemble internal components. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

Electric Shock

Repair



For Safety

 The performance-guarantee seal verifies the integrity of the Calibration equipment. To ensure the continued integrity of the equipment, F SEAL BI only Anritsu service personnel, or service personnel of an Anritsu sales representative, should break this seal to repair or calibrate the equipment. Be careful not to break the seal by opening the ATION SE equipment or unit covers. If the performance-guarantee seal is broken by you or a third party, the performance of the equipment cannot be guaranteed. **Falling Over** This equipment should always be positioned in the correct manner. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock. Always set up the equipment in a position where the power switch can be reached without difficulty. DO NOT short the battery terminals and never attempt to **Battery Fluid** disassemble the battery or dispose of it in a fire. If the battery is damaged by any of these actions, the battery fluid may leak. This fluid is poisonous. DO NOT touch the battery fluid, ingest it, or get in your eyes. If it is accidentally ingested, spit it out immediately, rinse your mouth with water and seek medical help. If it enters your eyes accidentally, do not rub your eyes, rinse them with clean running water and seek medical help. If the liquid gets on your skin or clothes, wash it off carefully and thoroughly with clean water. LCD This equipment uses a Liquid Crystal Display (LCD). DO NOT subject the equipment to excessive force or drop it. If the LCD is subjected to strong mechanical shock, it may break and liquid may leak. This liquid is very caustic and poisonous. DO NOT touch it, ingest it, or get in your eyes. If it is ingested accidentally, spit it out immediately, rinse your mouth with water and seek medical help. If it enters your eyes accidentally, do not rub your eyes, rinse them with clean running water and

seek medical help. If the liquid gets on your skin or clothes,

wash it off carefully and thoroughly with soap and water.

	▲ CAUTION
Cleaning	 Always remove the main power cable from the power outlet before cleaning dust around the power supply and fan. Clean the power inlet regularly. If dust accumulates around the power pins, there is a risk of fire. Keep the cooling fan clean so that the ventilation holes are not obstructed. If the ventilation is obstructed, the cabinet may overheat and catch fire.
Check Terminal	 Never input a signal of more than the indicated value between the measured terminal and ground. Input of an excessive signal may damage the equipment.

For Safety -

-

Replacing Memory Back-up Battery This equipment uses a Poly-carbon monofluoride lithium battery to backup the memory. This battery must be replaced by service personnel when it has reached the end of its useful life; contact the Anritsu sales section or your nearest representative. Note: The battery used in this equipment has a maximum useful life of 7 years. It should be replaced before this period has elapsed. External This equipment uses the USB flash drive as external storage media for storing data and programs. If this media is mishandled or becomes faulty, important data may be lost. It is recommended to periodically back up all important data and programs to protect them from being lost accidentally. Anritsu will not be held responsible for lost data. Pay careful attention to the following points. • Never remove the USB flash drive from the equipment while it is being accessed. • The USB flash drive may be damaged by static electric charges. • Anritsu has thoroughly tested all external storage media not shipped with this equipment. Users should note that external storage media not shipped with this equipment may not have been tested by Anritsu, thus Anritsu cannot guarantee the performance or suitability of such media.
Storage Mediafor storing data and programs. If this media is mishandled or becomes faulty, important data may be lost. It is recommended to periodically back up all important data and programs to protect them from being lost accidentally. Anritsu will not be held responsible for lost data.Pay careful attention to the following points.Pay careful attention to the following points.Never remove the USB flash drive from the equipment while it is being accessed.The USB flash drive may be damaged by static electric charges.Anritsu has thoroughly tested all external storage media shipped with this equipment. Users should note that external storage media not shipped with this equipment may not have been tested by Anritsu, thus Anritsu cannot guarantee the performance or suitability of such
 Never remove the USB flash drive from the equipment while it is being accessed. The USB flash drive may be damaged by static electric charges. Anritsu has thoroughly tested all external storage media shipped with this equipment. Users should note that external storage media not shipped with this equipment may not have been tested by Anritsu, thus Anritsu cannot guarantee the performance or suitability of such

For Safety —

_

Hard disk	The equipment is equipped with an internal hard disk from which, as with any hard disk, data may be lost under certain conditions. It is recommended to periodically back up all important data and programs to protect them from being lost accidentally.
	Anritsu will not be held responsible for lost data.
	 To reduce the possibility of data loss, particular attention should be given to the following points. The equipment should only be used within the recommend temperature range, and should not be used in locations where the temperature may fluctuate suddenly. Always follow the guidelines to ensure that the equipment is set up in the specified manner.
	• Always ensure that the fans at the rear and side of the equipment are not blocked or obstructed in any way.
	 Exercise care not to bang or shake the equipment whilst the power is on.
	 Never disconnect the mains power at the plug or cut the power at the breaker with the equipment turned on.
Notes on Handling (When Rubidium	Please use the carrying case or the original packing materials when you transport it.
Reference Oscillator Option is Installed)	Because Rubidium Reference Oscillator frequency changes by the magnet, please do not set the one to have the magnetism (more than 0.5 Gauss) such as magnets near it.
Use in a Residential	This equipment is designed for an industrial environment.
Environment	In a residential environment this equipment may cause radio interference in which case the user may be required to take adequate measures.
Use in Corrosive Atmospheres	Exposure to corrosive gases such as hydrogen sulfide, sulfurous acid, and hydrogen chloride will cause faults and failures. Note that some organic solvents release corrosive gases.

Equipment Certificate

Anritsu Corporation certifies that this equipment was tested before shipment using calibrated measuring instruments with direct traceability to public testing organizations recognized by national research laboratories, including the National Institute of Advanced Industrial Science and Technology, and the National Institute of Information and Communications Technology, and was found to meet the published specifications.

Anritsu Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within one year after shipment due to a manufacturing fault, and software bug fixes will be performed made in accordance with the separate Software End-User License Agreement, provide, however, that Anritsu Corporation will deem this warranty void when:

- The fault is outside the scope of the warranty conditions separately described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster, including fire, wind or flood, earthquake, lightning strike, or volcanic ash, etc.
- The fault is due to damage caused by acts of destruction, including civil disturbance, riot, or war, etc.
- The fault is due to explosion, accident, or breakdown of any other machinery, facility, or plant, etc.
- The fault is due to use of non-specified peripheral or applied equipment or parts, or consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.
- The fault is due to use in unusual environments^(Note).
- The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for damage or financial loss of the customer due to the use of or a failure to use this equipment, unless the damage or loss is caused due to Anritsu Corporation's intentional or gross negligence.

Note:

For the purpose of this Warranty, "unusual environments" means use:

- In places of direct sunlight
- In dusty places
- Outdoors
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in places where chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen dioxide, or hydrogen chloride etc.) are present
- In places where high-intensity static electric charges or electromagnetic fields are present
- In places where abnormal power voltages (high or low) or instantaneous power failures occur
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places at an altitude of more than 2,000 m
- In the presence of frequent vibration or mechanical shock, such as in cars, ships, or airplanes

Anritsu Corporation Contact

In the event of this equipment malfunctions, please contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

Notes On Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

Trademark and Registered Trademark

 $IQproducer^{\ensuremath{\mathsf{TM}}}$ is a registered trademark of Anritsu Corporation.

Lifetime of Parts

The life span of certain parts used in this instrument is determined by the operating time or the power-on time. Due consideration should be given to the life spans of these parts when performing continuous operation over an extended period. These parts must be replaced at the customer's expense even if within the guaranteed period described in Warranty at the beginning of this manual.

LCD	:	50 000 hours
Hard disk	:	600 000 (Load/Unload)
Hard disk connector	:	500 (Insertion/Removal)
Cooling fan	:	40 000 hours

Crossed-out Wheeled Bin Symbol

Equipment marked with the Crossed-out Wheeled Bin Symbol complies with council directive 2012/19/EU (the "WEEE Directive") in European Union.



For Products placed on the EU market after August 13, 2005, please contact your local Anritsu representative at the end of the product's useful life to arrange disposal in accordance with your initial contract and the local law.

Software End-User License Agreement (EULA)

Please carefully read and accept this Software End-User License Agreement (hereafter this EULA) before using (includes executing, copying, installing, registering, etc.) this Software (includes programs, databases, scenarios, etc., used to operate, set, etc., Anritsu electronic equipment, etc.). By using this Software, you shall be deemed to have agreed to be bound by the terms of this EULA, and Anritsu Corporation (hereafter Anritsu) hereby grants you the right to use this Software with the Anritsu specified equipment (hereafter Equipment) for the purposes set out in this EULA.

Article 1. Grant of License and Limitations

- 1. You may not sell, transfer, rent, lease, lend, disclose, sublicense, or otherwise distribute this Software to third parties, whether or not paid therefor.
- 2. You may make one copy of this Software for backup purposes only.
- 3. You are not permitted to reverse engineer, disassemble, decompile, modify or create derivative works of this Software.
- 4. This EULA allows you to install one copy of this Software on one piece of Equipment.

Article 2. Disclaimers

To the extent not prohibited by law, in no event shall Anritsu be liable for direct, or any incidental, special, indirect or consequential damages whatsoever, including, without limitation, damages for loss of profits, loss of data, business interruption or any other commercial damages or losses, and damages claimed by third parties, arising out of or related to your use or inability to use this Software, unless the damages are caused due to Anritsu's intentional or gross negligence.

Article 3. Limitation of Liability

 If a fault (bug) is discovered in this Software, making this Software unable to operate as described in the operation manual or specifications even though you have used this Software as described in the manual, Anritsu shall at its own discretion, fix the bug, or replace the software, or suggest a workaround, free-of-charge, provided, however, that the faults caused by the following items and any of your lost or damaged data whatsoever shall be excluded from repair and the warranty.

- i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.
- ii) If this Software has been used in conjunction with other non-Anritsu-approved software.
- iii) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
- iv) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, or any devices other than this Equipment, etc.
- 2. Expenses incurred for transport, hotel, daily allowance, etc., for on-site repairs or replacement by Anritsu engineers necessitated by the above faults shall be borne by you.
- 3. The warranty period for faults listed in Section 1 of this Article shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair or replacement, whichever is longer.

Article 4. Export Restrictions

You shall not use or otherwise export or re-export directly or indirectly this Software except as authorized by the laws and regulations of Japan and the United States, etc. In particular, this Software shall not be exported or re-exported (a) into any Japan or US embargoed countries or (b) to anyone restricted by the Japanese export control regulations, or the US Treasury Department's list of Specially Designated Nationals or the US Department of Commerce Denied Persons List or Entity List. In using this Software, you warrant that you are not located in any such embargoed countries or on any such lists. You also agree that you will not use or otherwise export or re-export this Software for any purposes prohibited by the Japanese and US laws and regulations, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction, and conventional weapons.

Article 5. Change of Terms

Anritsu may change without your approval the terms of this EULA if the changes are for the benefit of general customers, or are reasonable in light of the purpose of this EULA and circumstances of the changes. At the time of change, Anritsu will inform you of those changes and its effective date, as a general rule 45 days, in advance on its website, or in writing or by e-mail.

Article 6. Termination

 Anritsu may terminate this EULA immediately if you violate any conditions described herein. This EULA shall also be terminated immediately by Anritsu if there is any good reason that it is deemed difficult to continue this EULA, such as your violation of Anritsu copyrights, patents, etc. or any laws and ordinances, or if it turns out that you belong to an antisocial organization or has a socially inappropriate relationship with members of such organization.

2. You and Anritsu may terminate this EULA by a written notice to the other party 30 days in advance.

Article 7. Damages

If Anritsu suffers any damages or loss, financial or otherwise, due to your violation of the terms of this EULA, Anritsu shall have the right to seek proportional damages from you.

Article 8. Responsibility after Termination Upon termination of this EULA in accordance with Article 6, you shall cease all uses of this Software immediately and shall as directed by Anritsu either destroy or return this Software and any backup copies, full or partial, to Anritsu

Article 9. Negotiation for Dispute Resolution

If matters of interpretational dispute or items not covered under this EULA arise, they shall be resolved by negotiations in good faith between you and Anritsu.

Article 10. Governing Law and Court of Jurisdiction

This EULA shall be governed by and interpreted in accordance with the laws of Japan without regard to the principles of the conflict of laws thereof, and any disputes arising from or in relation to this EULA that cannot be resolved by negotiation described in Article 9 shall be subject to and be settled by the exclusive agreed jurisdiction of the Tokyo District Court of Japan.

Revision History:

February 29th, 2020 December 17th, 2021

Using VISA Driver for Remote Control of This Equipment

When controlling this measuring equipment remotely using the Ethernet port, a VISA^{*1} driver must be installed in the PC controller. We recommend using NI-VISA^{™*2} from National Instruments[™] (NI hereafter) as the VISA driver.

Although a license is generally required to use NI-VISA[™], the licensed NI-VISA[™] driver is provided free-of-charge for use when performing remote control ^(Note) of this measuring equipment.

The NI-VISA[™] driver can be downloaded from the NI website at:

https://www.ni.com

Be sure to comply with the NI license agreement for the usage and license scope.

Be sure to uninstall the NI-VISA[™] driver when disposing of this measuring equipment or transferring it to a third party, etc., when ceasing to use NI-VISA[™], or upon completion of the contract term when using this equipment on a rental contract.

(Notes)

Although the NI-VISA[™] driver itself can be downloaded free-of-charge from the web, an implementation license is required for legal reasons when some requirements are not met. (Check the NI web page for the detailed requirements.)

If these requirements are not met, permission is not granted to use NI hardware and software and an NI implementation license must be purchased. However, since this measuring equipment incorporates NI hardware (GPIB ASIC), the NI-VISA[™] driver can be downloaded and used free-of-charge.

Glossary of Terms:

- *1: VISA: Virtual Instrument Software Architecture I/O software specification for remote control of measuring instruments using interfaces such as GPIB, Ethernet, USB, etc.
 *2: NI-VISA™
 - World de facto standard I/O software interface developed by NI and standardized by the VXI Plug&Play Alliance.

Trademarks:

- National Instruments[™], NI[™], NI-VISA[™] and National Instruments Corporation are all trademarks of National Instruments Corporation.

Notice

The following actions are strictly prohibited for all of the software installed in this product or otherwise provided by Anritsu:

- 1. Copying, except for archival purposes.
- 2. Transferring to a third party separately from this product.
- 3. Analyzing the incorporated software including but not limited to modifying, decompiling, disassembling, and reverse engineering.

Cautions against computer virus infection

•	Copying files and data
	Only files that have been provided directly from Anritsu or generated
	using Anritsu equipment should be copied to the instrument.
	All other required files should be transferred by means of USB flash
	drive or CompactFlash media after undergoing a thorough virus
	check.
•	Adding software
	Do not download or install asthware that has not been apositically

- Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
 Ensure that the network has sufficient anti-virus security protection in place.
- Protection against malware (malicious software such as viruses).
 - This equipment runs on Windows Operating System.

To connect this equipment to network, the following is advised.

- Activate Firewall.
- Install important updates of Windows.
- Use antivirus software.

CE Conformity Marking

Anritsu affixes the CE conformity marking on the following products in accordance with the Decision 768/2008/EC to indicate that they conform to the EMC, LVD, and RoHS directive of the European Union (EU).

CE marking



1. Product Model

Model:

MG3710E Vector Signal Generator MG3740A Analog Signal Generator

2. Applied Directive

- EMC: Directive 2014/30/EU
- LVD: Directive 2014/35/EU
- RoHS: Directive 2011/65/EU, (EU) 2015/863

3. Applied Standards

• EMC: Emission: EN 61326-1: 2013 (Class A) Immunity: EN 61326-1: 2013 (Table 2)

	Performance Criteria*
IEC 61000-4-2 (ESD)	В
IEC 61000-4-3 (EMF)	А
IEC 61000-4-4 (Burst)	В
IEC 61000-4-5 (Surge)	В
IEC 61000-4-6 (CRF)	А
IEC 61000-4-8 (RPFMF)	А
IEC 61000-4-11 (V dip/short)	B, C

- *: Performance Criteria
 - A: The equipment shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the

equipment if used as intended.

- B: The equipment shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
- C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

Harmonic current emissions:

EN 61000-3-2: 2014 (Class A equipment)

- LVD: EN 61010-1: 2010 +A1:2019 (Pollution Degree 2)
- RoHS: EN IEC 63000:2018 (Category 9)

If the third digit of the serial number is "7", the product complies with Directive 2011/65/EU as amended by (EU) 2015/863.

(Pb,Cd,Cr6+,Hg,PBB,PBDE,DEHP,BBP,DBP,DIBP) If the third digit of the serial number is "6", the product complies with Directive 2011/65/EU.

(Pb,Cd,Cr6+,Hg,PBB,PBDE)



Serial number example

4. Contact

Name: Address, city:

Country:

Anritsu GmbH Nemetschek Haus, Konrad-Zuse-Platz 1 81829 München, Germany

UKCA Marking

Anritsu affixes the UKCA marking on the following products in accordance with the guidance to indicate that they conform to the EMC, LVD, and RoHS regulations in the United Kingdom.

UKCA marking

UK CA

1. Product Model

Model:

MG3710E Vector Signal Generator MG3740A Analog Signal Generator

2. Applied Regulations

- EMC: S.I. 2016 No. 1091 LVD: S.I. 2016 No. 1101
- RoHS: S.I. 2012 No. 3032

3. Applied Standards

- EMC: Emission: EN 61326-1: 2013 (Class A) Immunity: EN 61326-1: 2013 (Table 2)
- LVD: EN 61010-1: 2010 +A1:2019 (Pollution Degree 2)
- RoHS: EN IEC 63000: 2018 (Category 9)

4. Contact

Name:	ANRITSU EMEA Ltd.
Address, city:	200 Capability Green, Luton
	Bedfordshire, LU1 3LU
Country:	United Kingdom

RCM Conformity Marking

Anritsu affixes the RCM mark on the following products in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

RCM marking



1. Product Model

Model:

MG3710A Vector Signal Generator MG3710E Vector Signal Generator MG3740A Analog Signal Generator

2. Applied Standards

EMC: Emission: EN 61326-1: 2013 (Class A equipment)

About Eco label



The label shown on the left is attached to Anritsu products meeting our environmental standards.

Details about this label and the environmental standards are available on the Anritsu website at https://www.anritsu.com/

About This Manual

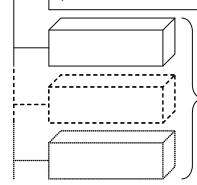
Composition of Operation Manuals

The operation manuals for the MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator are comprised as shown in the figure below. Details on the software application IQproducer[™] and the standard waveform pattern are provided in each operation manual separately. Read them when needed in addition to this manual.

MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Main frame)

> MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer[™])

MG3710A/MG3710E Vector Signal Generator Operation Manual (Standard Waveform Pattern)



IQproducer[™] Operation Manuals for each communication system

Waveform Pattern Operation Manuals for each communication system

Scope of This Manual

This manual mainly describes operation, maintenance, and remote control of the MG3710A/MG3710E Vector Signal Generator. Description of the basic functions and the outline of operation start from Chapter 3 onwards.

Name Used in IQproducer[™] Operation Manuals and Waveform Pattern Operation Manuals for Each Communication System

In IQproducerTM operation manuals and Waveform Pattern operation manuals for each communication system, it is assumed that you use MG3710A unless otherwise noted. If you use MG3710E, read MG3710A as MG3710E.

Table of Contents

For Safe	ety	iii
About T	his Manual	I
Chapter	1 Outline	1-1
1.1	Product Overview	1-2
1.2	Product Configuration	1-3
Chapter	2 Preparation	2-1
2.1	Installation Location	2-2
2.2	Items to Check Before Use	2-4

Chapter 3 Operation3-13.1 Part Names3-2

5.1		J-2
3.2	Power On/Off	3-11
3.3	Screen Layout	3-14
3.4	Top Function Menu	3-32
3.5	Common Setting Operations	3-36

Chapter 4 Frequency 4-1

4.1	Frequency	4-2
4.2	Frequency Setting Method: Frequency	4-6
4.3	Frequency Setting Items	4-12
4.4	Channel Setting	4-20
4.5	Channel Table: Edit Table	4-26
4.6	Frequency-Related Functions	4-41

Chapter 5 Output Level..... 5-1

5.1	Output Level	5-2
5.2	Output Level Setting Method: Level	5-7
5.3	Output Level Setting Item	5-14
5.4	User Correction: Correction	5-30
5.5	Use Power Sensor	5-45

Chapter 6 Sweep/List 6-1 6.1 Sweep/List Function 6-2 6.2 Setting Item 6-5 6.3 Sweep Function 6-18 6.4 List Function: Configure Step Sweep 6-29 6.5 Point Trigger 6-46

1.7	
7.5	AWGN7-228
7.6	I/Q Modulation7-236

Chapter 8 BER Measurement 8-1 8.1 Function, Performance, and Communication 8-2

0.1	r unclion, r enormance, and communication	0-2
8.2	Display Description	8-6
8.3	Performing BER Measurement	8-12
8.4	PN Fix Pattern	8-35
8.5	User Defined Pattern	8-43
8.6	BER Log	8-54
07		0.04

8.7 About BER Measurement Operations 8-61

Chapter	9 Other Functions	9-1
9.1	Auxiliary Function	9-3
9.2	Power Meter	9-4
9.3	Alarm History	9-21
9.4	Utility Function	9-25
9.5	Panel Keys	9-54
9.6	Touch Panel	9-80
9.7	Setting Windows	9-83

Chapter 10 Performance Test 10-1

10.1	Overview of Performance Test	10-2
10.2	Frequency Performance Test	10-4

- 10.3 Output Level Performance Test...... 10-7
- 10.4 Vector Modulation Performance Test 10-11

Chapter 11 Maintenance 11-1

11.1	Daily Maintenance and Storage 11-2
11.2	Repacking and Transportation upon Return 11-4
11.3	Disposal 11-5
11.4	Calibration 11-6
11.5	How to Replace Hard Disk11-10
11.6	Troubleshooting

Appendix A	Specifications	A-1
Appendix B	Error Messages	B-1
Appendix C	Default Value List	C-1

Appendix D	Performance Test Report Form	
		D-1
Appendix E	Remote Control	E-1
Appendix F	Native Device Message	
	Details	F-1
Appendix G	SCPI Compatible Command	G-1
Appendix H	Panel Keys and	
	Keyboard Operations	H-1
Appendix I	Scanning for Virus	I-1
Appendix J	MG3641A/42A	
	Compatible Command	J-1
Index	Ind	ex-1

Chapter 1 Outline

This section provides an outline of the product and describes the product composition.

1.1	Produc	ct Overview	1-2
1.2	Produc	ct Configuration	1-3
	1.2.1	Standard configuration	1-3
	1.2.2	Options	1-4
	1.2.3	Applicable parts	1-10
	1.2.4	Application software	1-12

1.1 Product Overview

The MG3710A/MG3710E is a vector signal generator that includes an arbitrary waveform generator. It can be used for a wide range of applications, from R&D to manufacturing of digital mobile communication systems, devices, and equipment.

The MG3710A/MG3710E has the following features, and one MG3710A/MG3710E can address from the current major mobile communications to the next-generation mobile communications.

- Frequency range covered: 100 kHz to 6000 MHz (with option installed)
- RF modulation bandwidth during internal modulation: 120 MHz
- Internal memory: 1024 M samples (with option installed)
- High-capacity memory included: provides ability of accelerating signals from multiple communication systems and outputting them for interference signals.

The MG3740A is an analog signal generator. It can be used for a wide range of applications, from R&D to manufacturing of analog radio base stations, devices, and equipment.

The MG3740A has the following features, and one MG3740A can address from the current major analog communications to the digitization of the conventional analog radio.

- Outstanding signal purity
- High output power
- High frequency stability
- Analog/pulse modulation supported
- Two SG units installed in one chassis available (with option added)
- Additional narrow band digital modulation function available

The supplied CD contains application software. This application software allows baseband waveform data generation supporting communication systems, external data conversion, and transmission to the MG3710A/MG3710E/MG3740A.

The MG3710A/MG3710E/MG3740A is equipped with the hardware product made by National Instruments and comes with the license for NI-VISA. NI-VISA can be used for the purpose of controlling the MG3710A/MG3710E/MG3740A.

1.2 Product Configuration

1.2.1 Standard configuration

Table 1.2.1-1 lists the standard composition of the MG3710A/MG3710E/MG3740A. At unpacking, check that all items are included. If anything is missing or damaged, contact an Anritsu Service and Sales office.

Items	Model/ Symbol	Product Name	Q'ty	Remarks
Main unit	MG3710A	Vector Signal Generator		
	MG3710E	Vector Signal Generator	1	
	MG3740A	Analog Signal Generator		
Accessories		Power cord	1	
	P0031A	USB memory	1	256 MB or more
			T	USB 2.0 Flash Driver
		Installation CD-ROM	1	Application software, operation manual CD-ROM

Table 1.2.1-1 Standard Composition

1.2.2 Options

Tables 1.2.2-1 through 1.2.2-3 list the options for MG3710A. Tables 1.2.2-4 through 1.2.2-6 list the options for MG3710E. Tables 1.2.2-7 through 1.2.2-9 list the options for MG3740A. They are all sold separately.

Note:

There is a risk of losing the data when adding additional option(s), so **back up the data** stored on the hard disk, in advance. Anritsu is not responsible for any loss of data.

Option No.	Product Name	Remarks	
MG3710A-001	Rubidium Reference Oscillator	Discontinued $\pm 1 \times 10^{-10}$ /month	
MG3710A-002	High Stability Reference Oscillator	Discontinued $\pm 1 \times 10^{-7}/\text{year}$	
MG3710A-011	2ndary HDD	Discontinued	
MG3710A-017	Universal Input/Output		
MG3710A-018	Analog IQ Input/Output		
MG3710A-021	BER Test Function		
MG3710A-029	OS Upgrade to Windows7		
MG3710A-032	1st RF 100kHz to 2.7GHz	Discontinued Once this option is	
MG3710A-034	1st RF 100kHz to 4GHz	installed, you cannot	
MG3710A-036	1st RF 100kHz to 6GHz	change the frequency range.	
MG3710A-041	High Power Extension for 1st RF	Discontinued	
MG3710A-042	Low Power Extension for 1st RF		
MG3710A-043	Reverse Power Protection for 1st RF		
MG3710A-045	ARB Memory Upgrade 256M sample for 1st RF		
MG3710A-046	ARB Memory Upgrade 1024M sample for 1st RF		
MG3710A-048	Combination of Baseband Signal for 1st RF		
MG3710A-049	AWGN for 1st RF		
MG3710A-050	Additional Analog Modulation Input for 1st RF		
MG3710A-062	2nd RF 100kHz to 2.7GHz	Discontinued Once this option is	
MG3710A-064	2nd RF 100kHz to 4GHz	installed, you cannot	
MG3710A-066	2nd RF 100kHz to 6GHz	change the frequency range.	
MG3710A-071	High Power Extension for 2nd RF	Discontinued	
MG3710A-072	Low Power Extension for 2nd RF		
MG3710A-073	Reverse Power Protection for 2nd RF		
MG3710A-075	ARB Memory Upgrade 256M sample for 2nd RF		
MG3710A-076	ARB Memory Upgrade 1024M sample for 2nd RF		

Table 1.2.2-1 Additional Options at Shipping (MG3710A)

Option No.	Product Name	Remarks
MG3710A-078	Combination of Baseband Signal for 2nd RF	Discontinued
MG3710A-079	AWGN for 2nd RF	
MG3710A-080	2nd RF Additional Analog Modulation Input	
MG3710A-313	Removable HDD	

Table 1.2.2-1 Additional Options at Shipping (MG3710A) (Cont'd)

Table 1.2.2-2 Additional Options after Shipping (MG3710A)

Option No.	Product Name	Remarks
MG3710A-101	Rubidium Reference Oscillator Retrofit	$\pm 1 \times 10^{-10}$ /month
MG3710A-102	High Stability Reference Oscillator Retrofit	$\pm 1 \times 10^{-7}$ /year
MG3710A-111	2ndary HDD Retrofit	
MG3710A-117	Universal Input/Output Retrofit	
MG3710A-118	Analog IQ Input/Output	
MG3710A-121	BER Test Function Retrofit	
MG3710A-141	High Power Extension for 1st RF Retrofit	
MG3710A-142	Low Power Extension for 1st RF Retrofit	
MG3710A-143	Reverse Power Protection for 1st RF Retrofit	
MG3710A-145	ARB Memory Upgrade 256M sample for 1st RF Retrofit	
MG3710A-146	ARB Memory Upgrade 1024M sample for 1st RF Retrofit	
MG3710A-148	Combination of Baseband Signal for 1st RF Retrofit	
MG3710A-149	AWGN for 1st RF Retrofit	
MG3710A-150	Additional Analog Modulation Input Retrofit for 1st RF	
MG3710A-162	2nd RF 100kHz to 2.7GHz Retrofit	Discontinued
MG3710A-164	2nd RF 100kHz to 4GHz Retrofit	
MG3710A-166	2nd RF 100kHz to 6GHz Retrofit	
MG3710A-171	High Power Extension for 2nd RF Retrofit	
MG3710A-172	Low Power Extension for 2nd RF Retrofit	
MG3710A-173	Reverse Power Protection for 2nd RF Retrofit	
MG3710A-175	ARB Memory Upgrade 256M sample for 2nd RF Retrofit	
MG3710A-176	ARB Memory Upgrade 1024M sample for 2nd RF Retrofit	
MG3710A-178	Combination of Baseband Signal for 2nd RF Retrofit	
MG3710A-179	AWGN for 2nd RF Retrofit	
MG3710A-180	2nd RF Additional Analog Modulation Input Retrofit	
MG3710A-181	CPU/Windows7 Upgrade Retrofit	Discontinued
MG3710A-182	CPU/Windows10 Upgrade Retrofit	

Chapter 1 Outline

Option No.	Product Name	Remarks
MG3710A-ES210	Extended 2-year warranty service	Discontinued
MG3710A-ES310	Extended 3-year warranty service	
MG3710A-ES510	Extended 5-year warranty service	

Table 1.2.2-3 Warranty Period Extension Options (MG3710A)

Table 1.2.2-4 Additional Options at Shipping (MG3710E)

Option No.	Product Name	Remarks
MG3710E-001	Rubidium Reference Oscillator	$\pm 1 \times 10^{-10}$ /month
MG3710E-002	High Stability Reference Oscillator	$\pm 1 \times 10^{-7}$ /year
MG3710E-011	2ndary HDD	
MG3710E-017	Universal Input/Output	
MG3710E-018	Analog IQ Input/Output	
MG3710E-021	BER Test Function	
MG3710E-032	1st RF 100kHz to 2.7GHz	Once this option is
MG3710E-034	1st RF 100kHz to 4GHz	installed, you cannot change the frequency
MG3710E-036	1st RF 100kHz to 6GHz	range.
MG3710E-041	High Power Extension for 1st RF	
MG3710E-042	Low Power Extension for 1st RF	
MG3710E-043	Reverse Power Protection for 1st RF	
MG3710E-045	ARB Memory Upgrade 256M sample for 1st RF	
MG3710E-046	ARB Memory Upgrade 1024M sample for 1st RF	
MG3710E-048	Combination of Baseband Signal for 1st RF	
MG3710E-049	AWGN for 1st RF	
MG3710E-050	Additional Analog Modulation Input for 1st RF	
MG3710E-062	2nd RF 100kHz to 2.7GHz	Once this option is
MG3710E-064	2nd RF 100kHz to 4GHz	installed, you cannot change the frequency
MG3710E-066	2nd RF 100kHz to 6GHz	range.
MG3710E-071	High Power Extension for 2nd RF	
MG3710E-072	Low Power Extension for 2nd RF	
MG3710E-073	Reverse Power Protection for 2nd RF	
MG3710E-075	ARB Memory Upgrade 256M sample for 2nd RF	
MG3710E-076	ARB Memory Upgrade 1024M sample for 2nd RF	
MG3710E-078	Combination of Baseband Signal for 2nd RF	
MG3710E-079	AWGN for 2nd RF	
MG3710E-080	2nd RF Additional Analog Modulation Input	

Option No.	Product Name	Remarks	
MG3710E-101	Rubidium Reference Oscillator Retrofit	$\pm 1 \times 10^{-10}$ /month	
MG3710E-102	High Stability Reference Oscillator Retrofit	$\pm 1 \times 10^{-7}$ /year	
MG3710E-111	2ndary HDD Retrofit		
MG3710E-117	Universal Input/Output Retrofit		
MG3710E-118	Analog IQ Input/Output		
MG3710E-121	BER Test Function Retrofit		
MG3710E-141	High Power Extension for 1st RF Retrofit		
MG3710E-142	Low Power Extension for 1st RF Retrofit		
MG3710E-143	Reverse Power Protection for 1st RF Retrofit		
MG3710E-145	ARB Memory Upgrade 256M sample for 1st RF Retrofit		
MG3710E-146	ARB Memory Upgrade 1024M sample for 1st RF Retrofit		
MG3710E-148	Combination of Baseband Signal for 1st RF Retrofit		
MG3710E-149	AWGN for 1st RF Retrofit		
MG3710E-150	Additional Analog Modulation Input Retrofit for 1st RF		
MG3710E-162	2nd RF 100kHz to 2.7GHz Retrofit	Available only when 2nd RF is not installed.	
MG3710E-164	2nd RF 100kHz to 4GHz Retrofit	Once this option is installed, you cannot	
MG3710E-166	2nd RF 100kHz to 6GHz Retrofit	change the frequency range.	
MG3710E-171	High Power Extension for 2nd RF Retrofit		
MG3710E-172	Low Power Extension for 2nd RF Retrofit		
MG3710E-173	Reverse Power Protection for 2nd RF Retrofit		
MG3710E-175	ARB Memory Upgrade 256M sample for 2nd RF Retrofit		
MG3710E-176	ARB Memory Upgrade 1024M sample for 2nd RF Retrofit		
MG3710E-178	Combination of Baseband Signal for 2nd RF Retrofit		
MG3710E-179	AWGN for 2nd RF Retrofit		
MG3710E-180	2nd RF Additional Analog Modulation Input Retrofit		
MG3710E-182	CPU/Windows10 Upgrade Retrofit		

Table 1.2.2-5 Additional Options after Shipping (MG3710E)

Table 1.2.2-6	Warranty Period Ex	tension Options (MG3710E)
---------------	--------------------	---------------------------

Option No.	Product Name	Remarks
MG3710E-ES210	Extended 2-year warranty service	
MG3710E-ES310	Extended 3-year warranty service	
MG3710E-ES510	Extended 5-year warranty service	

Chapter 1 Outline

Option No.	Product Name	Remarks	
MG3740A-001	Rubidium Reference Oscillator	$\pm 1 \times 10^{-10}$ /month	
MG3740A-002	High Stability Reference Oscillator	$\pm 1 \times 10^{-7}$ /year	
MG3740A-011	2ndary HDD		
MG3740A-017	Universal Input/Output		
MG3740A-020	Digital Modulation		
MG3740A-021	BER Test Function		
MG3740A-029	OS Upgrade to Windows7	Discontinued	
MG3740A-032	1st RF 100kHz to 2.7GHz	Once this option is	
MG3740A-034	1st RF 100kHz to 4GHz	installed, you cannot change the frequency	
MG3740A-036	1st RF 100kHz to 6GHz	range.	
MG3740A-041	High Power Extension for 1st RF		
MG3740A-042	Low Power Extension for 1st RF		
MG3740A-043	Reverse Power Protection for 1st RF		
MG3740A-045	ARB Memory Upgrade 256M sample for 1st RF		
MG3740A-048	Combination of Baseband Signal for 1st RF		
MG3740A-050	Additional Analog Modulation Input for 1st RF		
MG3740A-062	2nd RF 100kHz to 2.7GHz	Once this option is	
MG3740A-064	2nd RF 100kHz to 4GHz	installed, you cannot	
MG3740A-066	2nd RF 100kHz to 6GHz	- change the frequency range.	
MG3740A-071	High Power Extension for 2nd RF		
MG3740A-072	Low Power Extension for 2nd RF		
MG3740A-073	Reverse Power Protection for 2nd RF		
MG3740A-075	ARB Memory Upgrade 256M sample for 2nd RF		
MG3740A-078	Combination of Baseband Signal for 2nd RF		
MG3740A-080	2nd RF Additional Analog Modulation Input		
MG3740A-313	Removable HDD	Discontinued	

Table 1.2.2-7 Additional Options at Shipping (MG3740)

1.2 Product Configuration

Option No.	Product Name	Remarks
MG3740A-101	Rubidium Reference Oscillator Retrofit	$\pm 1 \times 10^{-10}$ /month
MG3740A-102	High Stability Reference Oscillator Retrofit	$\pm 1 \times 10^{-7}$ /year
MG3740A-111	2ndary HDD Retrofit	
MG3740A-117	Universal Input/Output Retrofit	
MG3740A-120	Digital Modulation Retrofit	
MG3740A-121	BER Test Function Retrofit	
MG3740A-141	High Power Extension for 1st RF Retrofit	
MG3740A-142	Low Power Extension for 1st RF Retrofit	
MG3740A-143	Reverse Power Protection for 1st RF Retrofit	
MG3740A-145	ARB Memory Upgrade 256M sample for 1st RF Retrofit	
MG3740A-148	Combination of Baseband Signal for 1st RF Retrofit	
MG3740A-150	Additional Analog Modulation Input Retrofit for 1st RF	
MG3740A-162	2nd RF 100kHz to 2.7GHz Retrofit	Available only when 2nd RF is not installed.
MG3740A-164	2nd RF 100kHz to 4GHz Retrofit	Once this option is installed, you cannot
MG3740A-166	2nd RF 100kHz to 6GHz Retrofit	change the frequency range.
MG3740A-171	High Power Extension for 2nd RF Retrofit	
MG3740A-172	Low Power Extension for 2nd RF Retrofit	
MG3740A-173	Reverse Power Protection for 2nd RF Retrofit	
MG3740A-175	ARB Memory Upgrade 256M sample for 2nd RF Retrofit	
MG3740A-178	Combination of Baseband Signal for 2nd RF Retrofit	
MG3740A-180	2nd RF Additional Analog Modulation Input Retrofit	
MG3740A-181	CPU/Windows7 Upgrade Retrofit Discontinued	
MG3740A-182	CPU/Windows10 Upgrade Retrofit	

Table 1.2.2-8 Additional Options after Shipping (MG3740A)

Table 1.2.2-9 Warranty Period Extension Options (MG3740A)

Option No.	Product Name	Remarks
MG3740A-ES210	Extended 2-year warranty service	
MG3740A-ES310	Extended 3-year warranty service	
MG3740A-ES510	Extended 5-year warranty service	

1.2.3 Applicable parts

Table 1.2.3-1 lists the applicable parts for MG3710A/MG3710E/MG3740A. They are all sold separately.

Model/Symbol	Product Name	Remarks
W3580AE	MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)	Printed version
W2496AE	MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer TM)	Printed version
W3581AE	MG3710A/MG3710E Vector Signal Generator Operation Manual (Standard Waveform Pattern)	Printed version
K240B	Power divider (K connector)	DC to 26.5 GHz, 50 Ω K-J, 1 W max
MA1612A	Four-port junction pad	5 MHz to 3 GHz, N-J
MP752A	Termination	Discontinued. DC to 12.4 GHz, 50 Ω N-P
J1755A	Termination	DC to 18 GHz, 50 Ω N-P
MA2512A	Bandpass filter	Discontinued. Supports W-CDMA, Passband: 1.92 to 2.17 GHz
J0576B	Coaxial cord	Length: Approx. 1 m (N-P•5D-2W•N-P)
m J0576D	Coaxial cord	Length: Approx. 2 m (N-P • 5D-2W • N-P)
J0127A	Coaxial cord	Length: Approx. 1 m (BNC-P•RG58A/U•BNC-P)
J0127B	Coaxial cord	Length: Approx. 2 m (BNC-P•RG58A/U•BNC-P)
J0127C	Coaxial cord	Length: Approx. 0.5 m (BNC-P•RG58A/U•BNC-P)
J0322A	Coaxial Cable	DC to 18 GHz, Length: Approx. 0.5 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)
J0322B	Coaxial Cable	DC to 18 GHz, Length: Approx. 1 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)
J0322C	Coaxial Cable	DC to 18 GHz, Length: Approx. 1.5 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)
J0322D	Coaxial Cable	DC to 18 GHz, Length: Approx. 2 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)
J0004	Coaxial adapter	DC to 12.4 GHz, 50 Ω N-P, SMA-J
J1261B	Shielded Ethernet cable	Straight cable, length: Approx. 3 m
J1261D	Shielded Ethernet cable	Cross cable, length: Approx. 3 m
J0008	GPIB connection cable	Length: Approx. 2 m
J1539A	Aux Conversion Adaptor	BNC-J – DX30A-50P (50)

Table 1.2.3-1 Applicable Parts

1.2 Product Configuration

Model/Symbol	Product Name	Remarks
B0635A	Rack mount kit (EIA)	
B0657A	Rack mount kit (JIS)	
B0636A	Carrying case (hard type)	Discontinued. With casters
B0636C	Carrying case (hard type)	With casters
B0645A	Soft carrying case	
MA24106A	USB Power Sensor	(50 MHz to 6 GHz, With USB/Mini B cable)
MA24118A	USB Power Sensor	(10 MHz to 18 GHz, With USB/Micro B cable)
MA24126A	USB Power Sensor	(10 MHz to 26 GHz, With USB/Micro B cable)
Z0975A	Keyboard (USB)	
Z1594A	Standard Waveform Pattern for Backup	DVD 5-disc set

 Table 1.2.3-1
 Applicable Parts (Cont'd)

1.2.4 Application software

For the latest information on the application software, either visit the MG3710A/MG3710E/MG3740A page on the Anritsu website or contact an Anritsu sales representative. Application software is sold separately.

Anritsu homepage: https://www.anritsu.com/

Table 1.2.4-1 lists examples of application software that are available for the MG3710A and MG3710E. Table 1.2.4-2 lists examples of application software that are available for the MG3740A (required to install option-020/120). They are all sold separately.

Option No.	Product Name	Remarks
MX370101A	HSDPA IQproducer™	
MX370102A	TDMA IQproducer TM	
MX370103A	CDMA2000 1xEV-DO IQproducer TM	
MX370104A	Multi-carrier IQproducer™	
MX370105A	Mobile WiMAX IQproducer TM	
MX370106A	DVB-T/H IQproducer™	CD-ROM containing a
MX370107A	Fading IQproducer TM	license and operation
MX370108A	LTE IQproducer TM	manual
MX370110A	LTE TDD IQproducer TM	
MX370111A	WLAN IQproducer TM	
MX370112A	TD-SCDMA IQproducer [™]	
MX370113A	$5G NR TDD sub-6GHz IQproducer^{TM}$	
MX370114A	$5 \mathrm{G} \ \mathrm{NR} \ \mathrm{FDD} \ \mathrm{sub} \ \mathrm{^{6}GHz} \ \mathrm{IQproducer^{\mathrm{TM}}}$	

 Table 1.2.4-1
 Application Software (MG3710A/MG3710E)

Table 1.2.4-2 Application Software (MG3740A installed option-02

Option No.	Product Name	Remarks
MX370102A	TDMA IQproducer TM	CD-ROM containing a
MX370107A	Fading IQproducer [™]	license and operation manual

Chapter 2 Preparation

This section describes items that you should know before using the MG3710A/MG3710E/MG3740A. Be sure to read this section at least once as it contains safety tips and cautions for avoiding equipment failure during use.

2.1	Installa	ation Location	2-2
	2.1.1	Installation orientation	2-2
	2.1.2	Distance from surrounding objects	2-3
	2.1.3	Installation location conditions	2-3
2.2	Items	to Check Before Use	2-4
	2.2.1	Safety labels	2-4
	2.2.2	Reverse power	2-4
	2.2.3	Electrostatic	2-5
2.3	Power	Connection	2-8
	2.3.1	Power requirements	2-8
	2.3.2	Connecting power cord	2-9

2.1 Installation Location

2.1.1 Installation orientation

Set the MG3710A/MG3710E/MG3740A horizontally as shown in the figure below.

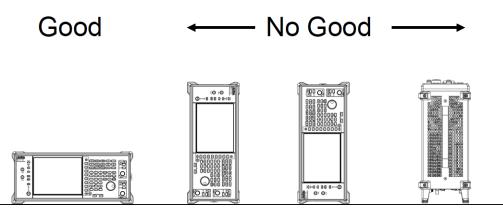


Figure 2.1.1-1 Installation Orientation



If the MG3710A/MG3710E/MG3740A is not installed in a "good" direction as above, a small shock may turn it over and harm the user.

2.1.2 Distance from surrounding objects

A fan is installed at the back of the MG3710A/MG3710E/MG3740A to prevent the internal temperature from rising. When installing the MG3710A/MG3710E/MG3740A, be sure to keep its sides at a distance of 10 cm or more from surrounding objects such as walls and peripheral units, to secure sufficient space around the fan.

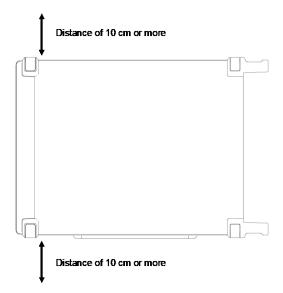


Figure 2.1.2-1 Distance From Surrounding Objects

2.1.3 Installation location conditions

The MG3710A/MG3710E/MG3740A can operate in locations with temperatures between 5°C and 45°C, but it should not be used in locations such as the following or failure may result.

- Location with a lot of vibration
- Location with high moisture or a lot of dust
- Location exposed to direct sunlight
- Location where exposure to active gases may occur
- Location where large fluctuations in power voltage occur

2.2 Items to Check Before Use

2.2.1 Safety labels

To ensure the safety of the operator, the WARNING labels shown below are affixed on the back panel, as shown. Be sure to observe the instructions on these labels.

M WARNING NO OPERATOR SERVICE- ABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.	 WARNING THIS MEASURING EQUIPMENT IS A PRECISION ELECTRONIC DEVICE THAT CONTAINS HAZARDOUS PARTS, AND THEREFORE MUST NOT BE SERVICED BY THE CUSTOMER. UNDER NO CIRCUMSTANCES DISASSEMBLE THIS EQUIPMENT. THIS EQUIPMENT MUST BE SERVICED
	ONLY BY QUALIFIED SERVICE PERSONNEL.

Figure 2.2.1-1 WARNING Label

2.2.2 Reverse power

The maximum reverse power input of the RF output connector of the MG3710A/MG3710E/MG3740A is as follows for both 1st RF and 2nd RF. Be careful not to apply reverse input power which exceeds the following. DC input

 $\pm 50 \text{ V DC Max}$

AC input

When both 1st RF and 2nd RF do not have the

Option-043/143/073/173 installed.

2 W (nominal)

When the Option-043/143/073/173 installed.

 $20 \text{ W} (1 \text{ MHz} < \text{Reverse input power frequency} \le 1 \text{ GHz}) (nominal)$

20 W (1 GHz < Reverse input power frequency \leq 2 GHz) (nominal)

 $10 \text{ W} (2 \text{ GHz} < \text{Reverse input power frequency} \le 6 \text{ GHz}) (nominal)$

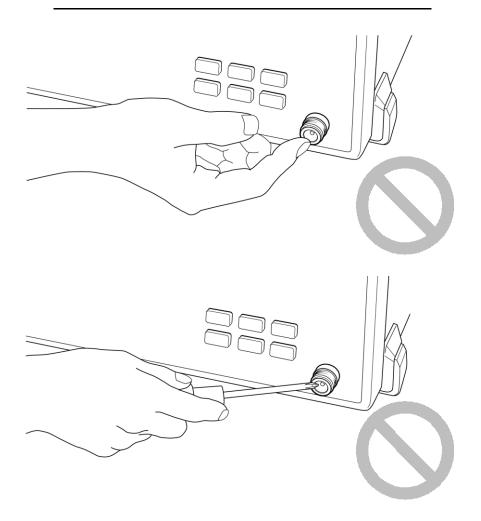
Installing the Option-043/143/073/173 (Reverse power protection) does not guarantee the protection from damages by reverse power. Be careful not to apply reverse power.

2.2.3 Electrostatic

 Always use the supplied 3-pin power cord to ground both the mainframe and DUT (included in test circuit). After confirming that both the mainframe and DUT are grounded, use coaxial cables to connect them.

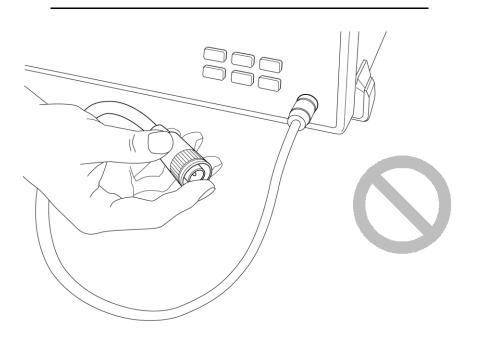
NEVER connect the mainframe and DUT without grounding, otherwise electrostatic discharge may damage the mainframe.

 Do not touch the core conductor of the coaxial cable connected to the input connector or bring it into contact with metal. Doing so may damage the input circuit of the mainframe.



Do not touch the core conductor to the metal when connecting the coaxial cable to the connector.

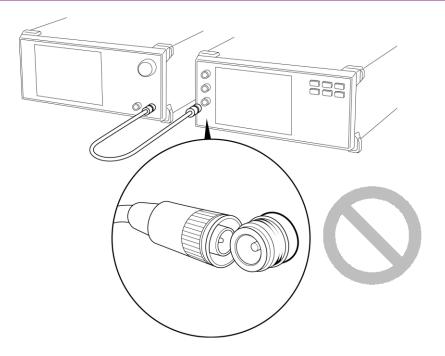
Doing so may damage the input circuit of the mainframe.





Do not touch the core conductor to the metal when connecting the coaxial cable to the connector.

Doing so may damage the input circuit of the mainframe.



2.3 Power Connection

This section describes the procedures for supplying power.

2.3.1 Power requirements

For normal operation of the instrument, observe the power voltage range described below.

Power supply	Voltage range	Frequency
100 Vac system	100 to 120 V	50 to $60~\mathrm{Hz}$
200 Vac system	200 to 240 V	50 to 60 Hz

Vac-system changeover is automatically made between 100 Vac and 200 Vac.



Supplying power exceeding the above range may result in electrical shock, fire, failure, or malfunction.

2.3.2 Connecting power cord

Insert the power plug into a grounded outlet, and connect the other end to the power inlet on the rear panel. To ensure that the instrument is properly grounded, always use the supplied 3-pin power cord.



Always connect the instrument to a properly grounded outlet. Do not use the instrument with an extension cord or transformer that does not have a ground wire.

If the instrument is connected to an ungrounded outlet, there is a risk of receiving a fatal electric shock. In addition, the peripheral devices connected to the instrument may be damaged.

Unless otherwise specified, the signal-connector ground terminal, like an external conductor of the coaxial connector, of the instrument is properly grounded when connecting the power cord to a grounded outlet. Connect the ground terminal of DUT to a ground having the same potential before connecting with the instrument. Failure to do so may result in an electric shock, fire, failure, or malfunction.

If an emergency arises causing the instrument to fail or malfunction, disconnect the instrument from the power supply by disconnecting either end of the power cord.

When installing the instrument, arrange the power inlet and outlet so that an operator may easily connect or disconnect the power cord. Moreover, DO NOT fix the power cord around the plug and the power inlet with a holding clamp or similar device.

If the instrument is mounted in a rack, a power switch for the rack or a circuit breaker may be used for power disconnection.

It should be noted that, the power switch on the front panel of the instrument is a standby switch, and cannot be used to cut the main power.

This chapter describes information you should know to operate the MG3710A/MG3710E/MG3740A, including names of parts and how to set basic parameters.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

3.1	Part N	ames
	3.1.1	Front panel3-2
	3.1.2	Rear panel
3.2	Power	On/Off
	3.2.1	Power on3-11
	3.2.2	Power off
3.3	Screer	۱ Layout
	3.3.1	Common indicator frame 3-16
	3.3.2	Frequency information frame
	3.3.3	Level information frame3-21
	3.3.4	Active function frame 3-22
	3.3.5	Function display frame3-23
	3.3.6	Resident frame 3-25
	3.3.7	Footer frame 3-26
	3.3.8	Function menu frame3-27
	3.3.9	Display of 2SG3-29
	3.3.10	RPP
3.4	Top Fu	unction Menu 3-32
	3.4.1	Modulation 3-33
	3.4.2	RF Output 3-34
	3.4.3	SG Port
3.5	Comm	on Setting Operations 3-36
	3.5.1	Specifying parameters as numeric values 3-36
	3.5.2	Setting character strings3-38
	3.5.3	Setting file names 3-40

3.1 Part Names

3.1.1 Front panel

This section describes the front-panel keys and connectors.

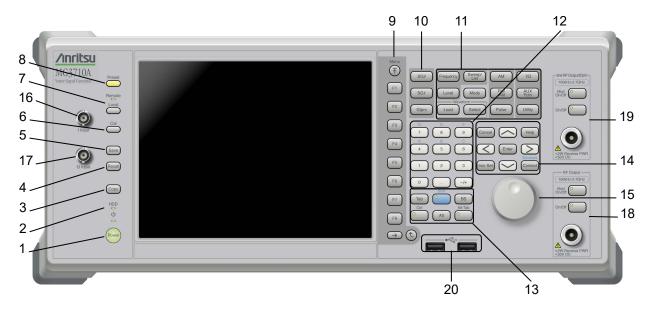
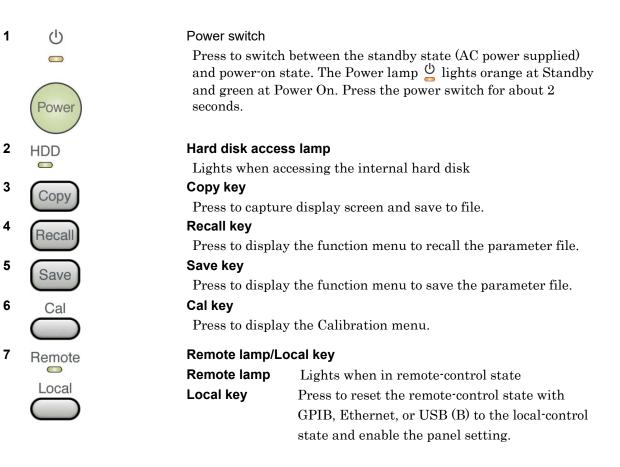
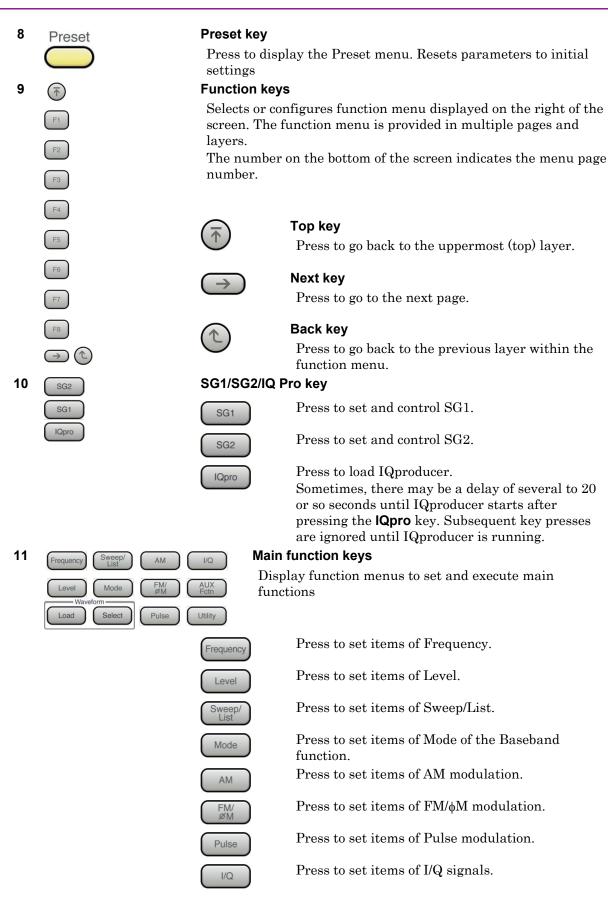


Figure 3.1.1-1 Front Panel



3.1 Part Names



12

13



Press to recall the Load function of ARB/Waveform function menu. Press to recall the Select function of ARB/Waveform function menu. Press to recall the Auxiliary function.



Press to recall the Utility function.

Numeric keypad

Enters numbers on parameter setup screens. [A] to [F] in hexadecimal formats can be entered by pressing



4 to 9 sequentially while 1 lights.

Tab/Alt/BS/Ctrl/Shift/Alt-Tab keys

Tab	Behaves same as the Tab key.
Alt	Behaves same as the Alt key.
BS	Press to delete the last entered digit or character.
Ctrl	Behaves same as the Ctrl key.
Shift	Operates keys with functions in blue characters on panel. Press the Shift key so the key lamp is green and then press the target key.
Alt-Tab	Alt-Tab key. Behaves same as the Alt key + Tab key.

14

Arrow keys/Enter/Cancel/Help/Incr Set/Context key

Arrow keys

Press to select items or change settings.



Context

Press to cancel the entered or selected data. Pressing this key while pressing a function key

displays the **Help** for the pressed function key. Press to set the entered or selected data.

Press to set a resolution for each parameter.

Context: Behaves same as right-click. Windows: Behaves same as pressing Windows key.



Rotary knob

Rotate the knob to select an item or change a setting. Spin faster to increase the amount of change.

3.1 Part Names





18





I Input connector

Inputs signals of I-phase when executing vector modulation of external baseband signals.

MG3740A is not equipped with this connector.

Q Input connector

Inputs signals of Q-phase when executing vector modulation of external baseband signals.

MG3740A is not equipped with this connector.

RF Output



Modulation control key

This command sets the SG1 Modulation On/Off. The lamp lights when RF signals are being modulated.



RF Output Control key

This command sets the SG1 Output On/Off. The lamp lights when RF signals are being modulated.

RF Output connector

Outputs RF signal.



Mod On/Off

2nd RF Output (Option)

Modulation control key

This command sets the SG2 Modulation On/Off. The lamp lights when RF signals are being modulated.



<2W Reverse PWR <50V DC

RF Output control key

This command sets the SG2 Output On/Off. The lamp lights when RF signals are being output.

RF Output connector

Outputs RF signal.



USB connector (type A)

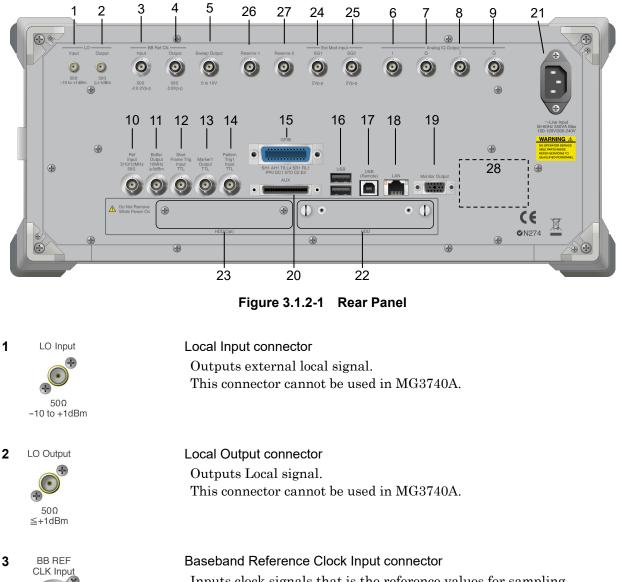
Connect the accessory USB keyboard, mouse or USB flash drive.



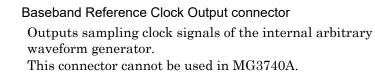


3.1.2 Rear panel

This section describes the rear-panel connectors.



Inputs clock signals that is the reference values for sampling clocks of the internal arbitrary waveform generator. This connector cannot be used in MG3740A.



4

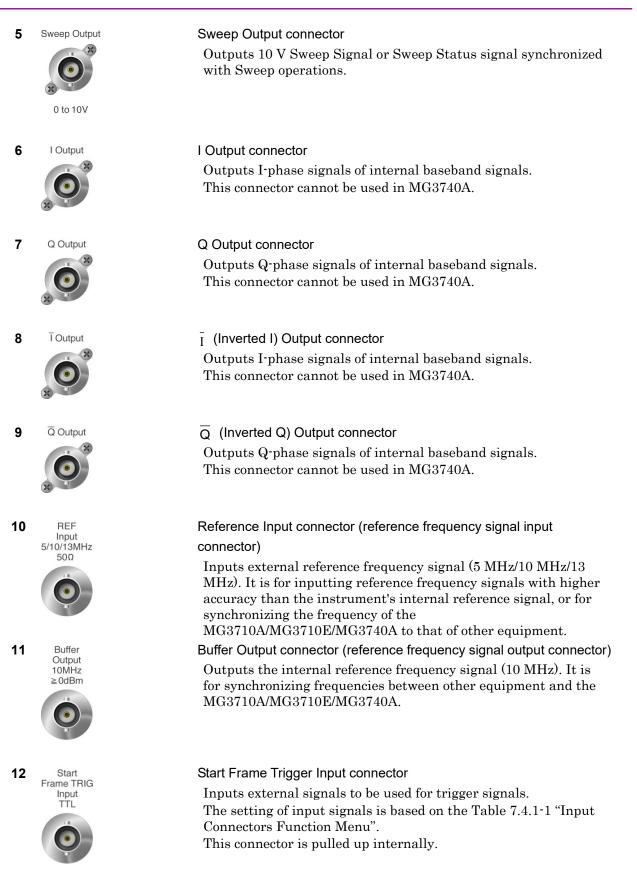
50Ω ≧0.2Vp-p

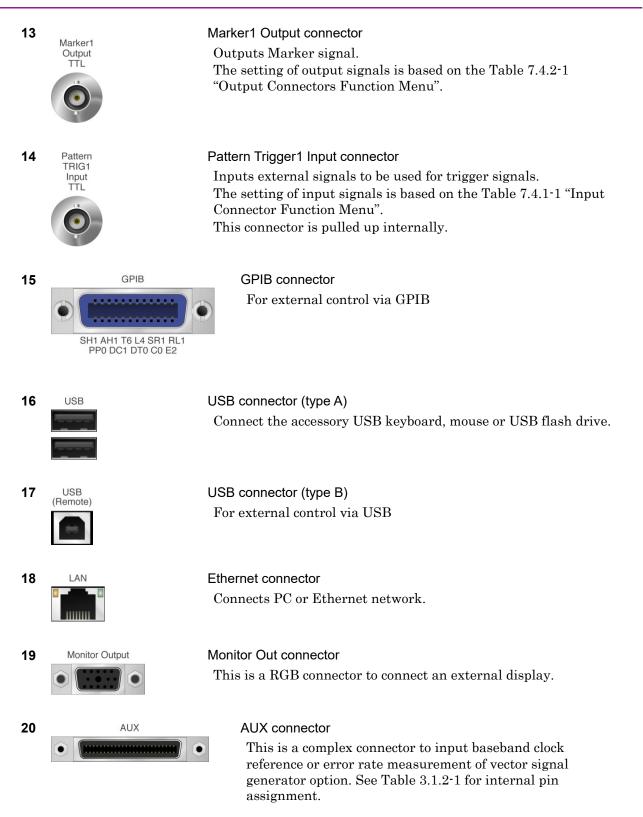
BB REF

CLK Output

50Ω 0.8Vp-p

3.1 Part Names





3.1 Part Names

21	Chine Input 50-60Hz 350VA Max 100-120V200-240V	AC inlet Supplies power.
22	HDD	HDD slot This is a hard disk slot.
23	HDD(Opt)	HDD slot for options This is a hard disk slot for the options.
24	SG1 2Vp-p	External Modulation Input SG1 connector This is an option connector for additional analog modulation input for the SG1.
25	SG2 2Vp-p	External Modulation Input SG2 connector This is an option connector for additional analog modulation input for the SG2.
26	Reserve 1	Reserve 1 Terminal for future extension
27	Reserve 2	Reserve 2 Terminal for future extension
28	Label	
	S/N	Serial number
	Opt.	Installed option number
	C1	Indicates that the operating system is WES7.
	RF1 E	For MG3710A, indicates that VSG1 Revision is 6 or later.
	RF2 E	For MG3710A, indicates that VSG2 Revision is 6 or later.

Function	Terminal No.	In/Out	Signal Name
SG	2	In	Pattern Status1 *2
	6		GND
	15	In	Pattern Trigger3/Pattern Status3 *2
	16		GND
	26		GND
	27	Out	Pulse Video
	28	Out	Pulse Sync
	29	Out	Sync Trigger Out
	31		GND
	36		GND
	38	Out	Marker 2
	39	Out	Marker 3
	40	In	Pattern Trigger2/Pattern Status2 *2
	41		GND
	42	In	Pulse Mod *1
	45		GND
BER	23		GND
	24	In	BER CLK *2
	48	In	BER Enable *2
	49	In	BER Data *2
	50		GND

Table 3.1.2-1 AUX Connectors

Because terminals not included in Table 3.1.2-1 are interfaces for maintaining equipment, do not connect them to any.

For signal setting details, refer to Table 7.4.1-1 "Input Connectors Function Menu" and Table 7.4.2-1 "Output Connectors Function Menu".

- *1: This connector is pulled down internally.
- *2: This connector is pulled up internally.

3.2 Power On/Off

3.2.1 Power on

The procedure for turning the power on is as follows:

- 1. Connect the jack-side end of power cord to the AC power inlet on the rear panel. Plug in the cord deep into the inlet.
- Connect the plug-side end of power cord to the AC power outlet. The MG3710A/MG3710E/MG3740A goes into the standby state, and lamp on the power switch lights orange.
- 3. When you press the power switch, the power turns on, and from lamp lights green, and loading starts. 🖉 lamp (orange) goes off.

When the power turns on, Windows starts, and then the software of the MG3710A/MG3710E/MG3740A starts. While it is starting, the start screen below is displayed. Do not press the power switch when the start screen is displayed. Pressing the switch may prevent the software from starting successfully.



Figure 3.2.1-1 Start Screen

3.2.2 Power off

The procedure for turning the power off is as follows:

To use panel keys to turn the power off:

• When you press the power switch, the applications start closing, shutdown starts, the lamp (green) of the power switch goes off, blamp lights orange, and the power turns off. The MG3710A/MG3710E/MG3740A goes into the standby state.

Note:

Do not press the power switch for more than 4 seconds. If you do so, a forced-end is performed when exiting the software.

To use the mouse connected to the MG3710A/MG3710E/MG3740A to turn the power off:

Other than Windows 10

1. Connect the mouse to the MG3710A/MG3710E/MG3740A, and open the Start menu on the Windows task bar.

Refer to 9.7.1 "Displaying Windows Desktop".

- 2. Select Shut down.
- 3. Select Shut down.
- 4. Shutdown starts, the Power lamp (green) of the power switch composes off, b lamp lights orange, and the power turns off. The MG3710A/MG3710E/MG3740A goes into the standby state.

Windows 10

- Connect the mouse to the MG3710A/MG3710E/MG3740A and open the Start Menu from the Windows Taskbar. Refer to 9.7.1 "Displaying Windows Desktop".
- 2. Select Power.
- 3. Select **Shut down**.
- Shutdown starts, the Power lamp (green) of the power switch (goes off, b lamp lights orange, and the power turns off. The MG3710A/MG3710E/MG3740A goes into the standby state.

To perform a forced-end:

• Press the power switch for more than 4 seconds. The Power lamp (green) of the power switch rever goes off, 😃 lamp lights orange, and the power turns off. The MG3710A/MG3710E/MG3740A goes into the standby state.

Notes:

- You should perform a forced-end as an emergency operation only when keys, mouse, or keyboard cannot be controlled for any reason. If you press the power switch for more than 4 seconds, and the power does not turn off, a failure may have occurred. Unplug it, and contact an Anritsu Service and Sales office.
- Unplugging while you are accessing to the hard disk may cause a failure of the hard disk. You must unplug the MG3710A/MG3710E/MG3740A when the power is off.

Restoring parameters

After the power on, parameters are restored to the state of the last time the power was off or the state of defaults setting.

3.3 Screen Layout

After the power turns on and Self Check completes, the basic screen (Figure 3.3-1) is displayed.

1SG:

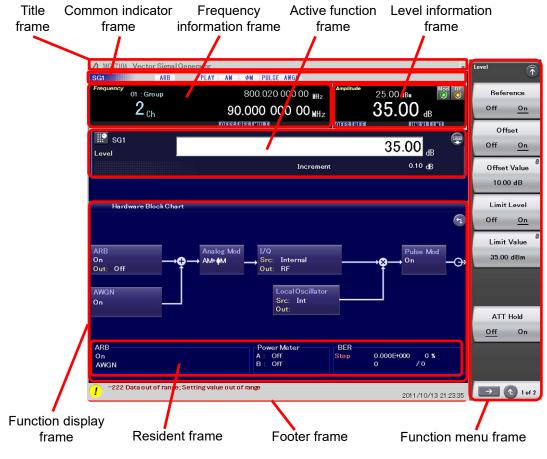


Figure 3.3-1 Basic Screen (1SG)

Title frame

Displays a model, name (Vector Signal Generator/Analog Signal Generator), and window-minimize switch.

Common indicator frame

Displays the status of SG common settings.

Frequency information frame

Displays the information of frequencies.

Level information frame

Displays the information of levels.

Active function frame

Displays input dialog boxes for setting parameters.

Function display frame

Displays the current setting of SG in a block diagram and displays necessary information for each function.

Resident frame

Displays Power Meter and measured results of BER.

Footer frame

Displays error messages, error information, and the current time.

Function menu frame

The function menu frame on the right-side of the screen displays the function menu. The content depends on a screen.

2SG:

Displays 2SG-specific functions.



Figure 3.3-2 Basic Screen (2SG)

Summary frame

Displays the information of uncontrolled SG frequencies, levels, output status, and alarms.

3.3.1 Common indicator frame

The common indicator frame displays indicators described in Table 3.3.1-1 and Table 3.3.1-2 to indicate the current status.

Indicator Display		Description	
Alarm information	May be displayed even when there is no error.		
ALC	ALC Auto Level Control	Indicates that the output level may not have been reached a certain value.	
BBDAC	BBDAC Baseband Digital to Analog Converter	Indicates that clipping occurred in Baseband DAC or the digital block due to overflow.	
OVENCOLD	OVEN COLD	Indicates that the internal reference oscillator frequency may not be stable within three minutes after the power is turned on.	
Alarm information	n Displayed for errors.		
UNLOCK		Indicates that Baseband Reference Clock is not synchronized, that the internal reference oscillator has stopped synchronizing after 3 minutes or more since the power is turned on, or that the external reference oscillator is not synchronized.	
EXTMOD	EXTMOD	Indicates that the level of signal input to the External Modulation Input connector is greater than 2.03 Vp-p.	

 Table 3.3.1-1
 Common Indicators Alarm Information

For handling when the alarm information is displayed, refer to 11.6 "Troubleshooting".

ALC Alarm

Remote command

Query the status of ALC

Query

[:SOURce[1]|2]:POWer:ALC:ERRor?

Response

<status>

Parameter

<status></status>	Status
ALAR	Alarm
NORM	Normal

Programming Example

To query the status of ALC. POW:ALC:ERR? > NORM

BBDAC Alarm

Remote command

Query the status of BBDAC

Query [:SOURce[1]|2]:DM:DAC:ERRor?

Response

<status>

Parameter

<status></status>	Status
CLIP	Clipped
NORM	Normal

Programming Example

To query the status of BBDAC. DM:DAC:ERR? > NORM

UNLOCK Alarm

Remote command	UNLOCK: Query the status of Baseband Reference Query	
	[:SOURce[1] 2]:RADio:ARB:CLOCk:REFerence:ERRor?	
	Response	
	<status></status>	
	Parameter	
	<status></status>	Status
	LINT	Lock BB Int Clock
	UINT	Unlock BB Int Clock
	LEXT	Lock BB Ext Clock
	UEXT	Unlock BB Ext Clock
	Programming Exam	ple

To query the status of Baseband Reference. RAD:ARB:CLOC:REF:ERR? > LINT

UNLOCK/OVEN COLD Alarm

Remote command	UNLOCK/OVEN COLD: Query the status of the reference oscillator Query [:SOURce]:ROSCillator:STATus?	
	Response	
	<status></status>	
	Parameter	
	<status></status>	Status
	0	Lock
	1	Unlock
	2	Oven Cold

Programming Example

To query the status of the reference oscillator. ROSC:STAT?

> 2

EXTMOD Alarm

 Remote command
 EXTMOD: Check the external modulation input for "clipping" caused by overflow.

 Query
 [:SOURce[1]|2]:EXTMod:ERRor?

 Response
 <boolean>

 <boolean>
 NORM (Normal) or CLIP (Clipping)

 Programming Example
 To check the external modulation input for "clipping" caused by overflow.

 EXTM:ERR?
 EXTM:ERR?

> NORM

Status information	n	
ARB	ARB	Indicates that the ARB function is being used.
SWEEP	SWEEP	Indicates that the SWEEP function is being used.
AM	AM	Indicates AM modulation is being executed.
FM	FM	Indicates FM modulation is being executed.
ФM	φM	Indicates ϕM modulation is being executed.
PULSE	PULSE	Indicates Pulse modulation is being executed.
CORR	CORR User Correction	Indicates that the User Correction function is on.
AWGN	AWGN Additive White Gaussian Noise	Indicates AWGN signals are being output.
PLAY	PLAY	Indicates waveform patterns are being output.
WAIT	WAIT	Indicates waveform patterns has stopped.
WIDE	WIDE Wideband	Indicates that the bandwidth characteristic of RF output is Wideband mode.
INTCORR	INTCORR Internal Channel Correction	Indicates that correction in the baseband bandwidth is enabled.

Table 3.3.1-2 Common Indicator Status Information

3.3.2 Frequency information frame

The frequency information frame displays the information of frequencies.

There are two modes: frequency display and channel display. Refer to Chapter 4 "Frequency".



Figure 3.3.2-1 Frequency Information Frame (Frequency Display)



Figure 3.3.2-2 Frequency Information Frame (Channel Display)

3.3.3 Level information frame

The level information frame displays the information of levels. Refer to Chapter 5 "Output Level".



Figure 3.3.3-1 Level Information Frame

3.3.4 Active function frame

On the active function frame, you can enter numbers and characters for setting all parameters. When you select a parameter on the function menu, a dialog box is displayed. This frame is not displayed when there is no parameter to be set or when it is in the remote-control state.

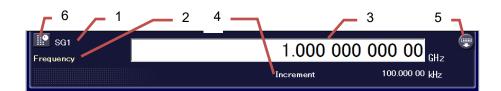


Figure 3.3.4-1 Numeric Input Dialog Box



Figure 3.3.4-2 Character Input Dialog Box (Except for File Names)

	ChTable_20110714_0000	
Channel Table Save		



- 1. SG number Displays SG1 or SG2 to be set.
- 2. Function name Displays a function name to be set.
- 3. Text box Inputs or changes numeric values or character strings to be set.
- Increment Displays a unit of step for setting with rotary knob or arrow keys.
- Touch panel display switch Displays a touch panel for input. Refer to 3.5.1 "Specifying parameters as numeric values" and 3.5.2 "Setting character strings".
- Rotary knob switch Enables/locks the rotary knob. Refer to 3.5.1 "Specifying parameters as numeric values".

7. Character pallet

Displays available characters. The character selection cursor and the mouse can be used for input.

Refer to 3.5.2 "Setting character strings".

Note:

Character types available for file names and for names other than file names are different.

3.3.5 Function display frame

The function display frame displays the information of each function and setting in block diagrams and controls on the screen. This is not displayed in the remote-control state.

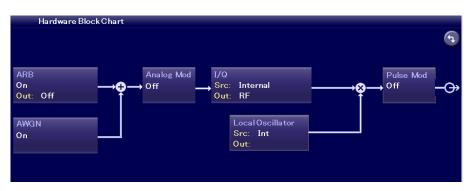


Figure 3.3.5-1 Function Display Frame Example

Hardware Block Chart

Displays the setting of the MG3710A/MG3710E/MG3740A, signal flow, and the current I/O setting status.

ARB Info

Shows the current waveform output status.

Sweep/List Info

Shows the setting status and progress of Sweep and List function.

BER

Shows the BER measurement status.

Table

Includes the channel table, correction table, and list table.

List

Includes the waveform file list, BER Log, and Alarm History.

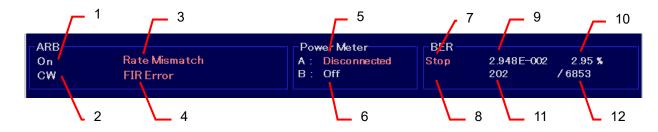
The following keys can be used for creating and editing lists and tables.

 Table 3.3.5-1
 Keys Available for Creating and Editing Lists and Tables

Key name	Function
Rotary knob	Clockwise
	Moves the cursor from the left top to the right
	bottom sequentially.
	Counter clockwise
	Moves the cursor in reverse to the above.
$\langle \rangle$	Moves the cursor horizontally.
	Moves the cursor vertically.
Enter key	Opens the setting dialog box of the item selected with the
	cursor.
Cancel key	Cancels the entered value and closes the setting dialog
	box.

3.3.6 Resident frame

The resident frame displays parameters of ARB, Power Meter, BER setting, and measured results.





ARB (Refer to Table 7.1.1-2 "Resident Display Frame ARB".)

- 1 ARB On/Off information
- 2 Displays the combination of the waveform memory, CW, AWGN, and others output from ARB.
- 3 Rate Mismatch display
- 4 FIR Error display

Power Meter

- 5 A: On/Off/Disconnect information/Measured value
- 6 B: On/Off/Disconnect information/Measured value

BER Test

- 7 Status Stopped Sync Measuring
 8 Error Clock ERR (Input clock error) Enable ERR (Input enable signal error) Sync Loss (Sync Loss occurred)
 9 Rate An index is displayed.
- 10 Rate % display
- 11 Count Error count
- 12 Count Measured bits

Chapter 3 Operation

3.3.7 Footer frame

The footer frame displays reasons and time of error messages or error information of indicators.



Figure 3.3.7-1 Footer Frame

- 1 Displays the error message ID.
- 2 Displays the error message.

(Ex: Data out of range)

3 Displays the error information (cause of the error).

(Ex: Setting value out of range)

4 Displays the current time.

For explanations of error messages, refer to Appendix B "Error Messages".

3.3.8 Function menu frame

The function menu frame is displayed on the right side of the screen and contains the following items. Items on the menu depend on the screen.

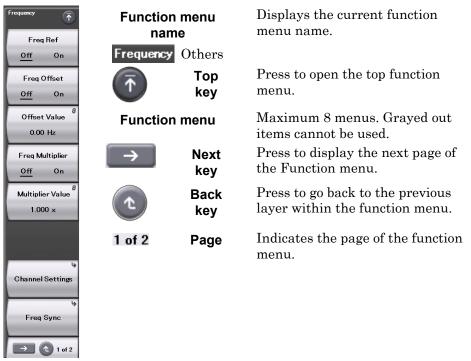


Figure 3.3.8-1 Function Menu

The symbol on the upper right of each function menu key represents a behavior when pressing the function key. The meanings of each symbol are explained below.

• Press the soft function key to display the function menu on the next layer.



Figure 3.3.8-2 Function Key with 🎍 Symbol

Function key without a symbol.

There are 2 types.

The function key with multiple options: Each time you press the function key, the underline of option moves in the function menu.



Figure 3.3.8-3 Function Key without a Symbol

The function key to execute operation immediately:

Press the soft function key to execute the menu immediately. The display does not change.



Figure 3.3.8-4 Function Key without a Symbol

• Press the soft function key to display an input dialog box in the active function frame.

SG1 Offset Value					0.00 _{Hz}	
			Increment		100.000 00 KHz	
	 	Function	Ney with	8	Symbol	

3.3.9 Display of 2SG

When two SGs are installed, SG that is not selected for control is displayed in the summary frame as below. The figure below shows the summary frame when SG2 is not selected.

			2	3	4
SG2	1.000 000	000 00 GHz	0.00 dBm	Mod BF	UNLOCK
	Fi	gure 3.3.9-1 Sumr	mary Frame		
		l frequency the specified frequ	ency. The relative	e display or the	e value
:	with the	offset is displayed. I output level	·		
:		the specified outpu t is displayed. atus	it. The relative di	splay or the va	alue with
	Displays Mod	the RF output stat When it lights gree modulated.		t signals are	
	RF 4 Alarm	When it lights ora		-	
	Displays	the alarm information	tion of the commo	n indicator on	ly.

3.3.10 RPP



Figure 3.3.10-1 RPP Message

RPP (Reverse Power Protection) is a function to protect the internal circuit of the MG3710A/MG3710E/MG3740A against the reverse input signals. When the external high level RF signal is input to the RF Output terminal, the excessive reverse input is blocked by the relay circuit to prevent from being input to the MG3710A/MG3710E/MG3740A.

The RPP function is available only when the Option 043/143 and 073/173 are installed.

When the RPP function has worked, the message above is displayed. The RPP function menu is displayed, too.

Table 3.3.10-1 RPP Function Menu

Page	Key No.	Menu Display	Function
1	F1	Resume SG1&SG2 RPP	Unblocks signals and recovers to the normal operation if RPP blocks signals.

Remote command

Cancel the signal-block executed by RPP

Command

:OUTPut:PROTection:RESume

Details

This command recovers both SG1 and SG2.

Programming Example

To cancel the signal-block executed by RPP. OUTP:PROT:RES

3.3 Screen Layout

Remote command	Query RPP Status	6
	Query	
	:OUTPut[1] 2:P	PROTection:ERRor?
	Response	
	<boolean></boolean>	
	Parameter	
	<boolean></boolean>	RPP Status
	0	RPP does not block signals.
	1	RPP blocks signals.
	Programming Exa	ample
	To query RPP Sta	
	OUTP:PROT:ERR?	
	> 1	
Remote command	Query the count o	of RPP
	Query	
	:OUTPut[1] 2:P	ROTection:COUNt?
	Response	
	<integer></integer>	Count of RPP
	Range	0 to $4294967295 (=2^{32} - 1)$
	Resolution	1
	Programming Exa	ample
	To query the RPP	
	OUTP2:PROT:COU	
	> 10	
	> 10	

3.4 Top Function Menu

Press $\textcircled{\tiny Menu}{\hline}$ to display the top function menu.

Page	Key No.	Menu Display	Function					
1	F1	Frequency	Displays the Frequency function menu. Refer to Chapter 4 "Frequency"					
	F2	Level	Displays the Level function menu. Refer to Chapter 5 "Output Level					
	F3	Sweep/List	Displays the Sweep/List function menu. Refer to Chapter 6 "Sweep/List"					
	F4	Mode	Displays the Mode function menu. Refer to Chapter 7 "Modulation"					
	F6	Modulation <u>Off</u> On	Turns On/Off the RF signal modulation. When Off is selected, carrier waves (CW) are output. Refer to 3.4.1 "Modulation"					
	F7	RF Output <u>Off</u> On	Enables/disables the RF signal output. Refer to 3.4.2 "RF Output"					
	F8	$\begin{array}{c} \text{SG Port} \\ \underline{1} & 2 \end{array}$	Selects the SG to be controlled. Refer to 3.4.3 "SG Port"					
2	F1	AWGN	Displays the AWGN function menu. They are not displayed in MG3740A Refer to 7.5 "AWGN"					
	F2	I/Q	Displays the I/Q function menu. Refer to 7.6 "I/Q Modulation".					
	F3	Analog/Pulse	Displays the Analog/Pulse function menu. Refer to 7.2 "Analog Modulation: Analog/Pulse".					
	F4	Route Connectors	Displays the Route Connectors function menu. Refer to 7.4 "Route Connectors".					
	F5	Auxiliary	Displays the Auxiliary function menu. Refer to 9.1 "Auxiliary Function".					
	F6	Utility	Displays the Utility function menu. Refer to 9.4 "Utility Function".					

Table 3.4-1 Top Function Menu

3.4.1 Modulation

Mod on/Off or Top>Modulation

Turns On/Off the RF signal modulation .

Press **F6 Modulation** to set the SG output signal modulation to On/Off. This behaves same as **Mod On/Off** on the front panel.

Off	Turns the modulation of SG output signals Off
	(no modulation, Default).
On	Modulates SG output signals. The Mod On/Off
	LED (green) on the front panel and "Mod" of the
	output status (green) in the level information
	frame light.

Remote command Togg

Toggle On/Off RF signal modulation

Command

:OUTPut[1]|2:MODulation[:STATe] <boolean>

Query

:OUTPut[1]|2:MODulation[:STATe]?

Response

<boolean>

0 or 1

Parameter

<boolean> OFF|0 ON|1 Modulation On/Off Modulation Off (Default) Modulation On

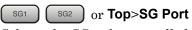
Programming Example

To turn the modulation On. OUTP:MOD ON OUTP:MOD? > 1

RF Output 3.4.2 on/off or Top>RF Output Enables/disables the RF signal output. Press F7 RF Output to turn the output of SG signals On/Off. When RF Output is On, the **SG On/Off** LED (yellow) on the front panel and "RF" display of the output status (yellow) in the level information frame light. This behaves same as **RF On/Off** on the front panel. Off Stops outputting RF signals (Default). On Outputs RF signals from the connector on the front panel. The **SG On/Off** LED (yellow) on the front panel and "RF" display of the output status (yellow) in the level information frame light. **Remote command** Toggle On/Off RF signal output Command :OUTPut[1]|2[:STATe] <boolean> Query :OUTPut[1] |2[:STATe]? Response <boolean> 0 or 1 Parameter <boolean> Output On/Off OFF | 0 **Output Off (Default)** ON | 1 Output On **Programming Example** To turn the output On. OUTP ON

OUTP? > 1

3.4.3 SG Port



Selects the SG to be controlled.

Press **F8 SG Port** to select SG to be controlled. This is available when SG2 (Option 062/162, 064/164, 066/166) is installed. These behave same as **SG1** and **SG2** on the front panel.

- 1 Controls SG1 (Default).
- $\mathbf{2}$ Controls SG2.

Remote command

Select SG to be controlled Command

[:SOURce]:PORT 1|2

Query

[:SOURce]:PORT?

Response

<port>

Parameter

<port></port>	Controlled
1	SG1 (Default)
2	SG2

Programming Example

To control SG2. PORT 2 PORT? > 2

3.5 Common Setting Operations

This section describes basic operations common to each screens.

3.5.1 Specifying parameters as numeric values

When you press a function key, the active function frame displays a numeric input dialog box where you can set parameters such as frequencies or output levels.



Figure 3.5.1-1 Numeric Input Dialog Box

A text box for numeric input is displayed in the upper part of the dialog box, while the increment step specified with rotary knob or arrow keys is displayed in the lower part.

The touch panel or the numeric keypad can be used for numeric input.

To input a numeric value using the touch panel:

The display of the MG3710A/MG3710E/MG3740A is a touch panel. Press the arrow key on the upper right of the numeric input dialog box to display the numeric keypad panel. Touch a number on the display to input the value. You can also enter a number by clicking it with a mouse.

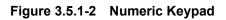


Displays the numeric keypad panel.



Hides the numeric keypad panel.

SG1 Frequency	1.000 000 000 000 GHz Increment 100.000 kHz								
	7	,	8	9					
	4	-	5	6					
	1		2	3					
	C			-					



To input a numeric value using the numeric keypad:

When you enter a numeric value using the numeric keypad, the value you entered is displayed in the text box. After inputting a numeric value, press the **Enter**, **Enter Item**, or unit key on the function menu to finalize it. When you press **Cancel** during the input process, the entered value becomes invalid and returns to the state before your input.

To increase/decrease a numeric values using the rotary knob: Select a highlighted resolution using an arrow key (), and then rotate the rotary knob to the right to increase the digit. Rotate the rotary knob to the left to decrease the digit. Rotating the rotary knob specifies a number in real time.

Note:

The rotary knob has the lock function to avoid a misoperation. Pressing the lock key on the upper left allows you to lock the rotary knob. This function can be set only from the screen.



Enables the rotary knob.



Locks the rotary knob.



Figure 3.5.1-3 Locked Rotary Knob

To increase/decrease a numeric values using arrow keys:

Increase/decrease a numeric value using OC. The step in which a numeric value is increased/decreased each time a step key is pressed varies according to the parameter. Handling arrow keys specifies a value in real time.

3.5.2 Setting character strings

When you set a character string, the active function frame displays a dialog box to input character strings.

When you enter Group Name, the **Group Name** dialog box is displayed.

Group Name			802.11	802.11b										
			ab	cdefg	H I J K L M N O P Q R S T U h i j k l m n o p q r s t u 7 8 9 ! # \$ % & () + - = _	v w x y z ; 👬 " < >								
<u> </u>														
		Channel Table												
		Group Name	Start	End	Start Frequency	Channel Spacing								
•	01		Start 0	End 0	Start Frequency 800.00000000 MHz	Channel Spacing 16.00000 KHz								
•		Group Name					1							

Figure 3.5.2-1 Character String Input Dialog Box

A text box for character string input is displayed in the upper part of the dialog box, while the character pallet containing available characters is displayed in the lower part. You can enter characters by directly clicking on the character pallet with the mouse.

Press the arrow key on the upper right of the numeric input dialog box to display the character string input panel. Touch a character on the display to input it. You can also enter a character by clicking it with the mouse.



Displays the character string input panel.

Hides the character string input panel.

àroup											-				
A	В	С	D	E	F	G	Н	Ι	J	Κ	L	Μ	Ν	0	Ρ
Q	R	S	Т	U	۷	W	Х	Y	Ζ	а	b	С	d	е	f
g	h	i	j	k	I	m	n	0	Р	q	r	S	t	u	v
w	х	У	z	0	1	2	3	4	5	6	7	8	9	!	#
\$	%	&	()	+	—	=	_	Ε]	^	{	}	,	
@	Ι	"	;	,	~	<	>	/	:	*	?				

Figure 3.5.2-2 Character String Input Panel

Keys available for character string input are as follows:

 Table 3.5.2-1
 Keys Available for Character String Input

Key name	Function
Rotary knob	Moves character string input pallet/panel character selection cursor horizontally
Arrow keys,	Moves character string input text box input cursor horizontally
Numeric keypad	Directly inputs numbers (from 0 to 9), ".", and "-". After pressing Shift , you can input alphabets (from A to F).
Enter	Inserts the character selected by the character selection cursor on the position where the input cursor locates.
BS	Deletes the character before the input cursor.
Cancel	Stops inputting character strings and closes the window.

Notes:

- The maximum of 100 characters can be input as character strings.
- Characters available for character strings are displayed on the character pallet.
- The following characters cannot be used:

3.5.3 Setting file names

When a file name such as a channel table must be set, the active function frame displays a dialog box to input file names, for example **Channel Table Save** dialog box.

	ChTable_20111013_002	
Channel Table Save	▲ B C D E F G H I J K L M N O P Q R S T U V W X Y Z , . @ a b c d e f g h i j k l m n o p q r s t u v w x y z ; ' " 0 1 2 3 4 5 6 7 8 9 ! # \$ % & () + - = [] ^ { }	
File List		
Path : C:¥Anritsu¥MG3710A	¥User Data¥ChannelTable¥	
Name		^
ChTable.ch ChTable_20110720_0000 ChTable_20110720_0001 ChTable_20111013_00.2 LastChTable LastChTable2 LastParameterSetting_chann LastParameterSetting_chann Param_20110920_000_channel	elSg2 ISg1	E
Param 20110920.000_channel Param 20111.005_011_channe Param 20111.005_011_channe Param 20111.007_012_channe Param 20111.007_012_channel Param 20111005_001_channel Param 20111005_001_channel	ISg1 ISg2 ISg2 ISg2 ISg2 ISg1 ISg2	
Param_20111005_0010_channe 44 files found.	310gi	Ŧ

Figure 3.5.3-1 File Name Input Dialog Box

A text box for character string input is displayed in the upper part of the dialog box, while the character pallet containing available characters is displayed in the lower part.

You can also enter characters by directly clicking it on the character pallet with the mouse.

Refer to Table 3.5.2-1 "Keys Available for Character String Input" for keys available for character string input.

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Example of a destination path: Anritsu\MG3710A\User Data\XXXXX\
- Example of a default destination name: XXXXXX_[Date]_[Additional number].xxx The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist. XXXXXX and xxx depend on file types.

- Characters available for file names are displayed on the character palette.
- The following characters cannot be used: (/ : * ?) / < >)
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Chapter 3 Operation

This chapter describes the functions for setting frequencies.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

4.1	Freque	ency	4-2
	4.1.1	Display description	4-3
	4.1.2	Frequency indicator	4-4
4.2	Freque	ency Setting Method: Frequency	4-6
	4.2.1	Frequency setting with numeric keypad	4-7
	4.2.2	Changing frequencies with rotary knob	4-8
	4.2.3	Changing frequencies with arrow keys	4-9
	4.2.4	Frequency setting resolution	4-10
4.3	Freque	ency Setting Items	4-12
	4.3.1	Frequency relative display: Freq Ref	4-14
	4.3.2	Frequency offset	4-16
	4.3.3	Frequency offset multiplier	4-18
4.4	Chann	el Setting	4-20
	4.4.1	Frequency/channel display: Display	4-21
	4.4.2	Frequency display: Frequency	4-22
	4.4.3	Channel selection: Channel	4-23
	4.4.4	Channel Group	4-25
4.5	Chann	el Table: Edit Table	4-26
	4.5.1	Registering channel groups	4-28
	4.5.2	Adding channel groups: Insert Row	4-33
	4.5.3	Deleting channel groups: Delete Row	4-34
	4.5.4	Deleting channel tables: Clear	4-35
	4.5.5	Recalling channel tables: Open	4-36
	4.5.6	Saving channel tables: Save	4-38
4.6	Freque	ency-Related Functions	4-41
	4.6.1	Frequency synchronization: Freq Sync	4-41
	4.6.2	Phase noise optimization: Phase Noise	
		Optimize	4-44
	4.6.3	Spectrum reverse: RF Spectrum	4-45
	4.6.4	Reference oscillator	4-47
	4.6.5	Local signal source	4-49
	4.6.6	Ref Clock Adjustment	4-53

4.1 Frequency

(Frequency) or Top>Frequency

When you press **Frequency** of the main function key or **F1 Frequency** on the top function menu, the MG3710A/MG3710E/MG3740A becomes the frequency setting mode and the **Frequency** or **Channel** dialog box is displayed in the active function frame. The Frequency function menu is displayed, too.

This chapter assumes that you press **Frequency** or **F1 Frequency** on the top function menu and the MG3710A/MG3710E/MG3740A is in the frequency setting mode, unless otherwise specified.

Frequency setting range and resolution

Frequency setting range

9 kHz to 2700 GHz (With MG3710A/MG3710E/MG3740A-032)
9 kHz to 4000 MHz (With MG3710A/MG3710E/MG3740A-034)
9 kHz to 6000 MHz (With MG3710A/MG3710E/MG3740A-036)
9 kHz to 2700 MHz (With MG3710A/MG3710E/MG3740A-062/162)
9 kHz to 4000 MHz (With MG3710A/MG3710E/MG3740A-064/164)
9 kHz to 6000 MHz (With MG3710A/MG3710E/MG3740A-066/166)

Frequency setting resolution 0.01 Hz

A frequency out of the range cannot be set or finalized, and the error screen is displayed.

Frequency setting methods are as follows:

- Frequency setting with the numeric keypad
- Frequency setting with the rotary knob
- Frequency setting with step keys

4.1.1 Display description

This section describes screens of the frequency information frame.

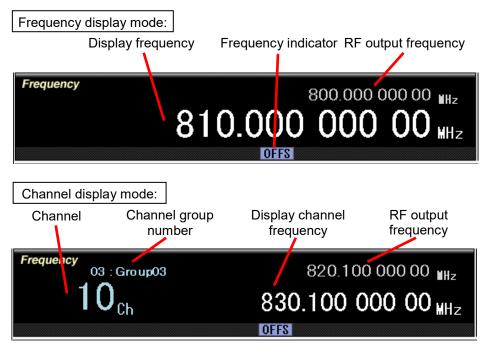


Figure 4.1.1-1 Frequency Setting Screen

Table 4.1.1-1	Items of Frequency Setting Screen
---------------	-----------------------------------

Display	Description	
Display frequency	Indicates the specified frequency.	
	A value is changed by enabling/disabling Freq Ref or Freq Offset.	
RF output frequency	Indicates the actually output frequency.	
Channel	Indicates the currently selected channel number.	
Channel group number	Indicates a number of the channel group.	
Display channel frequency	Indicates the frequency corresponding to the channel number.	
Frequency indicator	Indicates the status of frequency setting.	

4.1.2 Frequency indicator

Items of frequency indicators are as follows:

Display Name		Description	
Offset Offset Indicates that the frequency offset function is on.		Indicates that the frequency offset function is on.	
REF	Reference	Indicates that the frequency relative value display function is on.	
MULT	Multiplier	Indicates that the frequency offset multiplier function is on.	
OSYNCOffsetof SGs is out of the specified range cannot be synchronized when freq		Indicates that the frequency of either one of SGs is out of the specified range and cannot be synchronized when frequency synchronization is executed for SG1 and SG2.	
EXTREF	Reference	Indicates that an external signal is used as a reference signal source.	

Table 4.1.2-1 Frequency Indicator

Remote commands for items in the frequency indicator frame are as follows:

Out of specified range: OSYNC

Remote command OSYNC: Query the status of frequency synchronization for SG 1 and SG2 Query [:SOURce[1]|2]:FREQuency:SYNC:STATus?

Response

<status>

Parameter

ROSC:SOUR? > INT

<status></status>		Synchronization of frequencies
OOS	Out of	Cannot synchronize frequencies because it
	Sync	stands out of the specified range.
NORM	Normal	Normal

Programming Example

To query the information of frequency synchronization for SG1 and SG2. FREQ:SYNC:STAT? > NORM

External reference signal: EXTREF

Remote command	EXTREF: Query the setting of the reference oscillator Query [:SOURce]:ROSCillator:SOURce?	
	Response	
	<status></status>	
	Parameter	
	<status></status>	Status
	When the language	e mode is SCPI/MG3700:
	INT	Internal reference signal source
	EXT	External reference signal source
	When the language	e mode is MS269X/MS2830:
	INT	Internal reference signal source
	INTU	Internal reference signal source (Unlock state)
	EXT	External reference signal source
	EXTU	External reference signal source (Unlock state)
	Programming Exa	mple
	• •	g of the reference oscillator.

4.2 Frequency Setting Method: Frequency

Frequency or Top>Frequency

When you press **Frequency** of the main function key or **F1 Frequency** on the top function menu, the MG3710A/MG3710E/MG3740A becomes the frequency setting mode and the **Frequency** dialog box is displayed in the active function frame. Enter numbers in the **Frequency** dialog box to set frequencies.

Remote command

Set Frequencies

Command

[:SOURce[1]|2]:FREQuency[:CW|:FIXed] <freq>

Query

[:SOURce[1]|2]:FREQuency[:CW|:FIXed]?

Response

<freq>

Unit: Hz

Parameter

<freq> Range Resolution Default Suffix code Frequency Refer to 4.1 "Frequency". 0.01 Hz 1 GHz HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ When omitted Hz

Programming Example

To set the frequency to 800 MHz. FREQ 800MHZ FREQ? > 80000000.00

4.2.1 Frequency setting with numeric keypad

Enter numbers in the Frequency dialog box.

Setting method

The procedure for setting frequencies with the numeric keypad is as follows.

Example: To set the frequency to 360.3 MHz

1. Press "**3**", "**6**", "**0**", ".", and "**3**" using number buttons of the numeric keypad or numbers on the screen. The screen below is displayed.





 Press the unit F2 MHz on the function key to finalize the numbers and the unit. The "360.300 000 00 MHz" is displayed in the Frequency dialog box and in the frequency information frame.





360.3 MHz can be also set using one of the following:

- "0", ".", "3", "6", "0", "3", F1 GHz
- "3", "6", "0", "3", "0", "0", F3 kHz
- "3", "6", "0", "3", "0", "0", "0", "0", "0", F4 Hz

Digits of 0.01 Hz or smaller are truncated.

4.2.2 Changing frequencies with rotary knob

The rotary knob allows you to increase or decrease a digit of resolution selected by arrow keys

Default value of the digit of resolution (the position of the cursor): 0.01 Hz.

Setting method The procedure for setting frequencies with the rotary knob is as follows:

Example: To change the frequency from 360.3 MHz to 360.7 MHz by 100 kHz.

Use the arrow keys to place the cursor on the digit of 100 kHz.



Figure 4.2.2-1 Frequency Dialog Box

Rotate the rotary knob to the right to increase a frequency by 100 kHz step. Rotate it to the left to decrease the frequency by 100 kHz. Using this method, rotate the rotary knob to the right and specify the frequency to 360.7 MHz.

4.2.3 Changing frequencies with arrow keys

Arrow keys enable you to increase or decrease a digit of resolution selected by arrow keys . The cursor shows the position of the digit.

Default value of frequency step: 100 kHz

Setting method The procedure for setting frequencies with the arrow keys is as follows:

Example: To change the frequency from 360.3 MHz to 360.7 MHz by 100 kHz.

- 1. Set the frequency to 360.3 MHz.
- 2. Use the arrow keys (>>>> to place the cursor on the digit of 100 kHz.

SG1 Frequency	360. <mark>3</mark> 00	0 000 00 MHz	
		100.000 00 kHz	

Figure 4.2.3-1 Frequency Dialog Box

3. Use the arrow keys ito increase or decrease the frequency by 100 kHz step.

4.2.4 Frequency setting resolution					
	(Frequency) or Top>Frequer				
	Sets a resolution of arrow keys for setting frequencies.				
	When the MG3710A/MG3710E/MG3740A is in the frequency setting mode, press Incr Set of the main function key to display the Increment dialog box. Enter numbers in the Increment dialog box to specify a resolution of arrow keys				
Remote command	Specify a frequency se	etting resolution			
	Command				
	[:SOURce[1] 2]:FRE	EQuency:STEP[:INCRement] <freq></freq>			
	Query				
	[:SOURce[1] 2]:FRE	EQuency:STEP[:INCRement]?			
	Response				
	<freq></freq>	Unit: Hz			
	Parameter				
	<freq></freq>	Step level			
	Range	0.01 Hz to 1 GHz			
	Resolution	0.01 Hz			
	Default	100 kHz			
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ			
		When omitted Hz			
	Programming Example	9			
	To set the frequency st	ep level to 200 kHz.			
	FREQ:STEP 200KHZ				
	FREQ:STEP?				
	>200000.00				
Setting method	arrow keys is as follow	cifying frequency setting resolution with the vs: e frequency with the frequency setting resolution 9			
	kHz.				
	 When the MG3710A/MG3710E/MG3740A is in the frequency setting mode, press Incr Set of the main function key to display the Increment dialog box in the active function frame. 				

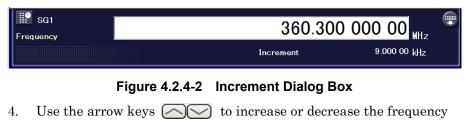
4.2 Frequency Setting Method: Frequency

2. Set the numeric value "9" to set the step frequency to 9 kHz.





3. Press the unit key "kHz" of the function key to set the step frequency to 9 kHz.



by 9 kHz step.

4.3 Frequency Setting Items

Frequency or Top>Frequency

When you press **Frequency** of the main function key or **F1 Frequency** on the main function menu, the MG3710A/MG3710E/MG3740A becomes the frequency setting mode and the Frequency function menu is displayed.

Page	Key No.	Menu Display	Function	
1	F1	Freq Ref	Enables/disables the frequency relative display.	
		<u>Off</u> On	Refer to 4.3.1 "Frequency relative display".	
	F2	Freq Offset	Enables/disables the frequency offset.	
		<u>Off</u> On	Refer to 4.3.2 "Frequency offset".	
	F3	Offset Value	Sets the frequency offset value.	
		0.00 Hz	Refer to 4.3.2 "Frequency offset".	
	F4	Freq Multiplier	Enables/disables the frequency offset multiplier.	
		<u>Off</u> On	Refer to 4.3.3 "Frequency offset multiplier".	
	F5	Multiplier Value	Sets the value of the frequency offset multiplier.	
		1.000 x	Refer to 4.3.3 "Frequency offset multiplier".	
	$\mathbf{F7}$	Channel Settings	Displays the channel setting function menu.	
		Channel Settings	Refer to 4.4 "Channel Setting".	
	F8	Evon Suno	Sets the frequency synchronization of SG1 and SG2.	
		Freq Sync	Refer to 4.6.1 "Frequency synchronization: Freq Sync".	

 Table 4.3-1
 Frequency Function Menu

4.3 Frequency Setting Items

Page	Key No.	Menu Display	Function
2	F1	Phase Noise Opt. <u><200 kHz</u> >300 kHz	Sets the phase noise optimization. Refer to 4.6.2 "Phase noise optimization: Phase Noise Optimize".
F2 RF Spectrum <u>Normal</u> Reverse		<u>Normal</u>	Inverts the spectrum of RF output. This is available in MG3740A only when option-020/120 is installed. Refer to 4.6.3 "Spectrum reverse: RF Spectrum".
	F3	Ref Source <u>Auto</u> Int	Sets reference frequency source. Refer to 4.6.4 "Reference oscillator".
	F4	Ref Freq 10 MHz	Selects a frequency of external reference signal from 5 MHz, 10 MHz, and 13 MHz. Refer to 4.6.4 "Reference oscillator".
	F5	LO Source <u>Int</u> Ext/Sync	Sets a local signal source. This is available when the MG3710A/MG3710E-017/117 is installed. This is not available in MG3740A. Refer to 4.6.5 "Local signal source".
	F6	LO Out <u>Off</u> On	Adjusts the phase of a local signal. This is available when the MG3710A/MG3710E-017/117 is installed. This is not available in MG3740A. Refer to 4.6.5 "Local signal source".
	F7	LO Phase 0.00 deg	Displays the LO Phase screen and adjusts the LO phase. This is not available in MG3740A. Refer to 4.6.5 "Local signal source".
	F8	Ref Clock Adjustment	Displays the Freq Adjustment function menu and adjusts the frequency of the internal reference frequency signal. Refer to 4.6.6 "Ref Clock Adjustment".

 Table 4.3-1
 Frequency Function Menu (Cont'd)

4.3.1 Frequency relative display: Freq Ref

Frequency or Top>Frequency, >Freq Ref: Freq Ref Enables/disables the frequency relative display.

The frequency relative display shows a difference from the reference output frequency.

When you turn the frequency relative display from Off to On, a difference from 0 Hz, which is the reference frequency, is displayed. Above it, the actual output frequency is displayed.

RF output frequency = display frequency + output frequency in the relative value display

	Example 1	Example 2	Example 3	Example 4
Output frequency	1.000 GHz	$1.000~\mathrm{GHz}$	1.010 GHz	0.990 GHz
Frequency relative display	Off	0.00 Hz	10 MHz	$-10 \mathrm{~MHz}$
Displayed frequency	1.000 GHz	0.00 Hz	10 MHz	-10 MHz

Press F1 Freq Ref to switch the frequency relative display.

Off Displays frequencies in absolute values (Default).

On Display frequencies in relative values. The "REF" is displayed in the frequency indicator.

Enable/disable the frequency relative display **Remote command** Command

[:SOURce[1]|2]:FREQuency:REFerence:STATe <boolean>

Query

[:SOURce[1] | 2]:FREQuency:REFerence:STATe?

Response

<boolean>

0 or 1

Parameter

<boolean></boolean>	Frequency relative display On/Off
OFF 0	In absolute values (Default)
ON 1	In relative values

Programming Example

To enable the frequency relative display. FREQ:REF:STAT ON FREQ:REF:STAT? > 1

4.3.2 Frequency offset

Freq Offset

Frequency or Top>Frequency, >Freq Offset

Enables/disables the frequency offset.

When the frequency offset is on, the frequency offset value specified with **F3 Offset Value** is added to the display frequency, and the actual output frequency is displayed above it.

	Example 1	Example 2	Example 3
Output frequency	1.000 GHz	1.000 GHz	1.000 GHz
Frequency offset	Off	10 MHz	-10 MHz
Displayed frequency	1.000 GHz	1.010 GHz	0.990 GHz
Press F2 Freq Offse Off Does	t to toggle On/Off o not use the freque		
On Uses	the frequency offs	et. The "OFFS" is	displayed in the

 Table 4.3.2-1
 Frequency Offset Setting Example

Remote command Enable/disable the frequency offset Command

[:SOURce[1]|2]:FREQuency:OFFSet:STATe <boolean>

Query

[:SOURce[1]|2]:FREQuency:OFFSet:STATe?

0 or 1

frequency indicator.

Response

```
<boolean>
```

Parameter

<boolean></boolean>	Frequency offset On/Off
OFF 0	Does not use the frequency offset (Default).
ON 1	Uses the frequency offset.

Programming Example

To use the frequency offset. FREQ:OFFS:STAT ON FREQ:OFFS:STAT? > 1

Frequency Offset Value: Offset Value

Frequency or Top>Frequency, >Offset Value Sets the frequency offset value.

Press **F3 Offset Value** to set a frequency offset value in the Offset Value dialog box in the active function frame.

Setting range	$-200~\mathrm{GHz}$ to 200 GHz
Resolution	0.01 Hz
Default	0 Hz

Remote command

Set the frequency offset value Command

[:SOURce[1]|2]:FREQuency:OFFSet <freq>

Query

[:SOURce[1]|2]:FREQuency:OFFSet?

Response

<freq>

Unit: Hz

Parameter

<freq> Setting range Resolution Default Suffix code Offset value -200 GHz to 200 GHz 0.01 Hz 0 Hz HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ When omitted: HZ

Programming Example

To set the frequency to 50 MHz. FREQ:OFFS 50MHZ FREQ:OFFS? > 50000000.00

4.3.3 Frequency offset multiplier

Frequency offset multiplier: Freq Multiplier

Frequency or Top>Frequency, >Freq Multiplier Sets a frequency offset multiplier.

When this function is on, the actual output frequency is multiplied by a frequency offset multiplier and the result is displayed. Above the result, the actual output frequency is displayed.

	Example 1	Example 2	Example 3
Output frequency	1.000 GHz	1.000 GHz	1.000 GHz
Frequency offset multiplier	Off	2	-2
Displayed	1.000 GHz	2.000 GHz	-2.000 GHz
frequency			
frequency	r to onchlo/dischl	o the frequency	ffoot multiplion
1 0	Does not use the	e the frequency offset	-
frequency Press F4 Freq Multipli	Does not use the (Default)		t multiplier.

 Table 4.3.3-1
 Frequency Offset Multiplier Setting Example

Remote command	Enable/disable the frequency offset multiplier	
	Command	
	[:SOURce[1] 2]:FREQuency:MULTiplier:STATe <boolean></boolean>	

Query

[:SOURce[1]|2]:FREQuency:MULTiplier:STATe?

Response

<boolean>

0 or 1

Parameter	
-----------	--

<boolean></boolean>	Frequency offset multiplier On/Off
OFF 0	Does not use the frequency offset multiplier.
	(Default)
ON 1	Uses the frequency offset multiplier.

Programming Example

To enable the frequency offset multiplier. FREQ:MULT:STAT 1 FREQ:MULT:STAT? > 1

Frequency offset multiplier: Multiplier Value

(Frequency) or Top>Frequency, >Multiplier Value

Sets the value of the frequency offset multiplier.

Press **F5 Multiplier Value** to set a value in the Multiplier Value dialog box in the active function frame.

Setting range	-1000 to -0.001 , 0.001 to 1000
Resolution	0.001
Default	1

Remote command Set a frequency offset multiplier Command [:SOURce[1]|2]:FREQuency:MULTiplier <ext numeric>

Query

[:SOURce[1]|2]:FREQuency:MULTiplier?

Response

<ext numeric>

Parameter

<ext_numeric></ext_numeric>	
Setting range	-1000 to $-0.001,0.001$ to 1000
Resolution	0.001
Default	1

Programming Example

To set a frequency offset multiplier to 0.5. FREQ:MULT 0.5 FREQ:MULT? > 0.500

4.4 Channel Setting

(Frequency) or Top>Frequency, >Channel Settings

When you press Frequency of the main function key or **F1 Frequency** on the main function menu, the MG3710A/MG3710E/MG3740A becomes the frequency setting mode. When you press **F7 Channel Settings** on the Frequency function menu, the Channel Setting function menu is displayed and the MG3710A/MG3710E/MG3740A becomes the channel setting mode. Refer to 4.5 "Channel Table: Edit Table" for the explanation about channels.

This section assumes that you press **F7 Channel Settings** and the MG3710A/MG3710E/MG3740A is in the channel setting mode, unless otherwise specified.

Page	Key No.	Menu Display	Function	
1	F1	Display <u>Freq</u> Channel	Selects either frequency or channel for inputting and displaying the RF frequency. Refer to 4.4.1 "Frequency/channel display: Display".	
	F2	Frequency Off <u>On</u>	Selects whether or not to display the frequency when Channel is selected by F1 Display . Refer to 4.4.2 "Frequency display: Frequency"	
	F3	Channel 0	Selects a Channel number when Channel is selected by F1 Display .	
		\$	Refer to 4.4.3 "Channel selection: Channel".	
	F4	Channel Group	Selects a Channel Group.	
		No Group	Refer to 4.4.4 "Channel Group".	
	F8	Edit Table	Creates and edits a channel table. Refer to 4.5 "Channel Table: Edit Table".	

Table 4.4-1 Channel Settings Function Menu

4.4.1 Frequency/channel display: Display

Frequency or Top>Frequency, >Channel Settings >Display

Selects either frequency or channel for inputting and displaying the RF frequency.

Press **F1 Display** on the Channel Settings function menu to switch "Freq" and "Channel".

Freq Channel Frequency display (Default) Channel display



Figure 4.4.1-1 Channel Display

Remote command Select either frequency or channel for inputting and displaying the RF frequency Command [:SOURce[1]|2]:FREQuency:TYPE FREQuency|CHANnel Query [:SOURce[1]|2]:FREQuency:TYPE? Response <mode> Parameter <mode> FREQuency Frequency display (Default) CHANnel Channel display **Programming Example** To set channel for inputting and displaying the RF frequency. FREQ:TYPE CHAN FREQ:TYPE? > CHAN

4.4.2 Frequency display: Frequency

(Frequency) or Top>Frequency, >Channel Settings>Frequency

Displays/hides the frequency when a channel number is displayed on the screen. This function is available only in the channel setting mode.

Press **F2 Frequency** on the Channel Settings function menu to toggle On/Off.

Off	Does not display Frequency
On	Displays frequency (Default)

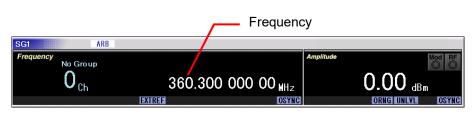


Figure 4.4.2-1 Channel and Frequency Display

Remote command

Display/hide the frequency in the channel setting mode Command

[:SOURce[1]|2]:FREQuency:CHANnels:DISPlay <boolean>

Query

[:SOURce[1]|2]:FREQuency:CHANnels:DISPlay?

Response

<boolean>

0 or 1

Parameter

<boolean></boolean>
OFF 0
ON 1

Frequency display Does not display Frequency Displays frequency (Default)

Programming Example

To display the frequency. SOUR2:FREQ:CHAN:DISP ON SOUR2:FREQ:CHAN:DISP? > ON

4.4.3	Channel	selection:	Channel
-------	---------	------------	---------

Frequency or Top>Frequency, >Channel Settings>Channel Sets a channel specified in the channel table. This function is available only in the channel setting mode.

Press **F3 Channel** on the Channel Settings function menu to set a channel in the **Channel** dialog box in the active function frame.

Remote command

Set a channel number

Command

[:SOURce[1]|2]:FREQuency:CHANnels:NUMBer <ext_integer>

Query

[:SOURce[1]|2]:FREQuency:CHANnels:NUMBer?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	Channel number
Setting range	The channel range of a channel group (Up to 20000)
Resolution	1
Default	0

Programming Example

To set a channel number to 100. FREQ:CHAN:NUMB 100 FREQ:CHAN:NUMB? > 100

Setting method

Using the rotary knob or arrow keys

Use the arrow keys \checkmark to place the cursor on the digit to be changed, and use the rotary knob or the arrow keys \checkmark to specify a number. Rotate the rotary knob to the right or press \checkmark to increase the channel number. Rotate the rotary knob to the left or press \checkmark to decrease the channel number.



Figure 4.4.3-1 Channel Dialog Box

If the rotary knob is turned clockwise or is pressed with the end channel number selected, the cursor moves to the start channel of the next channel group. This rule, however, does not apply to the end channel number of the end channel group.

If the rotary knob is turned counterclockwise or \bigotimes is pressed with the start channel number selected, the cursor moves to the end channel of the previous channel group. This rule, however, does not apply to the start channel number of the start channel group.

Using the numeric keypad

Enter a number in the **Channel** dialog box using the numeric keypad, and then press **F1 Enter** to finalize the value. The channel is displayed in the SG information display frame. If you press **Cancel** before pressing **F1 Enter**, the entered value becomes invalid and returns to the state before your input.

Only a channel belonging to the same group as the current channel can be specified using the numeric keypad.

4.4.4 Channel Group

Greenergy or Top>Frequency, >Channel Settings>Channel Group Sets a channel group specified in the channel table.

This function is available only in the channel setting mode.

Press **F4 Channel Group** on the Channel Settings function menu to display the Channel Group function menu and select Channel Group to be used. Press \bigcirc to display page 2 and 3.

Setting range 1 to 19

Set a channel group

Remote command

Command

[:SOURce[1]|2]:FREQuency:CHANnels:GROup <ext_integer>

Query

[:SOURce[1]|2]:FREQuency:CHANnels:GROup?

Response

<ext_integer>

Parameter

<ext_integer>
Setting range

Channel group number 1 to groups of the channel group table (up to 19)

Programming Example

To set a channel group to 2. FREQ:CHAN:GRO 2 FREQ:CHAN:GRO? > 2

4.5 Channel Table: Edit Table

Frequency or Top>Frequency, >Channel Settings>Edit Table This function is available only in the channel setting mode.

On the MG3710A/MG3710E/MG3740A, you can assign a channel number to any frequency. In addition, channels with a certain frequency interval can be registered as a channel group. The maximum 19 channel groups can be registered as a channel table.

Press **F8 Edit Table** on the Channel Settings function menu to display the Channel Table and the Channel Table Edit function menus.

Select items to set using the cursor on the table and press **F1 Edit Item** to enter values in the displayed dialog boxes. Refer to 4.5.1 "Registering channel groups" for setting methods.

	Channel Table				
	Group Name	Start	End	Start Frequency	Channel Spacing
1	Group01	1	10	800.0000000 MHz	10.00000 kHz
2	Group02	11	20	810.0000000 MHz	10.00000 kHz
3	Group03	21	30	820.0000000 MHz	10.00000 kHz
4	Group04	31	40	830.0000000 MHz	10.00000 kHz
5	Group	0	0	1.0000000000 GHz	16.00000 kHz

Figure 4.5-1 Channel Table Dialog Box

 Table 4.5-1
 Display Items of Channel Table

Display	Description
Group Name	Channel group name
Start	The beginning channel number of the channel group
End	The last channel number of the channel group
Start Frequency	The beginning channel frequency
Channel Spacing	The interval in frequency between channels

4.5 Channel Table: Edit Table

Page	Key No.	Menu Display	Function	
1	F1	Edit Item	Displays input dialog boxes for items selected by the cursor in the Channel Table of the active function frame where you can enter appropriate numbers. Refer to 4.5.1 "Registering channel groups".	
	F2	Insert Row	Adds a channel group row above the Channel Table. Refer to 4.5.2 "Adding channel groups: Insert Row".	
	F3	Delete RowDeletes one row of Channel Group selected by curs on Channel Table. Refer to 4.5.3 "Deleting channel groups: Delete Row		
	F4	Clear	Clears the data of all channel groups in the Channel Table. Refer to 4.5.4 "Deleting channel tables: Clear".	
	F7	Open	Recalls the data of the Channel Table. Refer to 4.5.5 "Recalling channel tables: Open".	
	F8 Save		Saves the data of the Channel Table. Refer to 4.5.6 "Saving channel tables: Save".	

 Table 4.5-2
 Channel Table Edit Function Menu

4.5.1 Registering channel groups

requercy or Top>Frequency, >Channel Settings>Edit Table Registers channel groups for setting channels.

Remote command

Register channel groups Command [:SOURce[1]|2]:FREQuency:CHANnels:EDIT <ext_integer1>,<string>,<ext_integer2>,<ext_integer3>,<f</pre>

req1>,<freq2>

Parameter

aracters enclosed
(())
uotes (' ')
t be larger than

Details

A blank row before the specified row position is padded with default values.

Programming Example

To set Group Number 03: Group Name 802.11b, Start Channel 1, End Channel 13, Start Freq. 2.412 GHz, and Channel Space 5 MHz. FREQ:CHAN:EDIT 3, "802.11b", 1, 13, 2.412GHZ, 5MHZ

Setting methodThe procedure for registering channel groups is as follows:Example: To create a channel group on the fifth row of the channel table
under the following condition:

- Group name: 802.11b
- Channels to be used: 1 to 13 channels
- The beginning channel frequency: 2.412 GHz
- The interval in frequency between channels: 5 MHz

(1) Specifying a group name

			802.1	802.11b			
Group Name A B C D E F G H I J K L M N O P Q R S T U V W X Y Z , . @ a b c d e f g h i j k l m n o p q r s t u v w x y z ; ' " < 0 1 2 3 4 5 6 7 8 9 ! # \$ \$ & () + - = []^ {] / ; * ?			uvwxyz; * ~ <>				
		Channel Table					
		Group Name	Start	End	Start Frequency	Channel Spacing	
	1	Group01	1	10	800.0000000 MHz	10.00000 kHz	
	2	Group02	11	20	810.0000000 MHz	10.00000 kHz	
	3	Group03	21	30	820.00000000 MHz	10.00000 kHz	
	4	Group04	31	40	830.0000000 MHz	10.00000 kHz	
•	5	Group	0	0	1.0000000000 GHz	16.00000 kHz	

Figure 4.5.1-1 Group Name Dialog Box

- 1. Press **F2 Insert Row** to add an input row and place the cursor on the "Group Name" of the fifth row.
- 2. When you press **F1 Edit Item**, the **Group Name** dialog box and the Enter Item function menu is displayed in the active function frame.

Table 4.5.1-1 Enter Item Function Menu
--

Page	Key No.	Menu Display	Function
1	F1	Enter Item	Edits values and returns to the previous menu.
	F8	Cancel	Returns to the previous menu.

- 3. Enter a group name, "802.11b", in the **Group Name** dialog box.
- Press F1 Enter Item to set the group name specified in the Channel Table and close the Group Name dialog box.

Notes:

• The maximum 100 characters are allowed for a group name.

- Characters in the character palette are available for group names.
- The following restrictions apply to group names with long character strings:
 Channel Setting, Channel Group Function Menus
 If the display range is exceeded, the display is zoomed-out. If the display range is still exceeded after zooming-out, the out-of-range parts are omitted.
- Group Name Display of Frequency Data Frame If the display range is exceeded, the out-of-range parts are omitted.
- (2) Specifying channels to be used

SG1 Start Number		Number				I I
					Increment	1
		Channel Table				
		Group Name	Start	End	Start Frequency	Channel Spacing
	1	Group Name Group01	Start 1	End 10	Start Frequency 800.00000000 MHz	Channel Spacing 10.00000 kHz
	1		Start 1 11			
		Group01	1	10	800.0000000 MHz	10.00000 kHz
	3	Group01 Group02	1 11	10 20	800.0000000 MHz 810.0000000 MHz	10.00000 kHz 10.00000 kHz

Figure 4.5.1-2 Start Number Dialog Box

- 1. Place the cursor on the "Start" of the fifth row.
- 2. Press **F1 Edit Item** to display the **Start Number** dialog box in the active function frame.
- 3. Use the numeric keypad to enter "1" in the **Start Number** dialog box.
- 4. Press **F1 Enter** to set the Start channel in the Channel Table and close the **Start Number** dialog box.

nd	Number			١٥	
				Increment	1
	Channel Table				
	Group Name	Start	End	Start Fraguancy	Channel Specing
	Group Name	Start	End	Start Frequency	Channel Spacing
	1 Group01	1	10	800.0000000 MHz	10.00000 kHz
	1 Group01 2 Group02	1	10 20	800.00000000 MHz 810.00000000 MHz	10.00000 kHz 10.00000 kHz
	1 Group01	1	10	800.0000000 MHz	10.00000 kHz

Figure 4.5.1-3 End Number Dialog Box

- 5. Place the cursor on the "End" of the fifth row.
- 6. Press **F1 Edit Item** to display the **End Number** dialog box in the active function frame.
- 7. Use the numeric keypad to enter "13" in the **End Number** dialog box.
- 8. Press **F1 Enter** Item to set the End channel in the Channel Table and close the **End Number** dialog box.

Note:

The channel setting ranges 0 to 20000. The End channel, however, must be set to a number same as or more than the Start channel.

SG1 Start Frequency						2.412
					Increment	100.000 00 kHz
	-	Channel Table				
			Ctt	F -4		
		Group Name	Start	End	Start Frequency	Channel Spacing
	1	Group Name Group01	1	10	800.0000000 MHz	10.00000 kHz
	1	Group Name	Start 1 11			
	1	Group Name Group01	1	10	800.0000000 MHz	10.00000 kHz
	1 2 3	Group Name Group01 Group02	1 11	10 20	800.0000000 MHz 810.0000000 MHz	10.00000 kHz 10.00000 kHz

(3) Specifying the Start channel frequency and a frequency interval

Figure 4.5.1-4 Start Frequency Dialog Box

- 1. Place the cursor on the "Start Frequency" of the fifth row.
- 2. Press **F1 Edit Item** to display the **Start Frequency** dialog box in the active function frame.

Settable range	Refer to 4.1 "Frequency".
Resolution	0.01 Hz
Default	1 GHz

- 3. Use the numeric keypad to enter "2.412" in the **Start Frequency** dialog box.
- 4. Press the unit **F1 GHz** on the function menu to set a frequency of the Start channel in the Channel Table and close the **Start Frequency** dialog box.

Chapter 4 Frequency

SG1 Channel Spacing						5
					Increment	100 Hz
		Channel Table				
		Group Name	Start	End	Start Frequency	Channel Spacing
	1	Group Name Group01	Start 1	End 10	Start Frequency 800.00000000 MHz	Channel Spacing 10.00000 kHz
	1		Start 1 11			
		Group01	1	10	800.0000000 MHz	10.00000 kHz
	3	Group01 Group02	1	10 20	800.00000000 MHz 810.00000000 MHz	10.00000 kHz 10.00000 kHz

Figure 4.5.1-5 Channel Spacing Dialog Box

- 5. Place the cursor on the "Channel Spacing" of the fifth row.
- 6. Press **F1 Edit Item** to display the **Channel Spacing** dialog box in the active function frame.

Settable range	$1~\mathrm{Hz}$ to 999.999999 MHz
Resolution	1 Hz
Default	16 kHz

- 7. Use the numeric keypad to enter "5" in the **Channel Spacing** dialog box.
- 8. Press the unit **F2 MHz** on the function menu to set a frequency interval and close the **Channel Spacing** dialog box.

4.5.2 Adding channel groups: Insert Row

Greener or Top>Frequency, >Channel Settings>Edit Table>Insert Row Adds a row to create a channel group.

Use the following procedure to add a row using **F2 Insert Row**.

- When editing by creating a new setting, a row is added to the top of the Channel Group selected by the cursor on the Channel Table.
- When editing by reading an existing Channel Table using **F7 Open**, a row is added to the final row irrespective of the cursor position.

The procedure for inserting a row in the channel table is as follows:

Operation Example: To read existing Channel Table and insert new row

 After loading the existing channel table by pressing F7 Open, press F2 Insert Row to insert a new row on the 6th row which is the last row.

	Group Name	Start	End	Start Frequency	Channel Spacing
1	Group01	1	10	800.0000000 MHz	10.00000 kHz
2	Group02	11	20	810.00000000 MHz	10.00000 kHz
	Group03	21	30	820.0000000 MHz	10.00000 kHz
	Group04	31	40	830.0000000 MHz	10.00000 kHz
5	802.11b	1	13	2.4120000000 GHz	5.0000000 MHz
	Channel Table				
	Channel Table			_	
	Channel Table Group Name	Start	End	Start Frequency	Channel Spacing
1		Start 1	End 10	Start Frequency 800.0000000 MHz	Channel Spacing 10.00000 kHz
1	Group Name Group01				
1 2	Group Name Group01	1	10	800.0000000 MHz	10.00000 kHz
1 2 3	Group Name Group01 Group02	1	10 20	800.00000000 MHz 810.00000000 MHz	10.00000 kHz 10.00000 kHz
1 2 3 4	Group Name Group01 Group02 Group03	1 11 21	10 20 30	800.0000000 MHz 810.0000000 MHz 820.0000000 MHz	10.00000 kHz 10.00000 kHz 10.00000 kHz

Figure 4.5.2-1 Inserted New Row

4.5.3 Deleting channel groups: Delete Row

Frequency or Top>Frequency, >Channel Settings>Edit Table>Delete Row Deletes the selected channel group.

Use the cursor to select a group to delete, and press **F3 Delete Row** to delete it.

Remote command Delete a channel group Command [:SOURce[1]|2]:FREQuency:CHANnels:DELete <integer>

Parameter

<integer></integer>	No.
Setting range	1 to 19

Programming Example

To delete the 2nd channel group. FREQ:CHAN:DEL 2

Setting method

Example: To delete the "Group" channel group on the 2nd row of the channel group

- 1. Press Solution on the "Group" of the 2nd row.
- Press F3 Delete Row to delete a channel group on the 2nd row. The existing channel groups move up and are placed on the 2nd row or later.

		Channel Table				
		Group Name	Start	End	Start Frequency	Channel Spacing
	1	Group01	1	10	800.0000000 MHz	10.00000 kHz
•	2	Group02	11	20	810.0000000 MHz	10.00000 kHz
	3	Group03	21	30	820.0000000 MHz	10.00000 kHz
	4	Group04	31	40	830.0000000 MHz	10.00000 kHz
		Channel Table				
		Channel Table				
		Channel Table Group Name	Start	End	Start Frequency	Channel Spacing
	1		Start 1	End 10	Start Frequency 800.0000000 MHz	Channel Spacing 10.00000 KHz
•	1	Group Name	Start 1 21			

Figure 4.5.3-1 Deleted Channel Group

4.5.4 Deleting channel tables: Clear

Frequency or Top>Frequency, >Channel Settings>Edit Table>Clear Press F4 Clear to delete all data in the channel table.

Remote command Delete a channel table Command [:SOURce[1]|2]:FREQuency:CHANnels:DELete:ALL

Programming Example

To delete all data of the channel table. FREQ:CHAN:DEL:ALL

Setting method

Press **F4 Clear** to delete all data in the channel table.

	01-1	E-d		0
	Start			Channel Spacing
	1			10.00000 kHz
Group02	11	20	810.0000000 MHz	10.00000 kHz
Group03	21	30	820.0000000 MHz	10.00000 kHz
Group04	31	40	830.0000000 MHz	10.00000 kHz
Channel Table				
Group Name	Start	End	Start Frequency	Channel Spacing
	Group04 Channel Table	Group01 1 Group02 111 Group03 21 Group04 31 Channel Table	Group01 1 10 Group02 11 20 Group03 21 30 Group04 31 40 Channel Table	Group01 1 10 800.0000000 MHz Group02 11 20 810.0000000 MHz Group03 21 30 820.0000000 MHz Group04 31 40 830.0000000 MHz

Figure 4.5.4-1 Deleted Channel Table

4.5.5 Recalling channel tables: Open

	Frequency or Top >Frequency, >Channel Settings>Edit Table>Open Recalls the saved channel table file.		
Remote command	Recalls a channel table file Command :MMEMory[1] 2:LOAD:FREQuency:CHANnels <string>[,<device>]</device></string>		
	Parameter		
	<string></string>	File name without an extension	
		Character string within 100 characters enclosed	
		by double quotes (" ") or single quotes (' ')	
		(excluding extension)	
	<device></device>	Drive number	
	Options	A to Z, currently selected drive when omitted	
	Programming Example		
	To recall the "ABC" channel table file from D drive.		
	MMEM:LOAD:FREQ:CHAN "ABC",D		
Setting method	The procedure is	as follows:	

1. Press **F7 Open** to open the Channel Table Recall function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Specifies the Drive containing the channel table to recall.
	F7	Open	Recalls the channel table file in the folder specified in Drive.
	F8	Cancel	Returns to the previous menu.

 Table 4.5.5-1
 Channel Table Recall Function Menu

- 2. Press **F1 Drive** to select a drive containing the channel table file to recall.
- 3. The **Channel Table Recall** dialog box is displayed in the active function frame, and File List is displayed in the function display frame.

4.5 Channel Table: Edit Table

	Channel20111214_005	
Channel Table Reca	all .	
File List		
Path : C:\Anritsu\MG3	710A\User Data\ChannelTable\	
Name		
Channel20111214_000		
Channel20111214_001		
Channel20111214_002		
Channel20111214_003		
Channel20111214_004		
Shanneiz0111214_004		
Channel20111214_005		
Channel20111214_005 Channel20111214_006		
Channel20111214_005 Channel20111214_005 Channel20111214_006 Channel20111214_007 Channel20111214_008		

Figure 4.5.5-1 Channel Table Recall Dialog Box

- 4. Use the rotary knob or arrow keys 🕢 to select a channel table file to recall.
- Press F7 Open to recall the selected channel table file. Press F8
 Chancel to return to the previous screen without recall the channel table file.

Notes:

- File names are listed in alphanumeric order.
- If no channel table file exists, "File not found" is displayed.

4.5.6 Saving channel tables: Save

Frequency or Top>Frequency, >Channel Settings>Edit Table>Save Saves a channel table containing the specified parameters.

Remote command

Save a channel table
Command
:MMEMory[1]|2:STORe:FREQuency:CHANnels
[<string>[,<device>]]

Parameter

<string></string>	File name without an extension Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ') (excluding extension)	
	The following characters cannot be used: \ / : * ? `` " \ / < >	
	Automatically named as "Channel_[Date]_[Additional number].ch" when omitted.	
	The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.	
<device> Options</device>	Drive number A to Z, currently selected drive when omitted	

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.A destination path to save the file will be the following directory in the

specified drive. Anritsu\MG3710A\User Data\ChannelTable\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To save the "ABC" channel table file in D drive. MMEM2:STOR:FREQ:CHAN ``ABC'', D

The procedure for saving a channel table is as follows:

Setting method

Example: To name the channel table file currently displayed as "W-LAN" and save it

1. Press **F8 Save** to open the Channel Table Save function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive	Specifies a Drive where the channel table is saved.
		C:	
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F7	Save	Saves the channel table in the folder specified in Drive.
	F8	Cancel	Returns to the previous menu.

Table 4.5.6-1 Channel Table Save Function Menu

- 2. The **Channel Table Save** dialog box is displayed in the active function frame.
- 3. Press **F1 Drive** to select a destination drive. File List of the selected drive is displayed in the function display frame.

	Channel20111214_010	
Channel Table Save	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z , . @ a b c d e f g h i j k l m n o p q r s t u v w x y z ; ´´ 0 1 2 3 4 5 6 7 8 9 ! # \$ \$ & () + − = _ [] ^ { }	
File List		
Path : C:\Anritsu\MG3710	A\User Data\ChannelTable\	
Name		
Channel20111214_000		
hannel20111214_001		
hannel20111214_002		
hannel20111214_003		
hannel20111214_004		
hannel20111214_005		
hannel20111214_006		
hannel20111214_007		
hannel20111214_008		
hannel20111214_009		
hannel20111214_010		
Channel20111214_011		
Channel20111214_012		
hannel20111214_013		
Channel20111214_014		
Channel20111214_015 Channel20111214_016		

Figure 4.5.6-1 Channel Table Save Dialog Box

- Enter a file name in the Channel Table Save dialog box. By default, the "Channel_Date_Additional number" is displayed in the text box.
- Enter "W-LAN" in the dialog box and press F7 Save. The channel table file with the entered file name is saved, and the Channel Table Save dialog box closes.

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Destination path: Anritsu\MG3710A\User Data\ChannelTable\
- Default destination name: Channel_[Date]_[Additional number].ch The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
- Characters available for file names are displayed on the character palette.
- The following characters cannot be used:
 / : * ? " " ' < > |
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

4.6 Frequency-Related Functions

When you press **Frequency** of the main function key or **F1 Frequency** on the main function menu, the MG3710A/MG3710E/MG3740A becomes the frequency setting mode. This section assumes that you press **Frequency** and the MG3710A/MG3710E/MG3740A is in the Frequency Setting mode, unless otherwise specified.

4.6.1 Frequency synchronization: Freq Sync

Frequency, >Freq Sync

Sets the frequency synchronization of SG1 and SG2.

When you change the SG-side frequency specified for SG Port, the changed value is added to (Parallel) or decreased from (Symmetry) the other SG-side frequency.

Press **F8 Freq Sync** to display the Freq Sync function menu. Set the frequency synchronization of SG1 and SG2 and adjust frequencies.

This is available when the MG3710A/MG3710E/MG3740A-062/064/066/162/164/166 is installed.

Table 4.6.1-1 Freq Sync Function Menu

Page	Key No.	Menu Display	Function
1	F1	Freq Sync with SG <u>Off</u> On	Sets the frequency synchronization of SG1 and SG2. Synchronization cannot be enabled by a change such as the frequency offset.
	F2	Freq Sync Mode <u>Parallel</u> Symmetry	Sets a frequency synchronization mode when Freq Sync is On.

Chapter 4 Frequency

Frequency synchronization On/Off: Freq Sync

Frequency or **Top>Frequency**, **>Freq Sync>Freq Sync with SG** Enables/disables the frequency synchronization of SG1 and SG2.

Press **F1 Freq Sync** on the Freq Sync function menu to set the frequency synchronization of SG1 and SG2.

Off	Does not synchronize frequencies (Default).
On	Synchronizes frequencies.

Remote command

Enable/disable the frequency synchronization of SG1 and SG2 Command

0 or 1

[:SOURce]:FREQuency:SYNC <boolean>

Query

[:SOURce]:FREQuency:SYNC?

Response

<boolean>

Parameter

<boolean></boolean>	Frequency synchronization
OFF 0	Does not synchronize frequencies (Default)
ON 1	Synchronizes frequencies

Details

This is available when the MG3710A/MG3710E/MG3740A-062/064/066/162/164/166 is installed.

Programming Example

To synchronize frequencies of SG1 and SG2. FREQ:SYNC ON FREQ:SYNC? > 1

Frequency synchronization: Freq Sync Mode

Frequency or Top>Frequency, >Freq Sync>Freq Sync Mode Sets a frequency synchronization mode when Freq Sync with SG is On.

 Press F2 Freq Sync Mode on the Freq Sync function menu to set values.

	Parallel	Parallel mode (Default) When you change the SG-side frequency specified for SG	
		Port, the changed value is added to the other SG-side	
		frequency.	
	Symmetry	Symmetry mode	
		When you change the SG-side frequency specified for SG Port, the changed value is decreased from the other SG-side frequency.	
	Example:		
	Parallel	When you add 100 MHz to the frequency of SG1 Port, 100 MHz is also added to the SG2 Port frequency.	
	Symmetry	When you add 100 MHz to the frequency of SG1 Port, 100	
	Symmetry	MHz is decreased from the SG2 Port frequency.	
Remote command	Set a frequer	ncy synchronization mode	
	Command		
	[:SOURce]:	FREQuency:SYNC:MODE PARallel SYMMetry	
	Query		
	[:SOURce]:FREQuency:SYNC:MODE?		
	Response		
	<mode></mode>	1 or 0	
	Parameter		
	<mode></mode>	Frequency synchronization	
	PARallel	Parallel mode (Default)	
	SYMMetry	Symmetry mode	
	Details		
	This is available when the		
	MG3710A/MG3710E/MG3740A-062/064/066/162/164/166 is installed.		
	Programming Example		
	To set the frequency synchronization mode to Parallel.		
	FREQ:SYNC:	MODE PAR	
	FREQ:SYNC:	MODE?	
	> PAR		

4.6.2 Phase noise optimization: Phase Noise Optimize

	 Frequency or Top>Frequency, >>>>Phase Noise Opt. Switching a loop character of PLL synthesizer circuit allows you to select a character of phase noise between Close-in Phase and Wide-Offset Phase. Press → to switch the function menu to page 2. Press F1 Phase Noise Opt. to select a character of phase noise. 		
	$\rm Offset < 200 \; kHz$	Best Close-in Phase noise (Default) Optimizes the Close-in Phase noise (Offset < 200 kHz).	
	Offset > 300 kHz	Best Wide-Offset Phase noise Optimizes the Wide-Offset Phase noise (Offset > 300 kHz).	
Remote command	Select a character of phase noise Command [:SOURce[1] 2]:FREQuency:SYNThesis[:STATe] 1 2		
	Query [:SOURce[1] 2]:FR	EQuency:SYNThesis[:STATe]?	
	Response <mode></mode>		
	Parameter		
	<mode></mode>	Character of phase noise	
	1	Optimized Close-in Phase noise (Default)	
	2	Optimized Wide-Offset Phase noise	
	Programming Exampl To set the phase noise SOUR2:FREQ:SYNT 2	e character of SG2 to Best Wide-Offset Phase noise.	

SOUR2:FREQ:SYNT?

4.6.3 Spectrum reverse: RF Spectrum

0.5 Opectium re		cuum		
	(Frequency) or Top>Fr	requency, >⊖→>RF Spectrum		
	You can use the s	spectrum reverse function when reversed modulation		
	signals must be i	nput, for example evaluating DUT for IF.		
	In MG3740A, you	u can use the spectrum reverse function only when		
	option-020/120 is	installed.		
	When the modulation is on, this function swaps I and Q and inve spectrum of RF signals. For both the waveform memory A and B,			
	spectrum is inve	spectrum is inverted.		
	Similar to this, F	6 Spectrum A and F7 Spectrum B of the ARB Setup		
	function menu or	n page 2 invert the spectrum of the waveform memory A		
	and the waveforr	n memory B, respectively. Reversing RF Spectrum and		
	Spectrum A or B	simultaneously returns the status of output waveform		
	to Normal.			
	Press \bigcirc to sw	ritch the function menu to page 2.		
	Press F2 RF Spe	ctrum to select spectrum of RF signals.		
	NI e rom e l			
	Normal	Does not invert the spectrum of output $(D \cap (U \cap V))$		
	2	waveform. (Default)		
	Reverse	Inverts the spectrum of output waveform.		
Remote command	Enable/disable the spectrum reverse			
	Command			
	[:SOURce[1] 2]:DM:POLarity[:ALL] NORMal INVert			
	_			
	Query			
	[:SOURce[1] 2]:DM:POLarity[:ALL]?		
	Response			
	<mode></mode>			
	Parameter			
	<mode></mode>	Whether to invert output waveform		
	NORMal	Normal: Do not invert (Default)		
	INVert	Reverse: Invert		
	Programming Ex	ample		
		put waveform of SG1.		
	TO INVERT THE OUT			

To invert the output waveform of SG1. DM:POL INV DM:POL? > INV

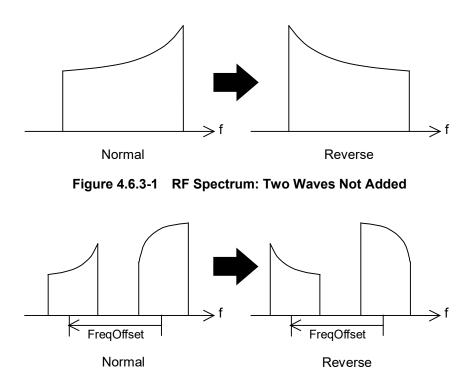


Figure 4.6.3-2 RF Spectrum: Two Waves Added

4.6.4 Reference oscillator

Reference oscillator: Ref Source

(Frequency) or Top>Frequency, >>>>Ref Source Sets reference frequency source. Press \bigcirc to switch the function menu to page 2. Press F3 Ref Source to select a reference frequency source between Int and Auto. The "EXTREF" is displayed in the frequency indicator when the external signal is used as the reference frequency source. Int Uses the internal frequency source of the MG3710A/MG3710E/MG3740A as the reference frequency source. Auto Uses the internal frequency source of the MG3710A/MG3710E/MG3740A as the reference frequency source, when a reference signal is not detected from the REF IN connector on the rear panel. Uses an external frequency source as the reference frequency source, when a reference signal is detected from the REF IN connector on the rear panel. (Default) **Remote command** Set a reference frequency source Command [:SOURce]:ROSCillator:SOURce:AUTO <boolean> Query [:SOURce]:ROSCillator:SOURce:AUTO? Response <boolean> 0 or 1 Parameter <boolean> Frequency reference signal source OFF|0 Sets a source to Int. ON | 1 Sets a source to Auto (Default). **Programming Example** To invert the output waveform. ROSC:SOUR:AUTO OFF ROSC:SOUR:AUTO? > 0

Chapter 4 Frequency

External signal frequency: Ref Freq

lemai signai nequeni	cy. Renned			
	Frequency or Top>	Frequency, >─→>Ref Freq		
	Set a frequency	of external reference signal for the MG3710A/MG3710E		
	/MG3740A.			
	When an extern	nal signal is used for a reference signal source, the		
		e external signal must be set for the MG3710A/MG3710E		
	/MG3740A.			
	Press \bigcirc to switch the function menu to page 2.			
		Press F4 Ref Freq to display the Ref Oscillator Freq function menu and		
		cy of the signal from 5 MHz, 10 MHz (default), and 13		
	MHz.			
Remote command	Sot a fraguana	, of the externel reference signal		
Remote command	Set a frequency of the external reference signal			
	Command			
	[:SOURce]:ROSCillator:FREQuency:EXTernal <freq></freq>			
	Query			
	[:SOURce]:ROSCillator:FREQuency:EXTernal?			
	Response			
	<freq></freq>	Unit: Hz		
	Parameter			
	<freq></freq>	Frequency of the external signal		
	a			

<freq> Frequency of the external signal Setting range Either value of 5 MHz, 10 MHz (Default), or 13 MHz Suffix code HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ When omitted: HZ

Programming Example

To set the frequency of the reference frequency signal to 13 MHz. ROSC:FREQ:EXT 13MHZ ROSC:FREQ:EXT? > 13000000

4.6.5 Local signal source

Local signal source: LO Source

Frequency) or Top>Frequency, $> \rightarrow >$ LO Source Sets a Local signal source.

This is available when the MG3710A/MG3710E-017/117 is installed. This is not available in MG3740A.

This is an independent parameter for each SG. It can be set when in the modulation output status (when either AM, FM, ϕ M, or Pulse modulation is On, or when the selected waveform setting is Mod=On).

Press \bigcirc to switch the function menu to page 2. Press **F5 LO Source** to select a signal source.

Int Ext/Sync Uses the internal Local signal source (Default). SG1:Ext Uses the external Local signal source. SG2:Sync Uses the same local signal source of SG1.

Remote command	Set a Local signal source	
	Command	
	SG1:	[:SOURce[1]]:LOCal:SOURce INT EXT
	SG2:	[:SOURce2]:LOCal:SOURce INT SYNC
	Query	
	SG1:	[:SOURce[1]]:LOCal:SOURce?
	SG2:	[:SOURce2]:LOCal:SOURce?
	Response	
	<mode></mode>	
	Parameter	
	<mode></mode>	Local signal source
	INT	Uses the internal Local signal source (Default).
	EXT	Uses the external Local signal source.
		This is available only for SG1.

SYNC

Details

This is available when the MG3710A/MG3710E-017/117 is installed.

SG2.

Uses the Local of SG1. This is available only for

Programming Example

To set a Local signal source to the external Local signal source. LOC:SOUR EXT LOC:SOUR? > EXT

Local signal output: LO Out

(Frequency) or Top>Frequency, $\rightarrow \rightarrow$ LO Out

Selects the external output of Local signal between On and Off.

This is available when the MG3710A/MG3710E-017/117 is installed. This is not available in MG3740A.

This is a shared parameter for each SG. It can be set when the installed SG1 and SG2 are in the modulation status (when either AM, FM, ϕ M, or Pulse modulation is On, or when the selected waveform setting is Mod=On).

Note:

When the MG3710A/MG3710E/MG3740A output signal EVM is to be measured, set LO Out to Off. If LO Out is set to On while the LO Out connector is opened, the MG3710A/MG3710E/MG3740A output signal EVM is degraded because of reflection.

Press \bigcirc to switch the function menu to page 2. Press **F6 LO Out** to select the external output between On and Off.

Off	Does not externally output Local signals
	(Default).
On	Externally outputs Local signals.

Remote command

Select the external output of Local signal between On and Off Command

[:SOURce]:LOCal:OUT <boolean>

Query

[:SOURce]:LOCal:OUT?

Response

<boolean>

0 or 1

Parameter	
<boolean></boolean>	Local signal source
OFF 0	Does not externally output Local signals
	(Default).
ON 1	Externally outputs Local signals.

Details

This is available when the MG3710A/MG3710E-017/117 is installed.

Programming Example

To externally output Local signals. LOC:OUT ON LOC:OUT? > 1

Local phase adjustment: LO Phase

 $\fbox{} Frequency, > \longrightarrow > LO Phase$

Adjusts phases of Local signals.

This is not available in MG3740A.

Press \bigcirc to switch the function menu to page 2. Press **F7 LO Phase** to display the **LO Phase** dialog box and set a phase.

SG1 LO Phase		0.00 deg
LO Phase	Increment	1.00 deg

Figure 4.6.5-1 LO Phase Dialog Box

Set a phase of RF output.

Setting range	$-180.00 \mbox{ deg}$ to $180.00 \mbox{ deg}.$
Resolution	0.01
Default	0

If the Local synchronization of the Baseband function is changed to On: A phase cannot be set when the Local signal source of SG1 is External. A phase cannot be set when the Local signal source of SG2 is Sync.

Chapter 4 Frequency

Remote command

Adjust a phase of Local signals

Command

[:SOURce[1]|2]:PHASe[:ADJust] <phase>

Query

[:SOURce[1]|2]:PHASe[:ADJust]?

Response

<phase>

Parameter

<phase> Setting range Resolution Default Phase of Local signals -180.00 deg to 180.00 deg 0.01 0

Programming Example

To set a phase of the Local signal to 4.25 deg. PHAS 4.25 PHAS? > 4.25

4.6.6 Ref Clock Adjustment

Frequency or Top>Frequency, >>>>Ref Clock Adjustment

Used for frequency calibration. For the calibration method, refer to 11.4 "Calibration".

Press \bigcirc to switch the function menu to page 2.

Press **F8 Ref Clock Adjustment** to display the Freq Adjustment function menu and adjust frequencies of the internal reference frequency signals.

Table 4.6.6-1 Freq Adjustment Function Menu

Page	Key No.	Menu Display	Function
1	F1	Reference Clock 0	Adjusts the frequency of the internal reference frequency signal.
	F2	Preset Reference Clock	Resets the internal reference frequency signal to factory shipment defaults.

Reference clock frequency: Reference Clock

Frequency or Top>Frequency, →>Ref Clock Adjustment>Reference Clock

Adjusts the internal reference frequency signals.

Press **F1 Reference Clock** on the Freq Adjustment function menu to display the **Reference Clock** dialog box. Adjust the internal reference frequency signals.

Setting range	0 to 1023
Resolution	1
Default	Factory shipment defaults



Figure 4.6.6-1 Reference Clock Dialog Box

Chapter 4 Frequency

Remote command Set the adjustment value of the internal reference frequency signals Command :CALibration:RCLock[:VALue] <integer>

Query

:CALibration:RCLock[:VALue]?

Response

<integer>

Parameter

<integer> Setting range Resolution Default

Adjustment value 0 to 1023 1 Factory shipment defaults

Programming Example

To set the adjustment value of the internal reference frequency signal to 511. CAL:RCL 511 CAL:RCL? > 511

Pres

eset reference clock:	Preset Reference Clock
	Frequency or Top>Frequency, > →> Ref Clock Adjustment>Preset Reference Clock
	Resets adjustments of the internal reference frequency signal to factory shipment defaults.
	Press F2 Preset Reference Clock on the Freq Adjustment function menu to reset values.
Remote command	Reset adjustment values of the internal reference frequency signal to factory shipment defaults
	Command
	:CALibration:RCLock[:VALue]:PRESet
	Programming Example
	To reset adjustment values of the internal reference frequency signal to
	factory shipment defaults.
	CALODES

CAL:RCL:PRES

Chapter 5 Output Level

This chapter describes the functions related to the level setting.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

5.1	Output	t Level
	5.1.1	Display description5-3
	5.1.2	Level indicator5-5
5.2	Output	t Level Setting Method: Level5-7
	5.2.1	Output level setting with numeric keypad 5-9
	5.2.2	Changing output level with rotary knob 5-10
	5.2.3	Changing output level with arrow keys5-11
	5.2.4	Output level setting resolution5-12
5.3	Output	t Level Setting Item5-14
	5.3.1	Relative level display: Reference 5-16
	5.3.2	Level offset: Offset5-19
	5.3.3	Output level limit5-22
	5.3.4	ATT Hold5-25
	5.3.5	Level synchronization: Sync5-27
	5.3.6	Calibrate Level5-28
	5.3.7	Optimize S/N5-29
5.4	User C	Correction: Correction
	5.4.1	User correction setting: Configure
		Correction
	5.4.2	Edit Item
	5.4.3	Adding correction data: Insert Row 5-37
	5.4.4	Deleting correction data: Delete Row5-38
	5.4.5	Deleting correction table: Clear 5-39
	5.4.6	Recalling user correction table: Open 5-40
	5.4.7	Saving user correction table: Save5-42
5.5	Use P	ower Sensor5-45
	5.5.1	Connection Settings 5-46
	5.5.2	Settings5-49
	5.5.3	Zero adjustment: Zero Sensor5-57
	5.5.4	Creating correction table: Create Correction
		File

5.1 Output Level

(Level) or Top>Level

When you press **Level** of the main function key or **F2 Level** on the top function menu, the MG3710A/MG3710E/MG3740A enters the output level setting mode and the **Level** dialog box is displayed in the active function frame.

This section assumes that you press **Level** and the MG3710A/MG3710E/MG3740A is in the output level setting mode, unless otherwise specified.

Output level setting range and resolution

The output level setting range varies depending on the options as follows:

MG3	710A/MG3710E			
S	G1	SG2		
043/143 no	043/143 not installed		ot installed	
042/142	041/141	072/172	071/171	Setting range
Not installed	Not installed	Not installed	Not installed	-110 dBm to +17 dBm
Installed	Not installed	Installed	Not installed	-144 dBm to +17 dBm
Not installed	Installed	Not installed	Installed	–110 dBm to +30 dBm
Installed	Installed	Installed	Installed	-144 dBm to +30 dBm
043/143 installed		073/173 installed		0
042/142	041/141	072/172	071/171	Setting range
Not installed	Not installed	Not installed	Not installed	–110 dBm to +17 dBm
Installed	Not installed	Installed	Not installed	-144 dBm to +17 dBm
Not installed	Installed	Not installed	Installed	-110 dBm to $+25 dBm$
Installed	Installed	Installed	Installed	-144 dBm to +25 dBm

Table 5.1-1 Output Level Setting Range

Output level resolution 0.01 dB

An output level out of the range cannot be set, and the error screen is displayed.

Output level setting methods are as follows:

- Output level setting with the numeric keypad
- Output level setting with the rotary knob
- Output level setting with the step keys

The setting methods are explained in the following pages.

5.1.1 Display description

Level or Top>Level

This section describes screens of the level information frame.

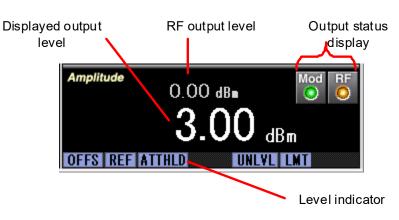


Figure 5.1.1-1 Output Level Setting Screen

	Table 5.1.1-1	Output Level Setting Screen Display I	tem
--	---------------	---------------------------------------	-----

Display	Description	
Displayed output level	Indicates the output level setting value. A value is changed by enabling/disabling Ref (relative level display) or Offset.	
RF output level	Indicates the actually output level.	
Level indicator	Indicates the current status/warning of output level setting.	
Output status display	Mod Green light indicates the output is a modulated signal.	
	RF Orange light indicates the signal is being output.	

Remote command

Query the RF output level

Query

[:SOURce[1]|2]:POWer:CURRent?

Response

<ampl>

Unit: dBm

Parameter

Current output level
Depends on the range set in Table 5.1-1 "Output
Level Setting Range".
0.01 dB
Depends on the range set in Table 5.1-1 "Output
Level Setting Range".

Example of Use

To query the actual output level. POW:CURR? > 10.00

5.1.2 Level indicator

Shows the display items of the level indicator.

Display	Name	Description
OFFS	Level Offset	Indicates the level offset function is On.
REF	Reference	Indicates the relative level display function is On.
ATTHLD	Attenuator Hold	Indicates the ATT Hold function is On.
UNLYL	Unleveled	Indicates the level is out of the guaranteed range.*
ORNG	Out of Range	Indicates the level is out of the setting range.
LMT	Limit	Indicates the Limit Level function is On.
OSYNC	Out of Sync	Indicates that levels of SG1 and SG2 cannot be synchronized due to out of the specified range.

Table 5.1.2-1 Level Indicator

*: No display of "UNLVL" does not guarantee that the level is within the specification.

Remote commands for items in the level indicator frame are as follows:

Remote command Query the status of UNLEVEL Query [:SOURce[1]|2]:POWer:UNLeveled:ERRor?

Response

<status>

Parameter

<status></status>	Measurement status
OOL	Out of Level: The output level is out of the
	guaranteed range.
NORM	Normal: Not unlevel

Example of Use

To query the current operation status. POW:UNL:ERR? > NORM

Chapter 5 Output Level

Remote command	Query the status of OSYNC Query [:SOURce[1] 2]:POWer:SYNC:ERRor?			
	Response			
	<status></status>			
	Parameter			
	<status></status>	Measurement status		
	OOS	Out of Sync: The level synchronization has been disabled.		
	NORM	Normal: The level synchronization is enabled or the synchronization setting is Off.		
	Example of Use			
	To query the curr	To query the current operation status.		
	POW:SYNC:ERR?			
	> NORM			
Remote command	Query the status of ORNG			
	Query			
	[:SOURce[1] 2]	:POWer:RANGe:ERRor?		
	Response			
	<status></status>			
	Parameter			
	<status></status>	Measurement status		
	OOR	Out of Range: The level is out of the setting range.		
	NORM	Normal: The level is within the setting range.		
	Example of Use			
	To query the curr	ent operation status.		
	POW:RANG:ERR?			

5.2 Output Level Setting Method: Level

Level or Top>Level

When you press **Level** of the main function menu or **F2 Level** on the top function menu, the **Level** dialog box is displayed in the active function frame. Enter numbers in the **Level** dialog box to set levels.

 Remote command
 Set the display level

 Command
 Command

 [:SOURce[1]|2]:POWer[:LEVel][:IMMediate][:AMPLitude] <ampl>

Query

[:SOURce[1]|2]:POWer[:LEVel][:IMMediate][:AMPLitude]?

Response

<ampl>

Unit: dBm

Parameter

<ampl></ampl>	Output level
Range	Output level setting range of
	MG3710A/MG3710E/MG3740A
Resolution	0.01 dB
Default	Minimum output level of
	MG3710A/MG3710E/MG3740A
Suffix code	DBM, DM, DBUV, DBUVE
	DBM when omitted
UP	Increase output by one step
DOWN	Decrease output by one step

Refer to 5.2.4 "Output level setting resolution"

Example of Use

To set the SG2 output level to -30.00 dBm. SOUR2:POW -30.00 SOUR2:POW UP SOUR2:POW DOWN SOUR2:POW? > -30.00

Remote command

Set the output level unit

Command
:UNIT[1]|2:POWer <unit>

Query

:UNIT[1]|2:POWer?

Response

<unit>

	Parameter		
	<pre>cunit></pre>	Output level unit	
	DBM	dBm (Default)	
	DBUV	$dB\mu V$ (Termination voltage display)	
	DBUVEMF	dBµVemf (Open voltage display)	
		ubµvenn (open voltage usplay)	
	Details		
	Only the unit changes.		
Example of Use			
	To set the level setting unit to $dB\mu Vemf$ (open voltage display).		
	UNIT: POW DBUVEMF		
	UNIT: POW?		
	> DBUVEMF		
Remote command	Set the displayed ou	tput level with the relative level when the relative	
level display is On			
	Command [:SOURce[1] 2]:POWer:REFerence:AMPLitude <rel_ampl> Query</rel_ampl>		
	[:SOURce[1] 2]:POWer:REFerence:AMPLitude? Response		
	<rel_ampl></rel_ampl>	Unit: dB	
	Parameter		
	<rel_ampl></rel_ampl>	Relative output level	
	Range	Output level setting range of	
		MG3710A/MG3710E/MG3740A	
	Resolution	0.01 dB	
Default Minimum output level of MG3710A/MG3710E/MG3740A		Minimum output level of	
		MG3710A/MG3710E/MG3740A	
	Example of Use		
	To set the relative output to +10.00 dB.		

POW:REF:AMPL 10.00DB
POW:REF:AMPL?
> 10.00

5.2.1 Output level setting with numeric keypad

Enter numbers in the Level dialog box.

Setting method

The procedure for setting output levels with the numeric keypad is as follows.

Example: To set the output level to -47 dBm.

1. Press "–", "**4**", and "**7**" using number buttons of the numeric keypad or numbers on the screen. The screen below is displayed.





 Press the unit F1 dBm on the function key to finalize the numbers and the unit. The "-47.00 dBm" is displayed in the Level dialog box and in the frequency information frame.





The output level setting allows the setting and display with dBm of the power unit and $dB\mu V$ (termination voltage display)/ $dB\mu Vemf$ (open voltage display).

 "-", "1", "2", ".", "3", F2 dBμV
 -12.3 dBμV is set. (Termination voltage display)
 "-", "1", "2", ".", "3", F3 dBμVemf
 -12.3 dBμVemf is set. (Open voltage display)

The digit less than 0.01 dB is rounded.

Chapter 5 Output Level

5.2.2 Changing output level with rotary knob

The rotary knob allows you to increase or decrease a digit of resolution selected by arrow keys

Setting method The procedure for setting the output level with the rotary knob is as follows.

Example: To change the output level from the current –47 dBm to –37 dBm by 1 dB.

1. Use the arrow keys \bigcirc to place the cursor on the digit of 1 dB (Press \bigcirc twice to move it to 1 dB).





2. Rotate the rotary knob to the right to increase the frequency by 1 dB step. Rotate it to the left to decrease the frequency by 1 dB. Using this method, rotate the rotary knob to the right and specify the output level to -37 dBm.

5.2.3 Changing output level with arrow keys

Arrow keys enable you to increase or decrease a digit of resolution selected by arrow keys . The cursor shows the position of the digit.

Default value of output level step: 0.1 dB

Setting method The procedure for setting output level with the arrow keys is as follows.

Example: To increase/decrease the output level from –47 dBm to –55 dBm by 1 dB step.

- 1. Set the output level to -47 dBm.
- 2. Use the arrow keys \bigcirc to place the cursor on the digit of 1 dB.

SG1	-47.00 _{dBm}
	0.10 <u>B</u>

Figure 5.2.3-1 Level Dialog Box

3. Use the arrow keys 🕢 to increase or decrease the frequency by 1 dB step.

5.2.4 Output level setting resolution

Level or Top>Level, Incr Set

Sets a resolution of arrow keys low for setting the output level.

When the MG3710A/MG3710E/MG3740A is in the output level setting mode, press **Incr Set** of the main function key to display the **Increment** dialog box. Enter numbers in the **Increment** dialog box to specify a resolution of arrow keys

Remote command Set the level setting resolution Command Command

[:SOURce]:POWer[:LEVel][:IMMediate]:STEP[:INCRement]
<rel_ampl>

Query

[:SOURce]:POWer[:LEVel][:IMMediate]:STEP[:INCRement]?

Unit: dB

Response

<rel_ampl>

Parameter

<rel_ampl></rel_ampl>	Step level
Range	0.01~dB to $100~dB$
Resolution	0.01 dB
Default	0.1 dB

Example of Use

To set the level step to 3 dB. POW:STEP 3.00DB POW:STEP? > 3.00

Setting method

The procedure for specifying level setting resolution with the arrow keys is as follows:

Example: To change the output level with 0.3 dB of the level setting resolution.

1. Press **Incr Set** while in the Output Level Setting mode to display the **Increment** dialog box in the active function frame.





- 3. Press **F1 dB** to set the level setting resolution and return to the **Level** dialog box.
- 4. Use the arrow keys 🕢 to increase or decrease the frequency by 0.3 dB step.

5.3 Output Level Setting Item

Level or Top>Level

When you press **Level** of the main function key or **F2 Level** in the top function menu, the MG3710A/MG3710E/MG3740A enters the output level setting mode and the **Level** function menu is displayed.

Page	Key No.	Menu Display	Function
1	F1	Reference	Enables/disables the level relative display.
		<u>Off</u> On	Refer to 5.3.1 "Relative level display: Reference".
	F2	Offset	Enables/disables the level offset value.
		<u>Off</u> On	Refer to 5.3.2 "Level offset: Offset".
	F3	Offset Value	Sets the level offset value.
		0.00 dB	Refer to 5.3.2 "Level offset: Offset".
	F4	Limit Level	Enables/disables the Limit Level function.
		<u>Off</u> On	Refer to 5.3.3 "Output level limit".
	F5	Limit Value	Sets the maximum output level.
		25.00 dBm	Refer to 5.3.3 "Output level limit".
	$\mathbf{F7}$	ATT Hold	Sets On/Off of the ATT Hold function.
		<u>Off</u> On	Refer to 5.3.4 "ATT Hold".
	F8	Sync <u>Off</u> On	Function to synchronize the 1st SG with 2nd SG output level settings. It is used when the levels of SG1 and SG2 are to be changed simultaneously. Refer to 5.3.5 "Level synchronization: Sync".
2	F1		Enables/disables the User Correction function.
		Correction <u>Off</u> On	Function to adjust the RF output level of arbitrary frequency points to correct the external loss or external gain. Refer to 5.4 "User Correction: Correction".
	F2		Opens the User Correction function menu to set the
	ΓZ	Configure	user correction table.
		Correction	Refer to 5.4.1 "User correction setting: Configure Correction".
	F3	Calibrate	Performs the level calibration.
		Level	Refer to 5.3.6 "Calibrate Level".
	F4		Enables/disables the Optimize S/N mode.
		Optimize S/N <u>Off</u> On	When it is set to On, CW is output with S/N priority. When it is set to Off, CW is output with distortion characteristic priority. When modulated waves are output, this function has no effect. Refer to 5.3.7 "Optimize S/N".

Table 5.3-1 Level Function Menu

5.3 Output Level Setting Item

Page	Key No.	Menu Display	Function
2	F6	Start BER Measurement	Starts the BER measurement. If MeasureStart is executed during measurement, the measurement is stopped once and restarted. It is displayed when the BER measurement function option is installed. Refer to Chapter 8 "BER Measurement".
	F7	Stop BER Measurement	Stops the BER measurement. It is displayed when the BER measurement function option is installed. Refer to Chapter 8 "BER Measurement".
	F8	Clear BER Count	Clears ErrorCount and SyncLossCount (The measurement is continued).It is displayed when the BER measurement function option is installed. Refer to Chapter 8 "BER Measurement".

Table 5.3-1 Level Function Menu (Cont'd)

5.3.1	Relative leve	el display: Refe	rence rel, >Reference		
			he relative level display.		
			The relative level display displays the output level difference from the reference output level.		
			e relative level display from Off to On, a difference from reference level of output level, is displayed. Above it, level is displayed.		
		RF output level =	display level		
			+ output level when the relative level display is enabled		
		Press F1 Reference	e to switch the level display.		
		Off	Displays output level in absolute values (Default).		
		On	Display output level in relative values. The "REF" is displayed in the level indicator.		
_					
Rem	ote command	Enable/disable the Command	e relative level display		
Rem	iote command	Command	e relative level display :POWer:REFerence:STATe <boolean></boolean>		
Rem	iote command	Command			
Rem	iote command	Command [:SOURce[1] 2] Query			
Rem	iote command	Command [:SOURce[1] 2] Query	:POWer:REFerence:STATe <boolean></boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2]	:POWer:REFerence:STATe <boolean></boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe?</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe?</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter</boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter <boolean></boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1 Output level display</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter <boolean> OFF 0</boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1 Output level display Switches to the absolute value display (Default).</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter <boolean> OFF 0 ON 1 Example of Use</boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1 Output level display Switches to the absolute value display (Default).</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter <boolean> OFF 0 ON 1 Example of Use To switch the outp POW:REF:STAT O</boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1 Output level display Switches to the absolute value display (Default). Switches to the relative display. ut level display to the relative display.</boolean>		
Rem	iote command	Command [:SOURce[1] 2] Query [:SOURce[1] 2] Response <boolean> Parameter <boolean> OFF 0 ON 1 Example of Use To switch the outp</boolean></boolean>	:POWer:REFerence:STATe <boolean> :POWer:REFerence:STATe? 0 or 1 Output level display Switches to the absolute value display (Default). Switches to the relative display. ut level display to the relative display.</boolean>		

Remote command	Query the referen	ce level (output level when the relative level display is
	set to ON) for rela	tive level display
	Query	
	[:SOURce[1] 2]	:POWer:REFerence?
	Response	
	<ampl></ampl>	Unit: dBm
	Parameter	
	<ampl></ampl>	Reference level
	Range	Output level setting range of MG3710A/MG3710E/MG3740A
	Resolution	0.01 dB
	Default	Minimum output level of MG3710A/MG3710E/MG3740A
	Example of Use	
	To query the refer	ence level for relative output level.
	POW:REF?	
	> -5.00	
Setting method		setting procedure is as follows. ase by 7.5 dB with –47 dBm as the reference.
	1. Set the output	t level to -47 dBm.
	then the relat current outpu value is chan output level ("REF" is disp	erence to switch the relative level display to On, and tive level display is enabled with -47 dBm of the at level as the reference. The displayed output level ged from "-47.00 dBm" to "+0.00 dB", and the RF actual output level) is displayed above it. In addition, layed in the level indicator of the screen to indicate the display is enabled.
		Displayed RF output output level level
	SG1 ARB	
	Frequency	DO 000 000 00 GHz 7.50 dB
	SG1	7.50 _{dB}
	Level	Increment 0.10 dB
		Level
		indicator

Figure 5.3.1-1 Relative Level Display

3. Set the relative level to 7.5 dB. At this time the displayed level is also "7.50 dB", however, the actual level output from SG is -47 dBm + 7.5 dB = -39.5 dBm as the RF output level.

5.3.2 Level offset: Offset

Offset

Level or Top>Level, >Offset

Enables/disables the output level offset.

When the frequency offset is on, the output level offset value specified with **F3 Offset Value** is added to the display output level, and the actual output level is displayed above it.

Press F2 Offset to toggle On/Off of the output level offset.		
Off	Does not use the output level offset (Default).	
On	Uses the output level offset. The "OFFS" is	
	displayed in the level indicator.	

When this function is used, the displayed output level is offset with the value specified to LevelOffsetValue. This function is used when the path loss or gain from SG to DUT is corrected.

Output level after offset = RF output level + offset level

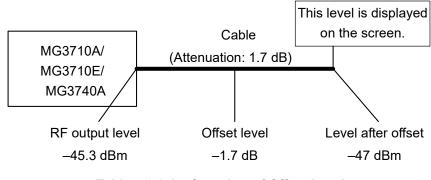


Table 5.3.2-1 Overview of Offset Level

The level offset function cannot perform settings that have frequency characteristics. To change the offset level for each frequency, refer to 5.4 "User Correction: Correction".

Remote command Enable/disable the output level offset Command [:SOURce[1]|2]:POWer[:LEVel][:IMMediate]:OFFSet:STATe <boolean>

Query

[:SOURce[1]|2]:POWer[:LEVel][:IMMediate]:OFFSet:STATe?

Response

```
<boolean>
```

0 or 1

Output level offset On/Off <boolean> OFF|0 Off (Default) ON | 1 On

Example of Use

To set the output level offset to ON. POW:OFFS:STAT ON POW:OFFS:STAT? > 1

Offset level: Offset Value

	Level or Top>Leve Sets the output offse	I, >Offset Value et level.
	Press F3 Offset Value to set a offset level in the Offset Value dialog box in the active function frame.	
	Setting range Resolution Default	-100 to +100 dB 0.01 dB 0 dB
Remote command	Set the output offse	at level
	Command [:SOURce[1] 2]:H <rel_ampl></rel_ampl>	<pre>POWer[:LEVel][:IMMediate]:OFFSet</pre>
	Query [:SOURce[1] 2]:H	<pre>POWer[:LEVel][:IMMediate]:OFFSet?</pre>
	Response	
	<rel_ampl></rel_ampl>	Unit: dB
	Parameter	
	<rel_ampl></rel_ampl>	Output offset level
	Setting range	-100 to +100 dB
	Resolution	0.01 dB
	Default	0.00 dB
	Suffix code	DB
		Handled as DB when omitted.
	Example of Lice	
	Example of Use	Cost level to 15 00 dP

To set the output offset level to -15.00 dB. POW:OFFS -15.00 POW:OFFS? > -15.00

Setting method

The output offset level setting procedure is as follows.

Example: To set for the offset level to be -1.7 dB and output level after offset to be -47 dBm.

1. Press **F3 Offset Value** to display the **Offset Value** dialog box in the active function frame.

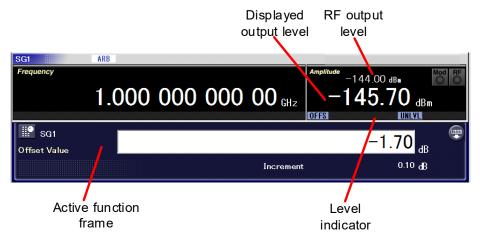


Figure 5.3.2-2 Offset Level Setting

- 2. Press –, 1, ., 7, and F1 dB to set the offset level to -1.7 dB.
- 3. Press **F2 Offset** to set the offset mode to On. The "OFFS" is displayed in the level indicator to indicate the offset setting is enabled.
- 4. Press Level to set the Level setting mode in the active function area, and press –, 4, 7, and F1 dBm to set the output level to -47 dBm. The "-47.00 dBm" is displayed in the displayed output level. At this time, the actual level output from SG is -45.3 dBm as shown in the RF output level.

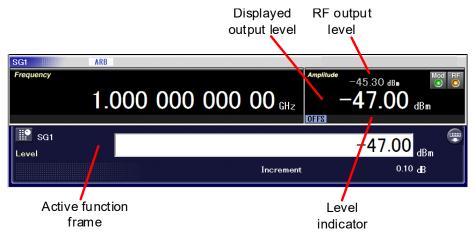


Figure 5.3.2-3 Output Level Confirmation

5.3.3 Output level limit

Output level limit: Limit Level

	Level or Top>Lev	vel, >Limit Level
	Enables/disables the Limit Level function to limit the output level	
	Press F4 Limit Level to set the Limit Level function to On/O Selecting "On" displays "LMT" in the level indicator.	
	Selecting On uis	plays LMT in the level indicator.
	Off	Sets the Limit Level function to Off (Default).
	On	The output level is limited to the level set with
		F5 Limit Value. The "LMT" is displayed in the
		level indicator.
Remote command	Set the Limit Leve	al function On/Off
Remote command	Command	
		:POWer:USER:ENABle <boolean></boolean>
	Query	
	[:SOURce[1] 2]	:POWer:USER:ENABle?
	Response	
	<boolean></boolean>	0 or 1
	Parameter	
	<boolean></boolean>	Limit Level function On/Off
	OFF 0	Off (Default)
	ON 1	On
	Example of Use	
To set the Limit Level function to ON. POW:USER:ENAB ON		evel function to ON.
		ON
	POW:USER:ENAB?	
	> 1	

Output limit level: Limit Value

Level or Top>Level, >Limit Value

Sets the output level limit value (Limit Level).

Press **F5 Limit Value** to set the Limit Level in the **Limit Value** dialog box in the active function frame.

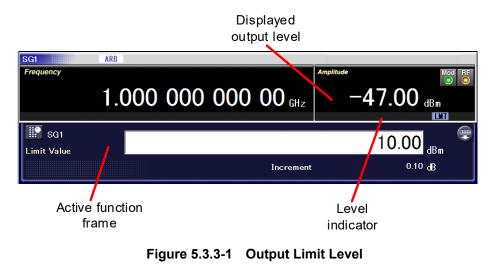
	Setting range	 RFLevelMin + LevelOffset + UnitCoef to RFLevelMax + LevelOffset + UnitCoef (with the output level display) RFLevelMax: Maximum output level of MG3710A/MG3710E/MG3740A RFLevelMin: Minimum output level of MG3710A/MG3710E/MG3740A LevelOffset: Offset level The UnitCoef value is as follows: When LevelUnit is dBm: UnitCoef = 0 When LevelUnit is dBµV (Term): UnitCoef = 106.99 When LevelUnit is dBµV (EMF): UnitCoef = 113.01
	Resolution Default	0.01 dB RFLevelMax + LevelOffset + UnitCoef
Remote command	Command [:SOURCe[1] 2]: Query	ellimit value (Limit Level) POWer:USER:MAX <ampl> POWer:USER:MAX?</ampl>
	Parameter	
	<ampl></ampl>	Maximum output level
	Setting range	See above.
	Resolution	See above.
	Default	See above.
	Suffix code	DBM, DM, DBUV, DBUVEMF

Handled as DBM when omitted.

	Example of Use
	To set the Limit Level to 30 dBm.
	POW:USER:MAX 30
	POW:USER:MAX?
	> 30.00
Setting method	The Limit Level setting procedure is as follows. Example: To set the Limit Level to 10 dBm.

2.

1. Press **F5 Limit Value** to display the **Limit Value** dialog box in the active function frame.



- Press 1, 0, and F1 dBm to set the Limit Value to 10 dBm.
- Press F4 Limit Level to set the Limit Level function to On. The "LMT" is displayed in the level indicator to indicate the Limit Level is set.

5.3.4 ATT Hold

Level or Top>Level, >ATT Hold

Enables/disables the ATT Hold function to prevent the signal dropout on ATT switching.

ress **F7 ATT Hold** to set the ATT Hold function to On.

Press F/ AII Hold to se	et the ATT Hold function to On.
Off	Sets the ATT Hold function to Off(Default).
	Signal dropouts occur on ATT switching.
On	Sets the ATT Hold function to On. Signal
	dropouts do not occur on ATT switching, however,
	the settable level range is limited to ± 10 dB. The
	"ATTHLD" is displayed in the level indicator.

Signal dropouts which occur on ATT switching may generate the following problems.

- Increase in BER
- Damage with spike noise entry to devices
- Level gap by ATT switching within VSG (Even if a change by 0.01 dB is given, the level is not changed by 0.01 dB due to ATT switching errors).

This function fixes ATT and adjust the output level to prevent these problems.

This function is restricted as follows:

- CAL is not executed automatically each time the output level is changed.
- The level adjustable range is ±10 dB to the output level when this function is set to On.
- IQ Calibration function (refer to 7.6.1 "IQ Calibration") is not available.
- This setting is not available in the following case(s).
 Output level is less than -127 dBm
 Optimize S/N is On
 Sweep/List is in use
 Sequence Mode waveform file is in use

Remote command Set the ATT Hold function On/Off Command

[:SOURce[1]|2]:POWer:ATTenuation:AUTO <boolean>

Query

[:SOURce[1]|2]:POWer:ATTenuation:AUTO?

Response

<boolean>

0 or 1

Chapter 5 Output Level

Parameter

<boolean></boolean>	On/Off status of ATT Hold function
OFF 0	Off (Default)
ON 1	On

Example of Use

To set the ATT Hold function to ON. POW:ATT:AUTO ON POW:ATT:AUTO? > 1

5.3.5 Level synchronization: Sync

	 or Top>Level, >Sync Enables/disables the function to synchronize the 1st SG with 2nd SG output level settings. It is used when the levels of SG1 and SG2 are to be changed simultaneously. This is available when the MG3710A/MG3710E/MG3740A-062/162/064/164/066/166 is installed. 				
	Press F8 Sync to set the level synchronization function to On.				
	The level synchronization function is parallel. When you change the SG-side level specified for SG Port, the changed value is added to the other SG-side level.				
	Off	Sets the level synchronization function to Off (Default).			
	On	Sets the level synchronization function to On. The output level settings are synchronized between SG1 and SG2.			
Remote command	Enable/disable the level synchronization function Command				
	[:SOURce]:POWer:SYNC:STATe <boolean></boolean>				
	Query				
	[:SOURce]:POWer:SYNC:STATe?				
	Response				
	<boolean></boolean>	0 or 1			
	Parameter				
	<boolean></boolean>	On/Off of the level synchronization function			
	OFF 0	Off (Default)			
	ON 1	On			
	Example of Use				
	To set the level synchronization function to ON.				
	POW:SYNC:STAT ON POW:SYNC:STAT?				
	> 1				
	~ ±				

Chapter 5 Output Level

5.3.6 Calibrate Level

Level or Top>Level, >→>Calibrate Level,

or Cal > Calibrate Level

Calibrates the output level.

Pressing \bigcirc switches the function menu to the second page, and pressing **F3 Calibrate Level** calibrates the output level.

In the normal operation status, signals with the stable level are always output by the ALC loop circuit.

However, when the modulation is set to On, the ALC loop circuit is held and becomes nonfunctional. If the MG3710A/MG3710E/MG3740A is used with the same setting for a long period, level calibration is recommended to eliminate fluctuations with temperature drift.

In addition, even when the modulation is set to On, if any of the following operations is executed, the level is calibrated automatically.

- Frequency change
- Output level change
- Pattern selection

Notes:

- Execute Calibrate Level while the device to be tested is connected to the RF connector of the MG3710A/MG3710E/MG3740A.
- Executing Calibrate Level with the RF connector opened may degrade the level accuracy of output signals because of reflection.

 Remote command
 Calibrate the output level

 Command
 [:SOURce[1]|2]:POWer:ALC:SEARch [ONCE]

 Example of Use
 To calibrate the output level.

POW:ALC:SEAR

5.3.7 Optimize S/N

Level or Top>Level, >>>>Optimize S/N

The function to improve the S/N of CW signals. When it is set to On, CW is output with S/N priority. When it is set to Off, CW is output with distortion characteristic priority. When modulated waves are output, this function has no effect.

Press \bigcirc to switch the function menu to the second page, and press **F4 Optimize S/N** to set the Optimize S/N function to On.

OffDistortion characteristic has priority (Default).OnS/N has priority.

Remote command

Enables/disables the Optimize S/N function Command

[:SOURce[1]|2]:POWer:NOISe[:STATe] <boolean>

Query

[:SOURce[1]|2]:POWer:NOISe[:STATe]?

Response

<boolean>

0 or 1

Parameter

<boolean> OFF|0 ON|1 On/Off of the Optimize S/N function Off (Default) On

Example of Use

To set the Optimize S/N function to ON. POW:NOIS ON POW:NOIS? > 1

5.4 User Correction: Correction

 $(__evel)$ or Top>Level, > \longrightarrow >Correction

This function is to adjust the RF output level of arbitrary frequency points to correct the external loss or external gain.

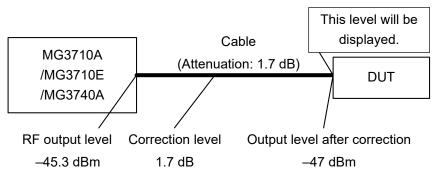
Interpolate the correction value linearly with a logarithm. When it becomes the value between resolutions, drop the digits less than the resolution.

For the frequency which is smaller than the minimum frequency of the correction value data, use the correction value data of the minimum frequency.

For the frequency which is higher than the maximum frequency of the correction value data, use the correction value of the maximum frequency.

For correction for the baseband, use the correction value corresponding to the center frequency of the baseband.(Even if multiple correction points exist in the baseband, use the correction value corresponding to 0 Hz of the baseband.)

When this function is used, the output level is offset with the value specified to the correction level and used for correction of path loss or gain from SG to DUT.



Output level after correction = RF output level + correction level

Figure 5.4-1 Overview of User Correction

	Press To switch the function menu to the second page, and press F1 Correction to set the user correction function to On.			
	Off	Sets the user correction function to Off. (Default)		
	On	Sets the user correction set with F2 Configure Correction to On. The "CORR" is displayed on the common indicator.		
Demote commond				
Remote command	Set the user correction to On/Off			
	Command			
	[:SOURce[1] 2]:CORRection[:STATe] <boolean></boolean>			
	Query [:SOURce[1] 2]:CORRection[:STATe]?			
	Response			
	<boolean></boolean>	0 or 1		
	Parameter			
	<boolean></boolean>	On/Off of the user correction function		
	OFF 0	Off (Default)		
	ON 1	On		
	Example of Use			

To set the user correction function to ON. CORR ON CORR? > 1

5.4.1 User correction setting: Configure Correction

Level or Top>Level, $> \rightarrow$ >Configure Correction Sets the user correction value.

Press \bigcirc to switch the function menu to the second page, and press F2 Configure Correction to display the Correction Table and Correction function menu.

To set the user correction value, you can set the correction value measured in advance to the Correction Table or measure the correction value with the power sensor connected to the MG3710A/MG3710E/MG3740A to create the correction table.

Selecting the item to be set with the cursor on the Table and pressing **F1 Edit Item** displays the dialog box for setting. For the setting method, refer to 5.4.2 "Edit Item".

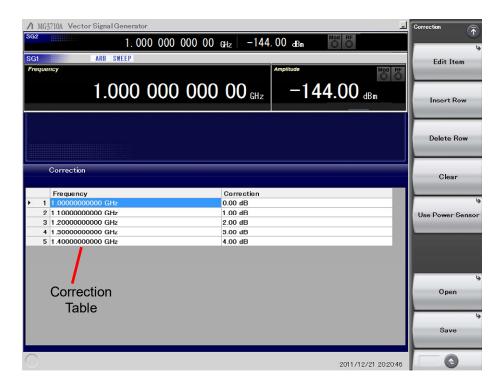


Figure 5.4.1-1 Correction Table

5.4 User Correction: Correction

Page	Key No.	Menu Display	Function		
1	F1	Edit Item	Sets the user correction table correction value.		
			Refer to 5.4.2 "Edit Item".		
	F2	Insert Row	Adds the correction value to the user correction table.		
			Refer to 5.4.3 "Adding correction data: Insert Row".		
	F3	Delete Row	Deletes the correction value in the user correction table.		
			Refer to 5.4.4 "Deleting correction data: Delete Row".		
	F4		Deletes the user correction table expanded in the		
		Clear	memory.		
			Refer to 5.4.5 "Deleting correction table: Clear".		
	F5 Displays		Displays the Use Power Sensor function menu.		
		Use Power Sensor	They are not displayed when the Power Sensor is		
			not connected.		
			Refer to 5.5 "Use Power Sensor".		
	$\mathbf{F7}$	Onon	Recalls the saved user correction table.		
		Open	Refer to 5.4.6 "Recalling user correction table: Open".		
	F8	Sava	Saves the user correction table.		
	Save		Refer to 5.4.7 "Saving user correction table: Save ".		

Table 5.4.1-1 Correction Function Menu

Chapter 5 Output Level

5.4.2 Edit Item				
	□ Or Top>Level, >→>Configure Correction>Edit Item			
	Sets the correction value of the user correction table.			
Remote command	Add the correction	a value to the correction table		
	Command			
	[:SOURce[1] 2]:CORRection:FLATness:PAIR <freq>,<rel_ampl></rel_ampl></freq>			
	Parameter			
	<freq></freq>	Frequency		
	Setting range	Frequency setting range of MG3710A/MG3710E /MG3740A		
	Resolution	0.01 Hz		
	Default	1 GHz		
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ		
		Handled as HZ when omitted.		
	<rel_ampl></rel_ampl>			
	Setting range	-100 dB to +100 dB		
	Resolution	0.01 dB		
	Default	–999.00 (Undefined)		
		Undefined is displayed when the value has not		
		been set.		
		–999.00 dB can be assigned as a numeric value but the Undefined row is not used at correction.		
	Suffix code	DB		
		Handled as DB when omitted.		

Example of Use

To add 1 GHz of the frequency and 4 dB of the correction value to the correction table. $\mbox{CORR:FLAT:PAIR 1GHZ,4}$

Setting method

The user correction value setting procedure is as follows.

Example: To create a user correction table under the following conditions.

- Frequency: 2.412 GHz
- Correction value: 3 dB
- (1) Setting the frequency

▲ MG3710A Vector Signal Generator			
^{SG2} 1 000 000 000	00 _{GHz} -144.		
SG1 ARB			
Frequency		Amplitude	GHz GHz
1.000 000 0	00 00	-144.00 dBm	
	GITZ GITZ		MHz
SG1	1		
		2.412	
Frequency			kHz
	Increment	100.000 00 kHz	
Correction			
			Hz
Frequency	Correction		
1 1.0000000000 GHz	0.00 dB		
2 1.000000000 GHz	Undefined		
3 1.1000000000 GHz	1.00 dB		
4 1.2000000000 GHz	2.00 dB		
5 1.3000000000 GHz	3.00 dB		
6 1.4000000000 GHz	4.00 dB		
			Cancel
0		2011/12/16 1	35352

Figure 5.4.2-1 Frequency Setting

- 1. Align the cursor with row 1 and press **F2 Insert Row** to copy only the frequency and add a new input row under the cursor row. The cursor moves to the new row automatically.
- Confirm that the cursor is at "Frequency". Press F1 Edit Item to display Frequency dialog box and Enter Item function menu.

Page	Key No.	Menu Display	Function	
1	F1	Enter Item	Edits values and returns to the previous menu.	
	F8	Cancel	Returns to the previous menu.	

 Table 5.4.2-1
 Enter Item Function Menu

- 3. Enter "2.412" of frequency to the **Frequency** dialog box.
- 4. Press the unit **F1 GHz** on the function menu to set a frequency and close the **Correction Table** dialog box. At this time the order of user correction tables changes in the order of frequencies. In this case, moves to row 6.
- (2) Setting the correction level

▲ MG3710A Vector Signal Generator			_	Â
^{SG2} 1.000 000 000 00	GHz -144	.00 dBm		
SG1 ARB				dB
Frequency		Amplitude	Mod RF	u b
1.000 000 000	00 GHz	-144.00 _{dBm}		
SG1 Correction		3	Ģ	
	Increment	0.10 dB		
Correction				
Frequency	Correction			
1 1.0000000000 GHz	0.00 dB		_	
2 1.1000000000 GHz	1.00 dB		_	
3 1.2000000000 GHz 4 1.3000000000 GHz	2.00 dB 3.00 dB			
5 1.4000000000 GHz	4.00 dB		_	
→ 6 2.41200000000 GHz	Undefined			
	Contract in the ca		- 2	
				Cancel
				Cancer
0		2011/12/16	14:02:45	•

Figure 5.4.2-2 Correction Level Setting

- 1. Place the cursor on the "Correction" of the sixth row.
- 2. Press **F1 Edit Item** to display **Correction** dialog box and Enter Item function menu.
- 3. Enter "3" of correction level to the **Correction** dialog box.
- 4. Press the unit **F1 dB** on the function menu to set a correction level and close the **Correction** dialog box.

5.4.3 Adding correction data: Insert Row

Level or Top>Level, $> \rightarrow$ >Configure Correction>Insert Row Inserts a row to add the correction value to the correction table.

Press **F2 Insert Row** at the User Correction function menu to copy only the frequency and add a correction data setting row at the row under the Correction Table cursor row. Also the Correction function menu-related switch is displayed additionally.

_		Frequency	Correction
	1	1.0000000000 GHz	3.00 dB
	2	1.1000000000 GHz	3.10 dB
	3	1.20000000000 GHz	3.20 dB
	4	1.4000000000 GHz	3.40 dB
	5	1.5000000000 GHz	3.50 dB
		Correction	
		Correction Frequency	Correction
			Correction 3.00 dB
	1	Frequency	
	1 2	Frequency 1.0000000000 GHz	3.00 dB
	1 2 3	Frequency 1.0000000000 GHz 1.10000000000 GHz	3.00 dB 3.10 dB
	1 2 3 4 5	Frequency 1.0000000000 GHz 1.1000000000 GHz 1.2000000000 GHz	3.00 dB 3.10 dB 3.20 dB

Figure 5.4.3-1 Adding Correction Data

5.4.4 Deleting correction data: Delete Row

Level or Top>Level, $> \rightarrow$ >Configure Correction>Delete Row One row of the correction value of the correction table expanded in the

memory is deleted.

Press **F3 Delete Row** at the User Correction function menu to delete the correction data of the Correction Table cursor row.

The rows below the deleted row will move up to the upper rows in sequence.

Frequency	Correction
1 1.0000000000 GHz	3.00 dB
2 1.1000000000 GHz	3.10 dB
3 1.2000000000 GHz	3.20 dB
4 1.3000000000 GHz	3.30 dB
5 1.4000000000 GHz	3.40 dB
6 1.5000000000 GHz	3.50 dB
Correction	
Correction	
Correction Frequency	Correction
	Correction 3.00 dB
Frequency	
Frequency 1 1.000000000 GHz	3.00 dB
Frequency 1 1.000000000 GHz 2 1.1000000000 GHz	3.00 dB 3.10 dB

Figure 5.4.4-1 Deleting Correction Data

5.4.5 Deleting correction table: Clear

Level or Top>Level, $> \rightarrow$ >Configure Correction>Clear Deletes all of the correction table expanded in the memory.

Remote command Delete all of the correction table Command

[:SOURce[1]|2]:CORRection:FLATness:PRESet

Example of Use

To delete all of the correction table. CORR:FLAT:PRES

Setting method

Press F4 Clear to delete all data in the correction table.

Frequency	Correction
1 1.0000000000 GHz	3.00 dB
2 1.1000000000 GHz	3.10 dB
3 1.2000000000 GHz	3.20 dB
4 1.3000000000 GHz	3.30 dB
5 1.4000000000 GHz	3.40 dB
6 1.5000000000 GHz	3.50 dB
Correction	
Frequency	Correction

Figure 5.4.5-1 Deleting Correction Table

5.4.6 Recalling user correction table: Open

Level or Top>Level, $> \rightarrow$ >Configure Correction>Open Recalls the saved user correction table.

Remote command	Recall the user correction table Command		
	:MMEMory [1] 2:LOAD:CORRection:FLATness		
	<string>[,<device>]</device></string>		

Parameter

File name without an extension
Character string within 100 characters enclosed
by double quotes (" ") or single quotes (' ')
(excluding extension)
Drive number
A to Z, currently selected drive when omitted

Example of Use

To recall the user correction table file with the file name of "ABC" from the D drive. MMEM:LOAD:CORR:FLAT "ABC",D

Setting methodThe recalling procedure is as follows.1.Press F7 Open to open the Correction Recall function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Specifies the Drive containing the user correction table to recall.
	$\mathbf{F7}$	Open	Recalls the user correction table file in the folder specified in Drive and expands it in the memory.
	F8	Cancel	Returns to the previous menu.

Table 5.4.6-1 Correction Recall Function Menu

- 2. Press **F1 Drive** to select a drive containing the user correction table file is saved to recall.
- 3. The **Correction Recall** dialog box is displayed in the active function frame, and File List is displayed in the function display frame.

5.4 User Correction: Correction

	LastParameterSetting_correctionSg1	
Correction Recall		
File List		
Path : C:\Anritsu\MG37	0A\User Data\Corrections\	
Name		
Corr20111214_000		
Corr20111216_001		
Corr20111216_002		
LastParameterSetting_co		
LastParameterSetting_co		
Param_20111202_000_cor		
Param_20111202_000_cor		
Param20111215_001_corr Param20111215_001_corr		

Figure 5.4.6-1 Correction Recall Dialog Box

- 4. Use the rotary knob or arrow keys to select the user correction table file to recall.
- Press F7 Open to recall the selected user correction table file. Press F8 Cancel to return to the previous screen without recalling the user correction table file.

Notes:

- File names are listed in alphanumeric order.
- If no user correction table file exists, "File not found" is displayed.

5.4.7 Saving user correction table: Save

Level or Top>Level, $> \rightarrow$ >Configure Correction>Save Saves the user correction table with set parameters.

Remote command

Save the user correction table Command :MMEMory[1]|2:STORe:CORRection:FLATness [<string>[,<device>]]

Parameter

<string></string>	File name without an extension Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ') (excluding extension)
	The following characters cannot be used:
	<pre>\ / : * ? `` " ` ' < > Automatically named as "Corr[Date]_[Additional number].csv" when omitted.</pre>
	The additional number will be the minimum
	three-digit numerical number within 000 to 999 which does not exist.
<device></device>	Drive number
Options	A to Z, currently selected drive when omitted

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\Corrections\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Example of Use

To save the user correction table file with the file name of "ABC" to the D drive.

MMEM:STOR:CORR:FLAT "ABC",D

Setting method The user correction table saving procedure is as follows.

Example: To name the user correction table currently displayed as "W-LAN" and save it.

1. Press **F8 Save** to open the Correction Save function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Specifies a Drive where the user correction table is saved.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F7	Save	Saves the user correction table in the folder specified with Drive in csv format.
	F8	Cancel	Returns to the previous menu.

 Table 5.4.7-1
 Correction Save Function Menu

- 2. The **Correction Save** dialog box is displayed in the active function frame.
- 3. Press **F1 Drive** to select a destination drive. File List of the selected drive is displayed in the function display frame.

	Corr20111221_003		
Correction Save	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z , . @ a b c d e f g h i j k l m n o p q r s t u v w x y z ; ' ~ 0 1 2 3 4 5 6 7 8 9 ! # \$ \$ & () + - = [] ^ { }		
File List			
Path : C:\Anritsu\MG37	10A\User Data\Corrections\		
Name			
Corr20111214.000			
Corr20111216_001			
Corr20111216_002			
LastParameterSetting_c	orrectionSg1		
LastParameterSetting_c	LastParameterSetting_correctionSg2		
	Param_20111202_000_correctionSg1		
Param_20111202_000_coi	Param_20111202_000_correctionSg2		
Param20111215_001_com Param20111215_001_com			

Figure 5.4.7-1 Correction Save Dialog Box

- 4. Enter a file name in the **Correction Save** dialog box. By default, the "CorrDate_Additional number" is displayed in the text box.
- 5. Enter "W-LAN" in the dialog box and press **F7 Save**. The user correction table file with the entered file name is saved, and the **Correction Save** dialog box closes.

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Destination path: Anritsu\MG3710A\User Data\Corrections\
- Default destination name: Corr[Date]_[Additional number].csv The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
- Characters available for file names are displayed on the character palette.
- The following characters cannot be used:
 / : * ? " " ' < > |
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

5.5 Use Power Sensor

Level or Top>Level, $> \rightarrow >$ Configure Correction>Use Power Sensor The power sensor to be used for the user correction table is set.

Press **F5 Use Power Sensor** in the Correction function menu to open the USB Power Sensor function menu.

Page	Key No.	Menu Display	Function
1	F1	Connection Setting	Displays the PM Connection function menu. Refer to 5.5.1 "Connection Settings".
	F2	Settings	Displays the Settings function menu. Refer to 5.5.2 "Settings".
	F4	Zero Sensor	Executes the zero level adjustment for the power sensor. Refer to 5.5.3 "Zero adjustment: Zero Sensor".
	F6	Create Correction File	Executes the calibration measurement with the power sensor and creates the user correction table file. Refer to 5.5.4 "Creating correction table: Create Correction File".

Table 5.5-1 USB Power Sensor Function Menu

5.5.1 Connection Settings

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Connection Settings

Press **F1 Connection Settings** in the Use Power Sensor function menu to open the PM Connection function menu.

Page	Key No.	Menu Display	Function
1	F1	COM Port 2	Sets the COM Port number allocated to the power sensor.
	F2	Model MA24106A	Displays the Model function menu for selection of the model name of the power sensor to be used.
	F3	Open Device Manager	Displays Windows Device Manager. This is used for checking the COM port number of connected power sensor.

Table 5.5.1-1 PM Connection Function Menu

COM Port setting: COM Port

Level or Top>Level, > > Configure Correction>Use Power

Sensor>Connection Settings>COM Port

Sets the COM Port number of the power sensor.

Press **F1 COM Port** to display the **COM Port** dialog box in the active function frame. Enter numbers and press **F1 Enter** to set the COM Port number.

Setting range	2 to 8
Resolution	1
Default	2

Remote command

Set the COM Port number

Command

[:SOURce[1]|2]:CORRection:PMETer:COMMunicate:USB:PORT
<ext integer>

Query

[:SOURce[1]|2]:CORRection:PMETer:COMMunicate:USB:PORT?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	COM Port number	
Setting range	2 to 8	
Resolution	1	
Default	2	
Example of Use		
To set the COM Port nu	mber of SG1 power sensor to 8.	
CORR:PMET:COMM:USB	:PORT 8	
CORR:PMET:COMM:USB	:PORT?	
> 8		

Model setting :Model

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Connection Settings>Model

Selects the model name of the power sensor.

Press **F2 Model** to display the Model function menu, and press the function key of the power sensor to be used to set the model.

Page	Key No.	Menu Display	Function
1	F1	MA24104A	600 MHz to 4 GHz
	F2	MA24105A	350 MHz to 4 GHz
	F3	MA24106A	50 MHz to 6 GHz (Default)
	F4	MA24108A	10 MHz to 8 GHz
	F5	MA24118A	10 MHz to 18 GHz
	F6	MA24126A	10 MHz to 26 GHz

Table 5.5.1-2 Model Function Menu

Notes:

- The range of frequencies that can be used for user correction are listed in Table 5.5.2-2 Frequency Setting Range.
- If Windows Device Manager does not display the available USB power sensor, the older version of PowerXpert software may be the cause.

Download and install the latest PowerXpert software from Anritsu website.

• Use PowerXpert Ver. 2.11 or later for MA24105A, use PowerXpert Ver. 2.00 or later for other sensor.

Remote command

Select the model name

Command

[:SOURce[1]|2]:CORRection:PMETer:MODel Ma24104A|Ma24105A|Ma24106A|Ma24108A|Ma24118A|Ma24126A

Query

[:SOURce[1]|2]:CORRection:PMETer:MODel?

Response

<model>

Parameter

<model> Options Power sensor model name MA24104A, MA24105A, MA24106A (Default), MA24108A, MA24118A, MA24126A

Example of Use

To select the MA24118A for the power sensor of SG1. CORR:PMET:MOD MA24118A CORR:PMET:MOD? > MA24118A

5.5.2 Settings

Press **F2 Settings** in the Use Power Sensor function menu to open the Settings function menu.

Page	Key No.	Menu Display	Function
1	F1	Start Freq 1.00000000000 GHz	Specifies the start frequency when the correction table is created with the power sensor.
	F2	Stop Freq 1.00000000000 GHz	Specifies the stop frequency when the correction table is created with the power sensor.
	F3	Level Offset <u>Off</u> On	Sets the level offset adding On/Off for the power sensor reading.
	F4	Level Offset Value 0.00 dB	Sets the offset level value to be added to the power sensor reading.
	F5	Correction Points 2	Sets the measurement point number when the correction table is created with the power sensor.
	F6	Averaging <u>Off</u> On	Sets the averaging On/Off for the measurement values with the power sensor.
	$\mathbf{F7}$	Averaging Count 10	Sets the averaging count for the measurement values with the power sensor.

Table 5.5.2-1 Settings Function Menu

Start Freq

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Settings>Start Freq

Sets the start frequency when the correction table is created with the power sensor.

Press **F1 Start Freq** in the Settings function menu to display the **Start Freq** dialog box in the active function frame. Enter the numbers and press the unit key of the Unit function menu to set the start frequency.

Setting range	See Table 5.5.2-2 Frequency Setting Range.
Resolution	0.01 Hz
Default	1 GHz

Table 5.5.2-2	Frequency	Setting	Range
---------------	-----------	---------	-------

		Maximum Value		
Power Sensor	Minimum Value	MG3710A/I	MG3710E/MG374	0A Options
		032/062/162	034/064/164	036/066/166
MA24104A	$600 \mathrm{~MHz}$	$2.7~\mathrm{GHz}$	4 GHz	4 GHz
MA24105A	$350 \mathrm{~MHz}$	$2.7~\mathrm{GHz}$	4 GHz	$4~\mathrm{GHz}$
MA24106A	$50~\mathrm{MHz}$	$2.7~\mathrm{GHz}$	$4 \mathrm{~GHz}$	$6~{ m GHz}$
MA24108A	$10 \mathrm{~MHz}$	$2.7~\mathrm{GHz}$	$4 \mathrm{~GHz}$	$6~{ m GHz}$
MA24118A	$10 \mathrm{~MHz}$	$2.7~\mathrm{GHz}$	4 GHz	$6~{ m GHz}$
MA24126A	$10 \mathrm{~MHz}$	$2.7~\mathrm{GHz}$	4 GHz	$6~{ m GHz}$

Remote command

Set the start frequency

Command

[:SOURce[1]|2]:CORRection:FLATness:STEP:STARt <freq>

Query

[:SOURce[1]|2]:CORRection:FLATness:STEP:STARt?

Response

<freq>

Unit: Hz

Parameter

<freq> Start frequency Setting range Refer to Table 5.5.2-2 Frequency Setting Range. Resolution 0.01 Hz Default 1 GHz Suffix code HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ Handled as HZ when omitted.

	Example of Use			
	To set the start free	To set the start frequency to 600 MHz.		
	CORR:FLAT:STEP:	STAR 600MHZ		
	CORR:FLAT:STEP:	STAR?		
	> 60000000.00			
Stop Freq				
	Level or Top>Leve	el, >⊖→>Configure Correction>Use Power		
	Sensor>Settings>	Stop Freq		
	Sets the stop frequ power sensor.	ency when the correction table is created with the		
	Freq dialog box in	in the Settings function menu to display the Stop the active function frame. Enter the numbers and of the Unit function menu to set the stop frequency.		
	Setting range	Refer to Table 5.5.2-2 Frequency Setting Range.		
	Resolution	0.01 Hz		
	Default	1 GHz		
Remote command	Set the stop freque	ency		
	Command			
	[:SOURce[1] 2]:	CORRection:FLATness:STEP:STOP <freq></freq>		
	Query			
	[:SOURce[1] 2]:	CORRection:FLATness:STEP:STOP?		
	Response			
	<freq></freq>	Unit: Hz		
	Parameter			
	<freq></freq>	Refer to Table 5.5.2-2 Frequency Setting Range.		
	Setting range	Frequency range of the power sensor		
	Resolution	0.01 Hz		
	Default	1 GHz		
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ		
		Handled as HZ when omitted.		
	Example of Use			
	To set the stop freq	uency to 5 GHz.		
	CORR:FLAT:STEP:	STOP 5GHZ		
	CORR:FLAT:STEP:	STOP?		
	> 500000000.00)		

Level Offset

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Settings>Level Offset

Enables/disables the offset level adding for the power sensor reading.

Press **F3 Level Offset** in the Settings function menu to set the level offset On/Off.

Off	Does not add the offset level (Default).
On	Adds the offset level.

When this function is used, the displayed power sensor value is offset with the value specified to Level Offset Value. It is used when the path loss or gain from SG to DUT is corrected.

Power sensor reading after offset = power sensor reading + offset level

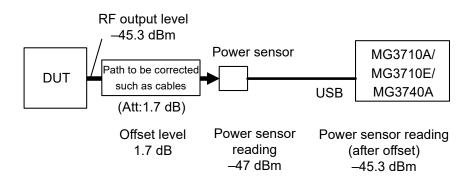


Figure 5.5.2-1 Overview of Offset Level

Remote command

Set the level offset to On/Off

Command

[:SOURce[1]|2]:CORRection:PMETer:GAIN2:STATe <boolean>

Query

[:SOURce[1]|2]:CORRection:PMETer:GAIN2:STATe?

0 or 1

Response

<boolean>

Parameter

<boolean></boolean>	On/Off of the level offset
OFF 0	Off (Default)
ON 1	On

	Example of Use To set the level offset to CORR: PMET: GAIN2: ST CORR: PMET: GAIN2: ST > 1	AT ON	
Level Offset Value			
		Configure Correction>Use Power Offset Value	
	Sensor>Settings>Level Offset Value Sets the offset level value to be added to the power sensor reading.		
	Press F4 Level Offset Value in the Settings function menu to display the Level Offset Value dialog box in the active function frame. Enter the numbers and press the unit key of the Unit function menu to set the offset level value.		
	Setting range	-100 dB to 100 dB	
	Resolution	0.01 dB	
	Default	0 dB	
Remote command	Set the offset level Command [:SOURce[1] 2]:CORRection:PMETer:GAIN2[:INPut][:MAGNitud e] <rem_ampl></rem_ampl>		
	Query [:SOURce[1] 2]:COF e]?	Rection:PMETer:GAIN2[:INPut][:MAGNitud	
	Response <rem_ampl></rem_ampl>		
	Parameter		
	<rem_ampl></rem_ampl>	Offset level	
	Setting range	-100 dB to 100 dB	
	Resolution	0.01 dB	
	Default	0 dB	
	Example of Use		
	To set the offset level to 20 dB.		
	CORR:PMET:GAIN2 20		
	CORR:PMET:GAIN2?		
	> 20.00		

Correction Points

rection Foints					
	Level or Top>Level,	> >Configure Correction>Use Power			
	Sensor>Settings>Correction Points				
	Sets the measurement point number when the correction table is created				
		with the power sensor.			
	The measurement po	The measurement point interval is by the following:			
	(Start frequency – sto	(Start frequency – stop frequency) / (correction point – 1)			
	Press F5 Correction Points in the Settings function menu to display the Correction Points dialog box in the active function frame. Enter the numbers and press F1 Enter to set the correction points.				
	Setting range	2 to 4096			
	Resolution	1			
	Default	2			
Remote command	Remote command Set the measurement point number Command [:SOURce[1] 2]:CORRection:FLATness:STEP:POINts <ext_integer> Query [:SOURce[1] 2]:CORRection:FLATness:STEP:POINts Response <ext_integer> Parameter</ext_integer></ext_integer>				
	<ext_integer></ext_integer>	Measurement point number			
	Setting range	2 to 4096			
	Resolution	1			
	Default	2			

Example of Use

To set the measurement point number to 1000 points. CORR:FLAT:STEP:POIN 1000 CORR:FLAT:STEP:POIN? > 1000

Averaging				
	Level or Top>Le	vel, > >> Configure Correction>Use Power		
	Sensor>Settings:	>Averaging		
	Enables/disables	the averaging for the measurement value with the		
	power sensor.			
	Pressing F6 Avera	aging in the Setting function menu sets the averaging.		
	Off	Does not execute the averaging(Default).		
	On	Executes the averaging.		
Remote command	Set the averaging to On/Off			
	Command			
	[:SOURce[1] 2]:CORRection:PMETer:AVERage[:STATe]			
	<boolean></boolean>			
	Query			
	[:SOURce[1] 2]]:CORRection:PMETer:AVERage[:STATe]?		
	Response			
	<boolean></boolean>	0 or 1		
	Parameter			
	<boolean></boolean>	Averaging On/Off		
	OFF 0	Off (Default)		
	ON 1	On		
	Example of Use			
	To set the averagi	ing for SG2 power sensor measurement to On.		
	SOUR2:CORR:PME	ET:AVER?		
	> 1			

Averaging Count

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Settings>Averaging Count

Sets the averaging count for the measurement values with the power sensor.

Press **F7** Averaging Count in the Settings function menu to display the Averaging count dialog box in the active function frame. Enter the numbers and press **F1** Enter to set the averaging count.

Setting range	$1 \mbox{ to } 2048$
Resolution	1
Default	10

Remote command Set the averaging count Command [:SOURce[1]|2]:CORRection:PMETer:AVERage:COUNt

<ext_integer>

Query

[:SOURce[1]|2]:CORRection:PMETer:AVERage:COUNt?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	Measurement point number
Setting range	1 to 2048
Resolution	1
Default	10

Example of Use

To set the averaging count for SG2 power sensor measurement to 1024.

SOUR2:CORR:PMET:AVER:COUN 1024

SOUR2:CORR:PMET:AVER:COUN?

> 1024

5.5.3 Zero adjustment: Zero Sensor

Level or Top>Level, >→>Configure Correction>Use Power Sensor>Zero Sensor

Executes the zero adjustment for the power sensor.

Press **F4 Zero Sensor** in the Use Power Sensor function menu to execute the zero adjustment for the power sensor.

"Zeroing the Sensor" is displayed and the output of the MG3710A/MG3710E/MG3740A is Off during the adjustment. Also keys other than the power key are disabled.



The power sensor may be damaged depending on the output level of the MG3710A/MG3710E/MG3740A. Beware not to apply excessive input when the terminal is connected.

Remote command	Execute the zero adjustment Command [:SOURce[1] 2]:CORRection:PMETer:ZERoset		
	Example of Use To execute the zero adjustment for the power sensor. CORR: PMET: ZER		
Setting method	 Example: To execute the zero adjustment for the power sensor 1. Connect the USB terminal of the power sensor to the USB terminal of the MG3710A/MG3710E/MG3740A. 		
	2. Connect the RF Input terminal of the power sensor to the terminal to be measured. At this time, the power sensor may be damaged depending on the output level of the MG3710A/MG3710E/MG3740A. Beware not to apply excessive input when the terminal is connected.		
	3. Enter the information of the connected power sensor with ComPort number and Model to the MG3710A/MG3710E/MG3740A.		
	4. Set the MG3710A/MG3710E/MG3740A RF Output to Off.		
	5. Press F4 Zero Sensor to execute the zero adjustment for the power sensor.		

5.5.4 Creating correction table: Create Correction File

Level or Top>Level, >>>Configure Correction>Use Power Sensor>Create Correction File This connects the PowerSensor and creates the Correction Table. The Correction Table cannot be created if it is not executed when a USB power sensor is connected. Save and recall to use the created Correction Table according to sections below: • 5.4.7 "Saving user correction table: Save" 5.4.6 "Recalling user correction table: Open" This function cannot be executed during Sweep/List. Press F6 Create Correction File in the USB Power Sensor function menu to create the correction table. The progress bar is displayed and the stop confirmation is displayed on the function menu during execution. When the stop confirmation is displayed, keys other than the function keys, power key, and cancel key are disabled. When the cancel key or power key is pressed, selection of Yes with the stop confirmation is assumed. **Remote command** Create the correction table Command Execution command [:SOURce[1]|2]:CORRection:PMETer:CREate

Processing stop command
[:SOURce[1]|2]:CORRection:PMETer:CREate:ABORt

Query

Confirms the execution status. [:SOURce[1]|2]:CORRection:PMETer:STATus?

Response

<status>

Parameter

<status></status>	CreateCorrectionTable execution status
0	Not executed
1	Being executed

Details

This function cannot be set during Sweep/List.

Example of Use

To create the correction table, confirms the execution status, and stops the execution. CORR:PMET:CRE CORR:PMET:STAT? > 1 CORR:PMET:CRE:ABOR

Setting method

Example: To create the correction table.

- 1. Connect the USB terminal of the power sensor to the USB terminal of the MG3710A/MG3710E/MG3740A.
- 2. Connect the RF Input terminal of the power sensor to the end of the path to be corrected.



The power sensor may be damaged depending on the output level of the MG3710A/MG3710E/MG3740A. Beware not to apply excessive input when the terminal is connected.

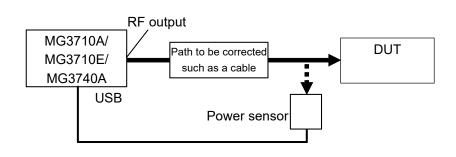


Figure 5.5.4-1 Connection

- 3. Press **F1 Connection Settings** in the USB Power Sensor function menu, and enter the information of the connected power sensor to ComPort number and Model with **F1 COM Port** and **F2 Model**.
- Press F2 Settings in the USB Power Sensor function menu to open the Settings function menu, and enter the information of the frequency range and measurement point number of the measurement target to F1 Start Freq, F2 Stop Freq, and F5 Correction Points.

- Set the path loss/gain between the MG3710A/MG3710E/MG3740A and the power sensor to F4 Level Offset Value in the Settings function menu, and set F3 Level Offset to On. Set the output level of the MG3710A/MG3710E/MG3740A to the level of the test target.
- 6. Press F6 Create Correction File in the USB Power Sensor function menu to output the CW signal from the MG3710A/MG3710E/MG3740A and sweep frequency between Start Frequency and Stop Frequency. The signal is received by the power sensor, and the difference from the MG3710A/MG3710E/MG3740A output level is created as the correction table.
- 7. Save the created Correction Table according to 5.4.7 "Saving user correction table: Save".

This chapter describes the operations and screen display of the Sweep/List function.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

6.1	Sweep	p/List Function	6-2
	6.1.1	Display description	6-2
6.2	Setting	g Item	6-5
	6.2.1	Setting operation item: Sweep	6-6
	6.2.2	Sweep Type	6-9
	6.2.3	Sweep Repeat	6-10
	6.2.4	Start/Stop Sweep	6-10
	6.2.5	Sweep Direction	6-11
	6.2.6	Manual mode	6-12
	6.2.7	Sweep Out	6-14
	6.2.8	Trigger Out Polarity	6-16
6.3	Sweep	> Function	6-18
	6.3.1	Configure Step Sweep	6-18
6.4	List Fu	unction: Configure List Sweep	6-29
	6.4.1	List Table setting	6-30
	6.4.2	Inserting/deleting row for List Table	6-37
	6.4.3	Selecting dwell time: Dwell Type	6-40
	6.4.4	Recalling List Table: Open	6-41
	6.4.5	Saving List Table: Save	6-43
6.5	Point ⁻	Trigger	6-46

6.1 Sweep/List Function

(Sweep/List) or Top>Sweep/List

MG3710A/MG3710E/MG3740A has the Sweep function for frequencies and levels to be changed within the specified range and the List function for frequencies and levels to be changed according to the List created with setting values in advance.

The Sweep function divides the specified range with the sweep point number set with Step Points and executes the sweep operation in a step-like form.

The List function assumes one row of the List Table as one sweep point and changes settings according to the List.

Notes:

- The Sweep function cannot be executed for SG1 and SG2 simultaneously.
- The analog modulation (AM/FM/φM) cannot be used during Sweep/List.

Pressing **Sweep/List** of the main function key or **F3 Sweep/List** in the top function menu displays the Sweep/List function menu and **Sweep/List Info** dialog box.

This chapter assumes that you press **Sweep/List** of the main function key or **F3 Sweep/List** in the top function menu, unless otherwise specified.

6.1.1 Display description

The display items of the **Sweep/List Info** dialog box differs between the Sweep function and List function.

The progress status is displayed with the progress bar at the bottom of this screen.

Sweep	Freq+Lvl		
Sweep Туре	Sweep		
Frequency Start	1.0000000000 GHz	Manual Mode	Off
Frequency Stop	1.0000000000 GHz	Sweep Direction	Up
Level Start	-144.00 dBm	Sweep Repeat	Cont
Level Stop	-144.00 dBm	Point Trigger	Start
Step Points	101	Point Trigger Source	Ext
		Step Dwell	2.000 ms



6.1 Sweep/List Function

Sweep	Freq+Lvl		
Sweep Туре	List		
		Manual Mode	Off
		Sweep Direction	Up
		Sweep Repeat	Cont
		Point Trigger	Start
Step Points	1	Point Trigger Source	Ext
Dwell Type	List		

Figure 6.1.1-2 Sweep/List Info Dialog Box (Sweep Type : "List")

type	Display	Description
Sweep /List		
	Sweep Type	Distinguishes the Sweep function (Sweep) and List function (List).
Sweep Frequency Start		Display start frequency of the Sweep function
	Frequency Stop	Display stop frequency of the Sweep function
	Level Start	Display start level of the Sweep function
	Level Stop	Display stop level of the Sweep function
	Step Points	Sweep point number on the Sweep function
List	Step Points	Number of sweep points for List function
	Dwell Types	Distinguishes the reference Sweep/List of DwellTime on the List function.
Sweep /List	Manual Mode	Distinguishes Automatic (Off) and Manual (On) for the operation to move to the next sweep point.
	Sweep Direction	Distinguishes the Up/Down of the execution order of the Sweep/List function.
	Sweep Repeat	Distinguishes the Continuous (Cont)/Once (Single) of the Sweep/List function.
	Point Trigger	Distinguishes the point trigger On/Off and Start/Point trigger.
	Point Trigger Source	Distinguishes the External (Ext)/Key (Key)/Remote command (Bus)/Timer (Timer) of point trigger source
	Current Point	Indicates the sweep point/ the number of sweep points being executed .
	Step Dwell	Indicates the output dwell time on Sweep/List function. Displayed when Dwell Type is Sweep.

Table 6.1.1-1 Sweep/List Info Display Items

The following are remote commands for items displayed in the **Sweep/List Info** dialog box.

Chapter 6 Sweep/List

Recalling sweep point being executed: Current Point

This command recalls the sweep point being executed.

Remote command	Query the current swee Query	ep point
	[:SOURce]:SWEep:CP	Oint?
	[:SOURce]:LIST:CPO	int?
	Response <point></point>	
	Parameter	
	<point></point>	Sweep point being executed
	Programming Example	9
	To recall the sweep poin SWE:CPO? > 100	nt being executed.
Recalling sweep point nur	mber: Current Point	
	The sweep point number	er is recalled.
Remote command	Recall the sweep point number Query [:SOURce]:LIST:POINts?	
	Response	
	<point></point>	
	Parameter	
	<point></point>	Sweep point number
	Programming Example	•

To recall the sweep point number. LIST: POIN? > 100

6.2 Setting Item

The Sweep/List function menu is described below.

Sweep/List function menu: Sweep/List

Page	Key No.	Menu Display	Function
1	F1	Sweep Off	Opens the Sweep Mode function menu and sets the execution of Sweep/List function. Refer to 6.2.1 "Setting operation item: Sweep".
	F2	Sweep Type <u>Sweep</u> List	Selects the Sweep function or List function. Refer to 6.2.2 "Sweep Type".
	F3	Sweep Repeat <u>Cont</u> Single	Sets the operation count for Sweep/List function to Single/Continuous. Refer to 6.2.3 "Sweep Repeat".
	F4	Start Sweep/Stop Sweep	Starts and stops the Sweep/List function. Refer to 6.2.4 "Start/Stop Sweep".
	F5	Sweep Direction <u>Up</u> Down	Sets the direction of execution order for Sweep/List function. Refer to 6.2.5 "Sweep Direction".
	F6	Configure Step Sweep	Displays the Sweep function menu and executes the Sweep function-related settings. Refer to 6.3 "Sweep Function".
	F7	Configure List Sweep	Displays the List Table function menu and executes the List function-related settings. List Table is displayed in the function display area. Refer to 6.4 "List Function: Configure Step Sweep".
	F8	Point Trigger	Displays the Point Trigger function menu and sets the trigger. Refer to 6.5 "Point Trigger".
2	F1	Manual Mode <u>Off</u> On	Sets Automatic (Off) and Manual (On) for the operation to move to the next point on Sweep function and List function. Refer to 6.2.6 "Manual mode".
	F2	Manual Point 1	Sets the sweep point manually on Sweep function and List function. Refer to 6.2.6 "Manual mode".
	F4	Sweep Out Sweep Status	Displays the Sweep Out function menu and sets the signal output from the SweepOut terminal. Refer to 6.2.7 "Sweep Out".
	F5	Trigger Out Polarity <u>Positive</u> Negative	Sets the polarity of Point Trigger Out signal. Refer to 6.2.8 "Trigger Out Polarity".

 Table 6.2-1
 Sweep/List Function Menu

6.2.1 Setting operation item: Sweep

(Sweep/List, >Sweep/List, >Sweep

Selects the items (frequency and level) to be executed with the setting parameters of the Sweep/List function.

Press **F1 Sweep** to display the Sweep Mode function menu. The parameters to execute the Sweep/List function are set from the frequency and level.

The setting status of the Sweep Mode function menu is displayed under the **F1 Sweep** in the **Sweet/List** function menu.

Example:

Freq + LvlTo execute the Sweep function or List functionfor Freq (frequency) and Lvl (level)

Page	Key No.	Menu Display	Function
1	F1	Off	Stops all execution of the Sweep function and List function for F2 Freq and F3 Level .
	F2	Freq <u>Off</u> On	Sets Stop (Off) or Execution (On) of the Sweep/List function for the frequency.
	F3	Level <u>Off</u> On	Sets Stop (Off) or Execution (On) of the Sweep/List function for the level.

Table 6.2.1-1 Sweep Mode Function Menu

Setting all Sweep/List function to Off: Off

(Sweep/List, >Sweep>Off

Sets all of the Sweep/List function to Off.

Press **F1 Off** to set the Sweep/List function for the frequency and level to Off.

 Remote command
 Set all of the Sweep/List function to Off

 Command

[:SOURce]:LIST:OFF

Programming Example

To set all of the Sweep/List function to Off. LIST:OFF

Sweep/List function for frequency: Freq

Sweep/List, >Sweep>Frequency

The Sweep/List function for frequency is set.

Press F2 Freq to set the Sweep/List function for frequency to On/Off.

On	Executes
Off	Stops (Default)

Remote command

Enables/disables the Sweep/List function for frequency Command

[:SOURce[1]|2]:FREQuency:MODE CW|FIXed|LIST

Query

[:SOURce[1]|2]:FREQuency:MODE?

Response

<mode>

CW, FIX or LIST For Freq=Off, CW

Parameter

<mode></mode>	Sweep function
CW	Does not execute the frequency sweep
FIXed	Does not execute the frequency sweep (Default)
LIST	Executes the sweep function.

Programming Example

To execute the sweep function for frequency. FREQ:MODE LIST FREQ:MODE? > LIST

Chapter 6 Sweep/List

Sweep/List function for level: Level

(Support or Top>Sweep/List, >Sweep>Level Sets the Sweep/List function for output level.

 $\label{eq:F3} Press \ \textbf{F3 Level} \ to \ set \ the \ Sweep/List \ function \ for \ output \ level \ to \ On/Off.$

On	Executes
Off	Stops (Default)

Remote command

Enables/disables the Sweep/List function for level Command

[:SOURce[1]|2]:POWer:MODE FIXed|LIST

Query

[:SOURce[1]|2]:POWer:MODE?

Response

<mode>

FIX or LIST

Parameter

<mode></mode>	Sweep function
FIXed	Fixed level (Default)
LIST	Executes the sweep function.

Programming Example

To execute the sweep function for level. POW:MODE LIST POW:MODE? > LIST

6.2.2 Sweep Type

(Sweep/ List) or Top>Sweep/List, >Sweep Type

Selects the Sweep function or List function.

Press F2 Sweep Type to select.

SweepStep Sweep function (Default)ListList Sweep function

Remote command

Select the Sweep function or List function Command

[:SOURce]:LIST:TYPE LIST|STEP

Query

[:SOURce]:LIST:TYPE?

Response

<type>

LIST or STEP

Parameter

<type></type>	Type of Sweep
STEP	Step Sweep function (Default)
LIST	List Sweep function

Programming Example

To select the List function from the Sweep function and List function. LIST:TYPE LIST LIST:TYPE? > LIST

6.2.3 Sweep Repeat

(Sweep/) or Top>Sweep/List, >Sweep Repeat

Selects the operation count for the Sweep/List function from Continuous/Single.

Press F3 Sweep Repeat to select.

Cont Single Continuous (Default) Once (Single)

Remote command Select the operation count for the Sweep/List function from Continuous/Single Command

:INITiate:CONTinuous[:ALL] <boolean>

0 or 1

Query

:INITiate:CONTinuous[:ALL]?

Response

<boolean>

Parameter

<boolean> OFF|0 ON|1 Repetition count Once (Single) Continuous (Default)

Programming Example

To set the sweep count to Continuous. INIT:CONT ON INIT:CONT? > 1

6.2.4 Start/Stop Sweep

(Sweep/ List) or Top>Sweep/List, >Start/Stop Sweep

Sets the Sweep/List function to Start/Stop every time the button is pressed.

Press F4 Start/Stop Sweep to execute.

Note:

This function is unavailable when the setting explained in 6.2.1 "Setting operation item: Sweep" is set to Off.

Remote command Execute the sweep operation

Command

:INITiate[:IMMediate][:ALL]

[:SOURce]:TSWeep

Programming Example

To execute the sweep operation. INIT TSW

6.2.5 Sweep Direction

	(Sweep/ List or Top>Swe	eep/List, >Sweep Direction	
	Sets the execution	order for Sweep/List function.	
	Press F5 Sweep Di	Press F5 Sweep Direction to set.	
	Up	From the start to the stop for Sweep function, and from the first to the end for List function (Default)	
	Down	In reverse order of Up	
Remote command	Set the execution order for Sweep/List function		
	Command		
	[:SOURce]:LIST:	DIRection UP DOWN	
	Query		
	[:SOURce]:LIST:	[:SOURce]:LIST:DIRection?	
	Response		
	<direction></direction>	UP or DOWN	
	Parameter		
	<direction></direction>	Execution order	
	UP	From the start to the stop for Sweep function, and from the first to the end for List function (Default)	
	DOWN	In reverse order of Up	
	Programming Example		
	To set the execution	To set the execution order to Up.	
	LIST:DIR UP		
	LIST:DIR?		
	> UP		

Chapter 6 Sweep/List

6.2.6 Manual mode

Sets the method to move to the next point on Sweep function and List function.

Manual Mode

Sweep/List, >>>>Manual Mode
Enables/disables the Manual Mode on Sweep function and List function.

Press **F1 Manual Mode** in the second page of the Sweep/List function menu to switch

Off	Sets the automatic movement to the next point
	(Default).
On	Sets the manual movement to the point set with
	Manual Point.

Remote command	Enables/disables the Manual Mode		
	Command		
	[:SOURce]:LIST:MODE AUTO MANual		

Query
[:SOURce]:LIST:MODE?

Response

<mode> A

AUTO or MAN

Parameter

<mode> Operation mode AUTO Auto (Default) MANual Manual

Programming Example

To set the point movement to Manual. LIST:MODE MAN LIST:MODE? > MAN

Manual Point

(Sweep/ List) or Top>Sweep/List, >→>Manual Point

Sets the sweep point manually on Sweep function and List function.

Press **F2 Manual Point** in the second page of the Sweep/List function menu to display the **Manual Point** dialog box in the active function frame. Set the Manual Point.

Range	On the Sweep function:
	1 to the Step Point of $SG1/2$
	On the List function:
	1 to the Step Point of $SG1/2$
Default	1



Figure 6.2.6-1 Manual Point Dialog Box

Remote command

Set the sweep point

Command

[:SOURce]:LIST:MANual <ext_integer>

Query

[:SOURce]:LIST:MANual?

Response

<ext integer>

Parameter

<ext_integer></ext_integer>	Sweep point number
Range	Refer to the above description.
Default	Refer to the above description.

Programming Example

To set the sweep points to 100. LIST:MAN 100 LIST:MAN? > 100

6.2.7 Sweep Out

^{(Sweep/}List, >→>Sweep Out

Sets the signal (information) output from the SweepOut terminal.

To use this function, the general purpose input/output option is required. This function is unavailable when Sweep/List Type is set to Sweep for SG2.

Press **F4 Sweep Out** in the second page of the Sweep/List function menu to display the Sweep Out function menu for selection.

10 V Sweep Signal Sweep Status Outputs the sweep position with 0 to 10 V. Outputs the identifying signal for sweeping and non-sweeping (Default).

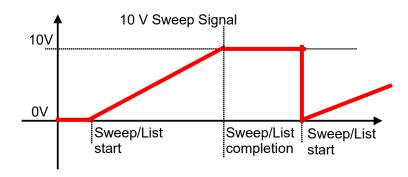


Figure 6.2.7-1 10 V Sweep Signal

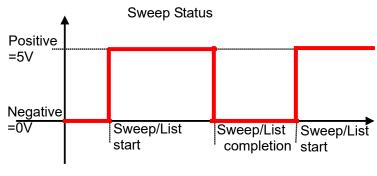


Figure 6.2.7-2 Sweep Status

Remote command

Select the SweepOut terminal output format Command

:ROUTe[:CONNectors]:OUTPut:SOUT SWEep|SETTled

Query

:ROUTe[:CONNectors]:OUTPut:SOUT?

Response

<mode>

SWE or SETT

Parameter

<mode></mode>	Output signal
SWEep	10 V Sweep Signal
SETTled	Sweep Status (Default)

Details

To use this function, the general purpose input/output option 017/117 is required.

This function is unavailable when Sweep/List Type is set to Sweep for SG2.

Programming Example

To set the output signal to Sweep Status. ROUT:OUTP:SOUT SETT ROUT:OUTP:SOUT? > SETT

6.2.8 Trigger Out Polarity

(Sweep/List, >→>Trigger Out Polarity

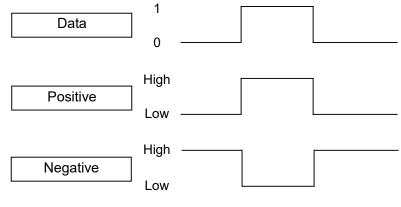
Sets the polarity of Point Trigger Out signal.

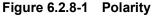
Note:

For the output connector setting, refer to 7.4.2 "Route Output Connectors".

Press **F5 Trigger Out Polarity** in the second page of the Sweep/List function menu to set the polarity of Point Trigger Out signal.

Positive Negative Positive polarity (Default) Negative polarity





Remote command Set the polarity of Point Trigger Out signal Command

:TRIGger:OUTPut:POLarity POSitive | NEGative

Query

:TRIGger:OUTPut:POLarity?

Response

<polarity>

POS or NEG

Parameter

<polarity> Sig
POSitive Pos
NEGative Neg

Signal polarity Positive polarity (Default) Negative polarity

Programming Example

To set the signal polarity to negative. TRIG:OUTP:POL NEG TRIG:OUTP:POL? > NEG

6.3 Sweep Function

6.3.1 Configure Step Sweep

(Sweep/ List) or Top>Sweep/List, >Configure Step Sweep

Execute the settings to execute the Sweep function.

Press **F6 Configure Step Sweep** in the Sweep/List function menu to display the Sweep function menu.

Page	Key No.	Menu Display	Function
1	F1	Freq Start	Sets the start frequency of the Sweep function.
		$1.00000000000~{ m GHz}$	
	F2	Freq Stop	Sets the stop frequency of the Sweep function.
		$1.00000000000 \mathrm{GHz}$	
	F3	Level Start	Sets the start level of the Sweep function.
		–144.00 dBm	
	F4	Level Stop	Sets the stop level of the Sweep function.
		–144.00 dBm	
	F5	Points	Sets the point number on the Sweep function.
		101	
	F6	Dwell Time	Sets the dwell time at each point on the Sweep
		2.000 ms	function execution.
	F8	Step Shape	Selects the normal sweep or triangle sweep on
		<u>SawTooth</u> Triangle	the Sweep function.

Table 6.3.1-1 Sweep Function Menu

Sweep start frequency: Freq Start

(Support or Top>Sweep/List, >Configure Step Sweep>Freq Start Sets the start frequency of the Sweep function.

Press **F1 Freq Start** to display the **Freq Start** dialog box in the active function frame. Set the start frequency.

Range	Same as the frequency setting range of	
	MG3710A/MG3710E/MG3740A	
Resolution	0.01 Hz	
Default	1 GHz	



Figure 6.3.1-1 Freq Start Dialog Box

Remote command	Set the start frequency of the Sweep function Command [:SOURce[1] 2]:FREQuency:STARt <freq></freq>	
	Query [:SOURce[1] 2]:FREQuency:STARt?	
	Response	
	<freq></freq>	Unit: Hz
	Parameter	
	<freq></freq>	Start frequency
	Range	Depends on the frequency setting range of MG3710A/MG3710E/MG3740A.
	Resolution	0.01 Hz
	Default	1 GHz
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
		When omitted Hz
	Programming Exampl To set the start frequent FREQ:STAR 800MHZ	

FREQ:STAR?
> 800000000.00

Sweep stop frequency: Freq Stop

Sets the stop frequency of the Sweep function.

Press **F2 Freq Stop** to display the **Freq Stop** dialog box in the active function frame. Set the stop frequency.

Same as the frequency setting range of	
MG3710A/MG3710E/MG3740A.	
0.01 Hz	
1 GHz	



Figure 6.3.1-2 Freq Stop Dialog Box

Remote command Set the sweep stop frequency of the Sweep function

Command

[:SOURce[1]|2]:FREQuency:STOP <freq>

Query

[:SOURce[1]|2]:FREQuency:STOP?

Response

<freq>

Parameter

<freq></freq>	Stop frequency	
Range	Depends on the frequency setting range of	
	MG3710A/MG3710E/MG3740A.	
Resolution	0.01 Hz	
Default	1 GHz	
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ	
	When omitted Hz	

Programming Example

To set the frequency to 1,800 MHz. FREQ:STOP 1800MHZ FREQ:STOP? > 180000000.00

	Using this command the start and stop fre	he sweep center frequency of the Sweep function. with the command to set the span frequency sets equencies as a result. ly with remote commands.
Remote command	Set the sweep center frequency of the Sweep function	
	Command	
	[:SOURce[1] 2]:F	REQuency:CENTer <freq></freq>
	Query [:SOURce[1] 2]:FREQuency:CENTer? [MAXimum MINimum] Response	
	<freq></freq>	
	MAXimum	Maximum settable frequency of
		MG3710A/MG3710E/MG3740A
	MINimum	Minimum settable frequency of
		MG3710A/MG3710E/MG3740A (9 kHz)
	Omitted	Center frequency
	Parameter	
	<freq></freq>	Sweep center frequency
	Range Depends on the frequency	Depends on the frequency setting range of
		MG3710A/MG3710E/MG3740A.
	Resolution	0.01 Hz
	Default	1 GHz
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
		When omitted Hz

Programming Example

To set the center frequency to 800 MHz. FREQ:CENT 800MHZ FREQ:CENT? > 800000000.00

Related command

This command sets the sweep span frequency of the Sweep function. Using this command with the command to set the center frequency sets the start and stop frequencies as a result.

This is a function only with remote commands.

Remote command	Set the sweep span frequency of the Sweep function		
	Command		
	[:SOURce[1][2]:1	FREQuency:SPAN <freq></freq>	
	Query		
	[:SOURce[1] 2]:FREQuency:SPAN? [MAXimum MINimum]		
	Response		
	<freq></freq>		
	MAXimum	Maximum settable frequency span	
		(Maximum settable frequency of	
		MG3710A/MG3710E/MG3740A – 9 kHz)	
	MINimum	Minimum settable frequency (0 Hz)	
	Omitted	Sweep span frequency	
	Parameter		
	<freq></freq>	Sweep span frequency	
	Range	Depends on the frequency setting range of	
		MG3710A/MG3710E/MG3740A.	
	Resolution	0.01 Hz	
	Default	1 GHz	
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ	
		When omitted Hz	
	Programming Example		
	To set the span frequency to 800 MHz.		
	FREQ:SPAN 800MH	Z	
	FREQ:SPAN?		
	> 80000000.00		

Sweep start level: Level Start

Sets the start output level of the Sweep function.

Press **F3 Level Start** to display the **Level Start** dialog box in the active function frame. Set the start output level.

Range	Same as the output level setting range of
	MG3710A/MG3710E/MG3740A.
Resolution	0.01 dB
Default	Same as the output level initial value of
	MG3710A/MG3710E/MG3740A.



Figure 6.3.1-3 Level Start Dialog Box

Remote command	Set the start output level of the Sweep function	
	Command	
	[:SOURce[1] 2]:POWer:STARt <ampl></ampl>	
	Query	

[:SOURce[1]|2]:POWer:STARt?

Response

<ampl>

Unit: dBm

Parameter

<ampl></ampl>	Start output level
Range	Same as the output level setting range of
	MG3710A/MG3710E/MG3740A
Resolution	0.01 dB
Default	Same as the output level initial value of
	MG3710A/MG3710E/MG3740A

Programming Example

To set the sweep start output level to -30.00 dBm. POW:STAR -30.00 POW:STAR? > -30.00

Sweep stop level: Level Stop

or Top>Sweep/List, >Configure Step Sweep>Level Stop Sets the stop output level of the Sweep function.

Press **F4 Level Stop** to display the **Level Stop** dialog box in the active function frame. Set the stop output level.

Range	Same as the output level setting range of
	MG3710A/MG3710E/MG3740A
Resolution	0.01 dB
Default	Same as the output level initial value of
	MG3710A/MG3710E/MG3740A



Figure 6.3.1-4 Level Stop Dialog Box

Remote command	Set the stop output level of the Sweep function Command [:SOURce[1] 2]:POWer:STOP <ampl> Query [:SOURce[1] 2]:POWer:STOP? Response</ampl>			
	<ampl></ampl>	Unit: dBm		
	Parameter			
	<ampl></ampl>	Stop output level		
	Range	Same as the output level setting range of MG3710A/MG3710E/MG3740A		
	Resolution	0.01 dB		
	Default	Same as the output level initial value of MG3710A/MG3710E/MG3740A		
	Programming Example			
	To set the sweep stop output level to -50.00 dBm. POW:STOP -50.00 POW:STOP?			

> -50.00

Sweep points: Points

Sweep/ or Top>Sweep/List, >Configure Step Sweep>Points

Sets the point number on the Sweep function.

Press **F5 Points** to display the **Points** dialog box in the active function frame. Set the point number.

linimum value	2	
laximum value	1000	Normal sweep
	500	Triangle sweep
01		
1	aximum value	



Figure 6.3.1-5 Points Dialog Box

Remote command	Command	nber on the Sweep funct :SWEep:POINts <val< th=""><th></th><th></th></val<>				
	Query [:SOURce[1] 2]:SWEep:POINts?					
	Response <value></value>					
	Parameter					
	<value></value>	Point number				
	Range	Minimum value	2			
		Maximum value	1000	Normal sweep		
			500	Triangle sweep		
	Resolution	1				
	Default	101				
	Programming Exa	ample				
To set the point		umber to 300.				

To set the point number to 300. SWE:POIN 300 SWE:POIN? > 300

Dwell Time

(Sweep/List, >Configure Step Sweep>Dwell Time

Sets the dwell time at each point on the Sweep function execution.

Press **F6 Dwell Time** to display the **Dwell Time** dialog box in the active function frame. Set the dwell time.

Range	100 μs to 16 s
Resolution	$1 \ \mu s$
Default	2 ms



Figure 6.3.1-6 Dwell Time Dialog Box

Remote commandSet the dwell time at each point on the Sweep function execution
Command

[:SOURce[1]|2]:SWEep:DWELl <time>

Query

[:SOURce[1]|2]:SWEep:DWELL?

Response

<time>

Unit: s

Parameter

<time></time>	Dwell time
Range	100 μs to 16 s
Resolution	1 µs
Default	2 ms
Suffix code	S, MS, US, NS, PS
	When omitted S

Programming Example

To set the dwell time to 200 µs. SWE:DWEL 200US SWE:DWEL? > 0.000200

Step Shape

(Sweep/) or Top>Sweep/List, >Configure Step Sweep>Step Shape

Selects the sweep shape from normal sweep or triangle sweep on the Sweep function.

Press F8 Step Shape to switch the normal sweep/triangle sweep.

Saw Tooth	Norr
Triangle	Tria

Normal sweep (Default) Triangle sweep

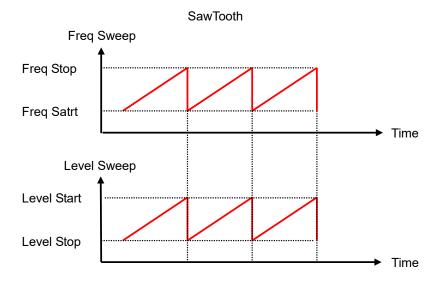


Figure 6.3.1-7 Saw Tooth (Normal) Sweep

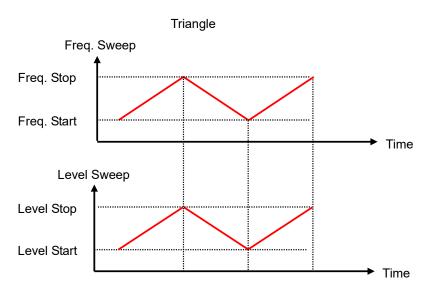


Figure 6.3.1-8 Triangle Sweep

Remote command

Select the sweep shape on the Sweep function Command

[:SOURce[1]|2]:SWEep:SHAPe <shape>

Query

[:SOURce[1]|2]:SWEep:SHAPe?

Response

<shape>

Parameter

<shape></shape>	
SAWTooth	
TRIangle	

Sweep shape Normal sweep (Default) Triangle sweep

Programming Example

To set the sweep shape to the triangle sweep. SWE:SHAP TRI SWE:SHAP? > TRI

6.4 List Function: Configure List Sweep

(Sweep/List, >Configure List Sweep

Configures the settings to execute the List function.

Press **F7 Configure List Sweep** in the Sweep/List function menu to display the List Table function menu and List Table.

Page	Key No.	Menu Display	Function	
1	F1	The function displayed on F1 depends on the cursor position on List Table.		
		Edit Item	Displayed when the cursor is on Frequency, Level or Dwell on List Table. The input dialog box for the selected item is displayed in the active function frame. Enter the appropriate number.	
			Refer to 6.4.1 "List Table setting".	
		SG SG1 SG2	Displayed when the cursor is on SG of the List Table. Select SG to be applied.	
		<u>SG1</u> SG2	Refer to 6.4.1 "List Table setting".	
	F2	Insert Row	Inserts a row to the list. The row is added above the row where the cursor is positioned.	
			Refer to 6.4.2 "Inserting/deleting row for List Table".	
	F3	Delete Row	Deletes the row where the cursor is positioned in the list. Refer to 6.4.2 "Inserting/deleting row for List Table".	
	F4	Clear	Deletes all of the list and initializes it.	
	F6	Dwell Type <u>Sweep</u> List	Refer to 6.4.2 "Inserting/deleting row for List Table". Selects the application origin for DwellTime on the List function. Refer to 6.4.3 "Selecting dwell time: Dwell Type".	
	F7	Open	Displays the Recall List Table function menu and recalls the List Table data.	
			Refer to 6.4.4 "Recalling List Table: Open".	
	F8	Save	Displays the Save List Table function menu and saves the List Table.	
			Refer to 6.4.5 "Saving List Table: Save".	

Table 6.4-1 List Table Function Menu

6.4.1 List Table setting

(Sweep/ List or Top>Sweep/List, >Configure List Sweep

F1 key in the function menu depends on the item selected with the cursor on List Table.

Move the cursor with the rotary knob or step key to set items.

/I SG:	_	710A	Vector Signal Generator 1.000	000 000 00 GH:	z –144	. 00 dBm O		List Table
SG Fre	1 equer	ncy	ARB SWEEP			Amplitude		Edit Item
			1.000 (000 000 ()0 _{GHz}	-144.00	dBm	Insert Row
								Delete Row
	Ĺ	_ist Ta	ıble				L	Clear
		SG	Frequency	Level			Dwell	
I-		SG1	1.0000000000 GHz	-30.00 dBm			1 ms	
-		SG1 SG1	1.1000000000 GHz 1.2000000000 GHz	-27.00 dBm -24.00 dBm			2 ms 3 ms	
<u> </u>		SG1	1.3000000000 GHz	-24.00 dBm			4 ms	
	İ	Uul	1.500000000000000				1 110	Dwell Type
								Sweep <u>List</u>
								Open
								Open
								<u> </u>
								Save
								Jave
()					2011/	12/21 21:14:51	

Figure 6.4.1-1 List Table

SG setting: SG				
	(Sweep/ List) or Top>Sweep/List, >Configure List Sweep>SG			
	When the cursor is on " \mathbf{SG} ", F1 key is "SG". Press F1 SG to select SG to			
	apply List Table.			
	SG1 Targets SG1. (Default)			
	SG2	Targets SG2.		
Remote command	Command	<pre>specifying the list number :SOURce:SPECify <integer>,1 2</integer></pre>		
	Query			
	[:SOURce]:LIST	:SOURce:SPECify? <integer></integer>		
	Response			
	<sg></sg>	1 or 2		

Parameter	
<integer></integer>	List number
Range	1 to 500
Resolution	1
Default	1
<sg></sg>	SG number
1	SG1 (Default)
2	SG2

Programming Example

To set SG2 to the list number 20. LIST:SOUR:SPEC 20,2 LIST:SOUR:SPEC? 20 > 2

Setting frequency: Edit Item

(Sweep/List, >Configure List Sweep>Edit Item

When the cursor is on "Frequency", **F1** key is "Edit Item". Press **F1 Edit Item** to display the **Frequency** dialog box in the active function frame. Set the frequency.

Range	Same as the frequency setting range of
	MG3710A/MG3710E/MG3740A
Resolution	0.01 Hz
Default	1 GHz

_		SG1 ency			1.100 00	00 000 00 _{GHz}
					Increment	100.000 00 kHz
-		• • T				
		List Ta	1 DIE			
		LIST TA	Frequency	Level		Dwell
	1		1	Level -30.00 dBm		Dwell 1 ms
•	1	SG	Frequency			
▶	1 2	SG SG1	Frequency 1.0000000000 GHz	-30.00 dBm		1 ms

Figure 6.4.1-2 Frequency Dialog Box

Remote command

Set the frequency specifying the list number

Command

[:SOURce]:LIST:FREQuency:SPECify <integer>,<freq>

Query

[:SOURce]:LIST:FREQuency:SPECify? <integer>

Response	
<freq></freq>	Unit: Hz
Devenueden	
Parameter	
<integer></integer>	List number
Range	1 to 500
Resolution	1
Default	1
<freq></freq>	Frequency
Range	Depends on the frequency setting range of
	MG3710A/MG3710E/MG3740A.
Resolution	0.01 Hz
Default	1 GHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	When omitted Hz

Programming Example

To set 800 MHz to the list number 1. LIST:FREQ:SPEC 1,800MHZ LIST:FREQ:SPEC? 1 > 80000000.00

Setting Level: Edit Item

(Sweep/) or Top>Sweep/List, >Configure List Sweep>Edit Item

When the cursor is on "Level", F1 key is "Edit Item". Press F1 Edit Itemto display the Level dialog box in the active function frame. Set the level.RangeSame as the output level setting range of
MG3710A/MG3710E/MG3740AResolution0.01 dBDefaultSame as the output level initial value of

Same as the output level initial value of MG3710A/MG3710E/MG3740A



Figure 6.4.1-3 Level Dialog Box

Remote command

Set the level specifying the list number Command

[:SOURce]:LIST:POWer:SPECify <integer>,<ampl>

Query

[:SOURce]:LIST:POWer:SPECify? <integer>

Response

<ampl>

Unit: dBm

Parameter

<integer></integer>	List number
Range	1 to 500
Resolution	1
Default	1
<ampl></ampl>	Output level
Range	Output level setting range of
	MG3710A/MG3710E/MG3740A
Resolution	0.01 dB
Default	Minimum output level of
	MG3710A/MG3710E/MG3740A
Suffix code	DBM, DM, DBUV, DBUVE
	DBM when omitted

Programming Example

To set -30.00 dBm to the list number 1. LIST:POW:SPEC 1,-30.00 LIST:POW:SPEC? 1 > -30.00

Setting dwell time: Edit Item

(Sweep/List, >Configure List Sweep>Edit Item

When the cursor is on "**Dwell**", **F1** key is "Edit Item". Press **F1 Edit Item** to display the **Dwell** dialog box in the active function frame. Set the Dwell Time.

Range Resolution Default

100 μs to 16 s 1 μs (990 ns) 2 ms

	: vell	SG1				2.000 ms
					Increment	2.000 ms
		List Ta	able			
		List Ta	Frequency	Level		Dwell
••••••	1		1	Level -30.00 dBm		Dwell 1 ms
•	1	SG	Frequency			
•	1 2	SG SG1	Frequency 1.0000000000 GHz	-30.00 dBm		1 ms

Figure 6.4.1-4 Dwell Dialog Box

Remote command Set the dwell time specifying the list number Command

[:SOURce]:LIST:DWELl:SPECify <integer>,<time>

Query

[:SOURce]:LIST:DWELL:SPECify? <integer>

Response

<time>

Unit: s

Parameter	
<integer></integer>	List number
Range	1 to 500
Resolution	1
Default	1
<time></time>	Dwell time
Range	100 µs to 16 s
Resolution	1 μs (990 ns)
Default	2 ms
Suffix code	S, MS, US, NS, PS
	S when omitted

Programming Example

To set 200 µs to the list number 1. LIST:DWEL:SPEC 1,200US LIST:DWEL:SPEC? 1 > 0.000200

Operation description

Operation of Dwell Time

Dwell Time operation differs between SG with one list and SG with two lists.

1. For SG with one list

The signal of each element has the dwell time specified with Dwell Time.

No.	Type of SG	Frequency	Dwell Time
1	SG1	F1	1 ms
2	SG1	F2	2 ms
3	SG1	F3	3 ms
4	SG1	F4	4 ms
5	SG1	F5	5 ms



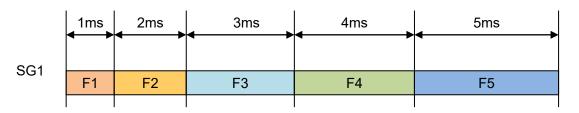


Figure 6.4.1-5 Dwell Time Operation (1SG)

2. For SG with two lists

It is same as the SG with one list that the signal output of the next Element is started after Dwell Time; however, the other SG which is not the target SG for the next Element keeps unchanged status (the signal output is not stopped).

No.	Type of SG	Frequency	Dwell Time
1	SG1	F1	1 ms
2	SG2	F2	2 ms
3	SG1	F3	3 ms
4	SG1	F4	4 ms
5	SG2	F5	$5~{ m ms}$

Table 6.4.1-2 Setting Example of Dwell Time

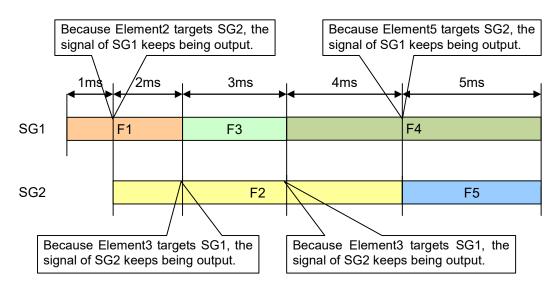


Figure 6.4.1-6 Dwell Time Operation (2SG)

6.4.2 Inserting/deleting row for List Table

Insertion/deletion of input row for List Table is executed.

Inserting row to List Table: Insert Row

Sweep/ List or Top>Sweep/List, >Configure List Sweep>Insert Row

Press **F2 Insert Row** to add a row beneath the row where the cursor is positioned and existed rows are replaced down by one row. The added row is a copy of the specified row.

List Table can have up to 500 rows.

		SG	Frequency	Level	Dwell
-	1	SG1	1.00000000000 GHz	-30.00 dBm	1 ms
	2		1.10000000000 GHz	-27.00 dBm	2 ms
		SG1	1.20000000000 GHz	-24.00 dBm	3 ms
		SG1	1.3000000000 GHz	-21.00 dBm	4 ms
1	L	_ist Ta	ıble		
	L	_ist Ta	ble		
	L	_ist Ta SG	ble Frequency	Level	Dwell
	L 1			Level	Dwell 1 ms
	1	SG	Frequency		
	1 2	SG SG1	Frequency 1.0000000000 GHz	-30.00 dBm	1 ms
	1 2 3	SG SG1 SG1	Frequency 1.0000000000 GHz 1.1000000000 GHz	-30.00 dBm -27.00 dBm	1 ms 2 ms

Figure 6.4.2-1 Insert Row

 Remote command
 Add a new row above the specified row

 (The added row will be a copy of the specified row)

 Command

 [:SOURce]:LIST:TYPE:LIST:INSert [<integer>]

Parameter

<integer></integer>	Position for the row to be inserted
Range	1 to the sweep point number
	The last row when omitted
Resolution	1
Default	1

Programming Example

To add a new row above the $10^{\rm th}$ row. LIST:TYPE:LIST:INS 10

Deleting row from List Table: Delete Row

(Sweep/List, >Configure List Sweep>Delete Row

Press F3 Delete Row to delete the row where the cursor is positioned and existed rows are replaced up by one row.

		SG	Frequency	Level	Dwell
	1	SG1	1.0000000000 GHz	-30.00 dBm	1 ms
•	2	SG1	1.1000000000 GHz	-27.00 dBm	2 ms
	3	SG1	1.2000000000 GHz	-24.00 dBm	3 ms
	- 4	SG1	1.3000000000 GHz	-21.00 dBm	4 ms
	l	List Ta	able		
	l	List Ta	able	•	
	l	List Ta SG	ble Frequency	Level	Dwell
	1		1	Level	Dwell 1 ms
Þ	1	SG	Frequency		

Figure 6.4.2-2 Delete Row

L

Remote command

Delete the specified row (When there is only one row, the row is changed to the initial value) Command

[:SOURce]:LIST:TYPE:LIST:DELete [<integer>]

Parameter

<integer></integer>	Position of the row to be deleted
Range	1 to the sweep point number
	The last row when omitted
Resolution	1
Default	1

Programming Example

To delete the 10th row. LIST:TYPE:LIST:DEL 10

Clearing List Table: Clear

(Sweep/) or Top>Sweep/List, >Configure List Sweep>Clear

6.4 List Function: Configure List Sweep

		SG	Frequency	Level	Dwell
	1	SG1	1.0000000000 GHz	-30.00 dBm	1 ms
•	2	SG1	1.1000000000 GHz	-27.00 dBm	2 ms
	3	SG1	1.20000000000 GHz	-24.00 dBm	3 ms
		SG1	1.3000000000 GHz	-21.00 dBm	4 ms
		List Ta			
				Level	Dwell

Figure 6.4.2-3 Clear

Remote command

Delete all rows of List Table

Command

[:SOURce]:LIST:TYPE:LIST:INITialize:PRESet

Programming Example

To delete all rows of List Table. LIST:TYPE:LIST:INIT:PRES

6.4.3 Selecting dwell time: Dwell Type

Superior Top>Sweep/List, >Configure List Sweep>Dwell Type Selects the Dwell Time used on the List function.

Press **F6 Dwell Type** to switch List/Sweep.

List Sweep Applies the Dwell Time in List. (Default) Applies the Dwell Time set with the Sweep function menu.

Remote command	ote command
----------------	-------------

Select the dwell time applied on the List function Command

[:SOURce]:LIST:DWEL1:TYPE LIST|STEP

Query

[:SOURce]:LIST:DWEL1:TYPE?

Response <type>

LIST or STEP

Parameter

<type></type>	Dwell time to be applied
LIST	Dwell Time in List (Default)
STEP	Dwell Time set with the Sweep function menu

Programming Example

To apply the Dwell Time in List. LIST:DWEL:TYPE LIST LIST:DWEL:TYPE? > LIST

6.4.4 Recalling List Table: Open

or Top>Sweep/List, >Configure List Sweep>Open Recalls the saved List Table file.

Remote command	Recall the saved List Table file Command	
	:MMEMory:LOAD:LIST <string>[,<device>]</device></string>	

Parameter

<string></string>	File name without an extension	
	Character string within 100 characters enclosed	
	by double quotes (" ") or single quotes (' ')	
	(excluding extension)	
<device></device>	Drive number	
Options	A to Z, currently selected drive when omitted	

Programming Example

To recall the List file with the file name of "ABC" from the D drive. MMEM:LOAD:LIST "ABC", D

 Setting method
 Example: To recall the List Table file.

 1.
 Press F7 Open in the List Table function menu to display the List

 Table Recall dialog box in the active function frame, File List dialog box in the function display frame, and List Table Recall function menu in the function menu frame.

Table 6.4.4-1 List Table	e Recall Function Me	enu
--------------------------	----------------------	-----

Pag e	Key No.	Menu Display	Function
1	F1	Drive C:	Opens the Device function menu for selection of Device where List Table to be recalled is saved.
	F7	Open	Recalls the List Table file in Device selected with F1 Drive .
	F8	Cancel	Returns to the previous menu.

2. Press **F1 Drive** to select Device containing the List Table file to be recalled.

Options All connected Drives Default C

3. The **File List** dialog box of the device selected in Step 2 is displayed, and the csv files are displayed.

List Table Recall	
File List	
Path : C:\Anritsu\MG3710A\User Data\ListTable\	
Name	
List20111214_000	
_ist20111214_001	
_ist20111214_002	
List20111214_003	
_ist20111214_004	
_ist20111214_005	
_ist20111214_006	
_ist20111214_007	
List20111214_008	
List20111214_009	
List20111214_010	
List20111214_011	
List20111214_012	
List20111214_013	
List20111214_014 List20111214_015	

Figure 6.4.4-1 List Table Recall Screen

- 4. Select the List Table file to be recalled.
- 5. Press **F7 Open** to recall the selected List Table file.

Notes:

- File names are listed in alphanumeric order.
- If no List Table file exists, "File not found" is displayed.

Saving List Table: Save 6.4.5

(Sweep/) or Top>Sweep/List, >Configure List Sweep>Save Saves the List Table with set parameters in the internal hard disk.

Remote command	Save the List Table with set parameters	
	Command	
	:MMEMory:STORe:LIST [<string>[,<device>]]</device></string>	

Parameter

<string></string>	File name without an extension Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ') (excluding extension)
	The following characters cannot be used: $(/ : * ?) / < > $
	Automatically named as "List[Date]_[Additional number].csv" when omitted.
	The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
<device> Options</device>	Drive number A to Z, currently selected drive when omitted

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\ListTable\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To save the LIST file with the file name of "ABC" to the D drive. MMEM:STOR:LIST "ABC",D

Setting methodExample: To save the currently displayed List Table with the file name
of "ABC".1. Press F8 Save in the List Table function menu to display the List

Press F8 Save in the List Table function menu to display the List Table Save dialog box in the active function frame, File List dialog box in the function display frame, and List Table Save function menu in the function menu frame.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Device function menu and sets the destination Drive.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	$\mathbf{F7}$	Save	Saves the file to the Device selected with F1 Drive .
	F8	Cancel	Returns to the previous menu.

 Table 6.4.5-1
 List Table Save Function Menu

2. Press **F1 Drive** to select the destination Device.

Options All connected Drives

Default C

3. The **File List** dialog box of the device selected in Step 2 is displayed, and the csv files are displayed.

List Table Save	ABCDEFGHIJKLMNOPQRSTUVWXYZ@	
	<pre>A BC DEFG H I JK L M NOPQ RST UVWXYZ ,</pre>	
File List		
Path : C:\Anritsu\MG3710	A\User Data\ListTable\	
Name		
_astParameterSetting_listT _ist20111214_000 _ist20111214_001	able	
_ist20111214_002 _ist20111214_003		
.ist20111214_004 .ist20111214_005 .ist20111214_006		
ist20111214_007 ist20111214_008		
.ist20111214_009 .ist20111214_010 .ist20111214_011		
.ist20111214_012 .ist20111214_013		
_ist20111214_014 _ist20111214_015		

Figure 6.4.5-1 List Table Save Screen

 Enter the file name to the text box in the active function frame. By default, the "ListDate_Additional number" is displayed in the text box. 5. Enter "ABC" in the text box and press **F7 Save**. The List Table file with the entered file name is saved, and the **List Table Save** dialog box closes. Press **F8 Cancel** to return to the previous screen without saving the List Table file.

Notes:

•

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
 - Destination path: Anritsu\MG3710A\User Data\ListTable\
- Default destination name: List[date]_[additional number].csv The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
- Characters available for file names are displayed on the character palette.
- The following characters cannot be used:
 / : * ? " " ' < > |
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

6.5 Point Trigger

(Sweep/List, >Point Trigger

Sets the point trigger to move to the next point on Sweep/List function.

Note:

The Point Trigger uses the trigger signal input as Pattern Trigger1. For the input connector setting, refer to Section 7.4.1 "Route Input Connectors".

Press **F8 Point Trigger** in the Sweep/List function menu to display the Point Trigger function menu.

Page	Key No.	Menu Display	Function
1	F1	Point Trigger	Enables/disables the trigger on Sweep/List function.
		<u>Off</u> On	
	F2	Mode	Selects the trigger mode on Sweep/List function.
		<u>Start</u> Point	
F3 Source		Source	Displays the Point Trigger Source function menu
		Ext	and sets the trigger source on Sweep/List function.
	F4 Delay Sets t		Sets the delay time from Point Trigger input to
		0.00000000 s	hardware settings on Sweep/List function.
<u>Rise</u> Fall Poin		Edge	Sets the polarity to be triggered for External
		<u>Rise</u> Fall	PointTriggerSource.
		Timer Period	Sets the timer trigger period.
		1.000 ms	
	F8	Trigger Key	Executes Point Trigger if the key is pressed when
	inggor hoy		Source is Trigger Key.

 Table 6.5-1
 Point Trigger Function Menu

Point Trigger

(Sweep/List, >Point Trigger>Point Trigger

Enables/disables the trigger on Sweep/List function. Press **F1 Point Trigger** to switch the trigger On/Off.

OffDoes not use the trigger (Default).OnUses the trigger.When Manual Mode is On, Manual has priority and Trigger is ignored.

Remote command

Enables/disables the trigger

Command

[:SOURce]:LIST:TRIGger[:STATe] <boolean>

Query

[:SOURce]:LIST:TRIGger[:STATe]?

Response

<boolean>

0 or 1

Parameter

<boolean></boolean>	Trigger setting
OFF 0	Does not use the trigger (Default).
ON 1	Uses the trigger.

Details

When Manual Mode is On, Manual has priority and Trigger is disabled.

Programming Example

To set the trigger to On. LIST:TRIG ON LIST:TRIG? > 1

Trigger mode: Mode					
	Sweep/ List or Top>Sweep/List, >Point Trigger>Mode				
	The trigger mode on Sweep/List function is selected.				
	Press F2 Mode to switch Start/Point trigger.				
	Start	Start trigger (Default)			
	Point	Point trigger			
Remote command	Set the trigger mode				
	Command				
	[:SOURce]:LIST:TRIGger:MODE STARt POIN				
	[:SOURce]:LIST:TRIGger:MODE?				
	Response				
	<mode></mode>	STAR or POIN			
	Parameter				
	<mode></mode>	Trigger setting			
	STARt	Start trigger (Default)			
	POINts	Point trigger			
	Programming Example				
	To set the trigger mode to Start trigger. LIST:TRIG:MODE STAR LIST:TRIG:MODE?				
	> STAR				
Operation description	Start trigger and Point trigger				
	A	Start Trigger			

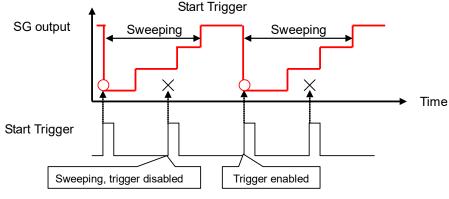


Figure 6.5-1 Start Trigger



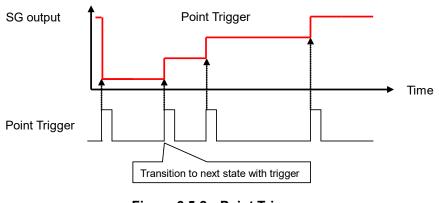


Figure 6.5-2 Point Trigger

Trigger source: Source	Sets the trigger source Press F3 Source to dis	List, >Point Trigger>Source on Sweep/List function. splay the Point Trigger function menu and select	
	the trigger source.		
	Ext	External input (PatternTrigger1) (Default)	
	Key	Trigger key F8 Trigger Key	
	Bus	Remote command	
	Timer	Trigger with the internal timer	
Remote command	Set the trigger source		
	Command		
	[:SOURce]:LIST:TR	IGger:SOURce BUS EXTernal KEY TIMer	
	Query		
	[:SOURce]:LIST:TR	IGger:SOURce?	
	Response		
	<source/>	BUS, EXT, KEY or TIM	
	Parameter		
	<source/>	Trigger source	
	BUS	Remote command	
	EXTernal	External input (PatternTrigger1) (Default)	
	KEY	Trigger key F8 Trigger Key	
	TIMer	Trigger with the internal timer	

	Programming Exam To set the trigger sou LIST:TRIG:SOUR T LIST:TRIG:SOUR? > TIM	arce to the internal timer.
Trigger delay: Delay	Sets the delay time from Point Trigger>Delay Sets the delay time from Point Trigger input to hardware settings on Sweep/List function. Press F4 Delay to display the Delay dialog box in the active function frame. Set the delay time.	
	Range	0 s to 2.5 s
	Resolution	10 ns
	Default	0 s
Remote command	Command [:SOURce]:LIST:T Query [:SOURce]:LIST:T	rom the Point Trigger input PRIGger:DELay <time> PRIGger:DELay?</time>
	Response	TT
	<time></time>	Unit: s
	Parameter	
	<time></time>	Delay time
	Range	0 s to 2.5 s
	Resolution	10 ns
	Default	0 s
	Suffix code	S, MS, US, NS, PS
		S when omitted
	<pre>Programming Example To set the delay time from the Point Trigger input to 200 μs. LIST:TRIG:DEL 200US LIST:TRIG:DEL? > 0.00020000</pre>	

Trigger edge: Edge	(Sweep/List, >Point Trigger>Edge Sets the polarity to be triggered for External PointTriggerSource. Press F5 Edge to switch Rise/Fall.		
	Rise	Rise (Default)	
	Fall	Fall	
Remote command	Set the trigger polarity Command :TRIGger[:SEQuence]:SLOPe POSitive NEGative	
	Query		
	:TRIGger[:SEQuence]:SLOPe?	
	Response		
	<edge></edge>	POS or NEG	
	Parameter		
	<edge></edge>	Trigger polarity	
	POSitive	Rise (Default)	
	NEGative	Fall	
	Programming Example		
	To set the trigger polarity to fall.		
	TRIG:SLOP NEG TRIG:SLOP?		

> NEG

Chapter 6 Sweep/List

Timer Period

Sweep/ or Top>Sweep/List, >Point Trigger>Timer Period

Sets the timer trigger period.

Press **F6 Timer Period** to display the **Timer Period** dialog box in the active function frame. Set the period.

Range	500 μs to 4000 s
Resolution	$1 \ \mu s$
Default	1 ms

Remote command

Set the timer trigger period Command

:TRIGger[:SEQuence]:TIMer <time>

Query

:TRIGger[:SEQuence]:TIMer?

Response

<time>

Parameter

<time> Range Resolution Default Suffix code

Timer trigger period 500 µs to 4000 s 1 µs 1 ms S, MS, US, NS, PS S when omitted

Programming Example

To set the timer trigger period to 10 ms. TRIG:TIM 10MS TRIG:TIM? > 0.010000

Trigger Key

Sweep/ or Top>Sweep/List, >Point Trigger>Trigger Key

Generates the trigger manually.

When the trigger source is set to Trigger Key, press **F8 Trigger Key** to allow manual generation of the trigger.

This chapter describes the operations and input/output signal settings related to the modulation function of MG3710A/MG3710E/MG3740A.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

7.1	Setting	Digital Modulation Analysis	7-2
	7.1.1	Display description	7-4
7.2	Analog	Modulation: Analog/Pulse	7-12
	7.2.1	AM modulation: AM	7-14
	7.2.2	FM/ _{\$\$} M	7-30
	7.2.3	Pulse	7-54
	7.2.4	Optimize Function for the Analog Modulation	n:
		Optimize	7-69
7.3	Baseba	and Mode	7-71
	7.3.1	ARB	7-74
	7.3.2	Pattern generation mode: Combination	
		Mode	7-80
	7.3.3	ARB Setup	7-95
	7.3.4	Loading waveform pattern: Load	.7-107
	7.3.5	Selecting output waveform pattern: Select	.7-120
	7.3.6	Copying external waveform pattern: Copy	.7-130
	7.3.7	RF Gate	.7-137
	7.3.8	Start/Frame Trigger	.7-146
	7.3.9	Setting Frame trigger operation: Event	.7-156
	7.3.10	Frame Count	.7-159
	7.3.11	Baseband Clock	.7-162
	7.3.12	Marker Setup	.7-168
	7.3.13	Sequence Mode	.7-176
	7.3.14	Pattern Trigger	.7-182
	7.3.15	Sync Multi SG	.7-190
7.4	Route	Connectors	.7-203
	7.4.1	Route Input Connectors	.7-204
	7.4.2	Route Output Connectors	.7-214
7.5	AWGN		.7-228
7.6	I/Q Mo	dulation	.7-236
	7.6.1	I/Q Calibration	.7-244
	7.6.2	Analog I/Q Input Adjustments	.7-248
	7.6.3	Analog I/Q Output Adjustments	.7-251
	7.6.4	Internal Baseband Adjustments	.7-259

7.1 Setting Digital Modulation Analysis

Mode or Top>Mode

Press **Mode** of the main function key or **F4 Mode** on the top function menu to activate the digital modulation setting mode and the ARB/Waveform function menu is displayed.

In MG3740A, Mode can be set only when option 020/120 is installed.

This section assumes that you press **Mode** and the digital modulation setting mode has been activated, unless otherwise specified.

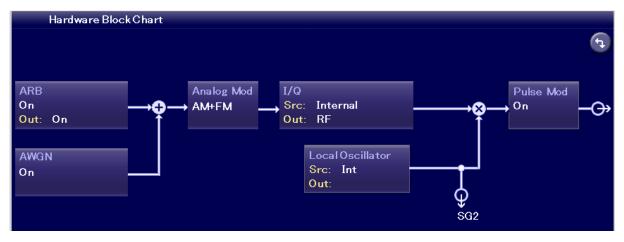


Figure 7.1-1 Outline of MG3710A/MG3710E/MG3740A modulation circuit

Settings of ARB of the digital modulation setting mode and AWGN, Analog/Pulse, I/Q, Modulation, and SG Output on the Top function menu switch the flow of modulated signals and decide the type of signals output from the RF and I/Q output.

The digital modulation states of RF and I/Q output corresponding to each setting are described on the next page.

7.1 Setting Digital Modulation Analysis

Settings			Output Signal	
I/Q Src	I/Q Out	Modulation	I/Q Out	RF Output
Internal,	\mathbf{RF}	Off	No output	CW
Analog I/Q In				
Analog I/Q In		On		External vector modulation
Internal				Internal vector modulation
Internal,	Analog I/Q	Off	No output	CW
Analog I/Q In	Out			
Analog I/Q In		On	Internal I/Q signal	External vector modulation*
Internal				CW*

 Table 7.1-1
 Digital modulation Setup State and Signal Output

* If I/Q Out is set to **Analog I/Q Out** and Modulation is **On**, the RF output level is not guaranteed.

7.1.1 Display description

This section describes the Hardware Block Chart. For the ARB Info display description, refer to 7.3.1 "ARB".

Press the Top menu to display the Hardware Block Chart and each of SG1 and SG2 has the independent display screen.

Press each displayed block to display the function menu and dialog box necessary for setting.

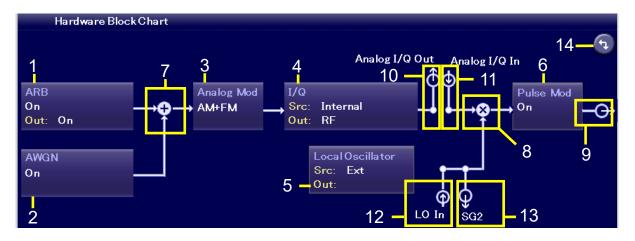


Figure 7.1.1-1 Hardware Block Chart

Note:

The figure above is for explanation; it is different from the actual display.

7.1 Setting Digital Modulation Analysis

No	Display Example	Display	Description
		ARB	ARB block
1	ARB On Out: On	On/Off	Indicates On/Off of ARB (function to generate modulated signals with arbitrary waveform patterns).
		Out:	Indicates On/Off of the arbitrary waveform pattern output.
0	AWGN	AWGN	AWGN block
2	On	On/Off	Indicates On/Off of AWGN addition.
	Analog Mod	Analog Mod	Analog Modulation block
3	AM+FM	AM/FM/øM	Indicates the analog modulation (AM/FM/ ϕ M) during modulation.
		I/Q	I/Q block
4	I/Q Src: Internal Out: RF	Src:Internal/ Analog I/Q In	Indicates the I/Q signal source.
	out. Iti	Out: RF/ Analog I/Q Out	Indicates the output destination for baseband signals.
		Local Oscillator	Local Oscillator block
5	Local Oscillator Src: Ext	Src: Int/Ext/Sync	Indicates the Local signal source.
	Out:	Out:/On/Off	Indicates On/Off of the Local signal external output.
_	Pulse Mod	Pulse Mod	Pulse Modulation block
6	On	On/Off	Indicates On/Off of Pulse modulation.
7	→↔		Indicates that inputs from two function blocks of the left side and bottom side are combined and output to the function block of the right side.
8	→ œ़		Indicates that the input Local signal from the bottom side is modulated with the input signal from the left side and output to the function block of the right side.
9	– O		Indicates the RF Output is On.
10	Ĉ.	Analog I/Q Out	Indicates the Analog I/Q signal is set to the external output.

Table 7.1.1-1 Hardware Block Chart Display Details

	Table 7.1.1-1 Hardware Block Chart Display Details (Cont d)				
No	Display Example	Display	Description		
11	⊕	Analog I/Q In	Indicates the Analog I/Q signal is set to the external input.		
10	Ť	LO In (For SG1)	Indicates the SG1 Local signal source is set to Ext (input from the rear LO Input connector).		
12	φ	SG1 (For SG2)	Indicates the SG2 Local signal source is set to Sync and the signal is input from SG1.		
13	Ĩ	SG2 (For SG1)	Indicates the SG1 Local signal external output setting is On and the signal is output to SG2. If SG2 is not installed, "LO Out" (output from the rear LO Output connector) is displayed.		
	Φ	LO Out (For SG2)	Indicates the Local signal external output setting (output from the rear LO Output connector) is On.		
			Click to switch Hardware Block Chart and ARB Info display.		
14	(5)		The switching button appears only in the MG3740A with option-020/120 installed.		
			Refer to 7.3.1 "ARB".		

ont'd)
l

Remote command

Query the pattern playback status

Query

[:SOURce[1]|2]:RADio:ARB:REGister[:STATus]?

Response

<status>

Parameter

<status></status>	Playback status	
Value	= bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 +	
	bit7	
$bit2:2^{2}=4$	Playing	
bit0, 1, 3 to 15	Not used	
Range	0 to 255	
Default	0 (Paused)	

Details

"Paused" is returned while waiting for trigger.

Programming Example

To query the playback status of SG1 output pattern. RAD:ARB:REG? > 4

Resident display frame ARB

Information of the waveform pattern selected with ARB function is displayed in the resident display frame in the lower function display frame. In MG3740A, resident display frame ARB is available only when option-020/120 is installed.

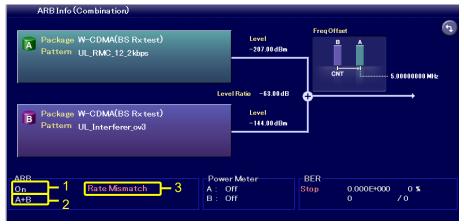


Figure 7.1.1-2 Resident Display Frame ARB

No	Function	Display Example	Description
1	ARB status	On	Indicates On/Off of the ARB function.
			On : ARB On
			Off: ARB Off
2	Output waveform	A+B	Indicates the status of output waveform. CW: CW
	status		A : Outputs the waveform pattern of Memory A.
			B: Outputs the waveform pattern of Memory B.
			A+B : Outputs the waveform patterns of Memory A and Memory B.
			A+AWGN : Outputs the waveform pattern of Memory A and AWGN.
			B+AWGN : Outputs the waveform pattern of Memory B and AWGN.
			Multiplex : Outputs the Multiplex waveform.
			Long : Outputs the Long waveform.
			Seq.(A) : Outputs the Sequence waveform (Only Memory A is used).
			Seq.(A+B) : Outputs the Sequence waveform (Add Pattern is added).
			Seq.(A+AWGN) : Outputs the Sequence waveform (AWGN is added).

Table 7.1.1-2 Resident Display Frame ARB

7.1 Setting Digital Modulation Analysis

No	Function	Display Example	Description
3	Rate Mismatch display	Rate Mismatch	Displays the Rate Mismatch information. This is displayed when the rate matching is unavailable due to internal operation clock limitation of the MG3710A/MG3710E/MG3740A.
			Refer to Figure 7.3.2-6 "Rate Matching Function".
4	FIR Error display	FIR Error	Displays the FIR Error information. This is displayed for the condition of no correct signal output when the waveform is to be output which uses the internal FIR filter of the MG3710A/MG3710E/MG3740A.

Table 7.1.1-2 Resident Display Frame ARB (Cont'd)

Note:

For Add Pattern, refer to 4.8.2 "Combination File Edit screen" in MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).

Rate Mismatch The Rate Mismatch message is displayed only when "Mismatch" of Rate Matching has occurred in the ARB field of the resident display frame. Remote command Query the status of Rate Matching Query [:SOURce[1] | 2]:RADio:ARB:RMATching:ERRor? Response <status> Parameter <status> Status of Rate Matching NORM Normal A mismatch of sampling rates does not occur. MISS Mismatch A mismatch of sampling rates occurs. The sampling rate of Pattern B was changed to that of Pattern A.

Programming Example

To query the Rate Matching status of SG1. RAD:ARB:RMAT:ERR? > NORM

FIR Error

The FIR Error message is displayed for the condition of no correct signal output when the waveform is to be output which uses the internal FIR filter of the MG3710A/MG3710E/MG3740A.

With the Internal FIR function, the signal to which the FIR filter is applied can be output within the MG3710A/MG3710E/MG3740A under the following conditions.

Combination file
Waveform of Data Width of 1, 2, or 4 with the use of Internal FIR at
Memory A side
Waveform of Data Width of 16 with the use of Internal FIR at Memory B side

- Pattern file Waveform of Data Width of 1, 2, or 4 with the use of Internal FIR at Memory A side No output at Memory B side

If the waveform with the use of Internal FIR is output under the conditions other than the above, FIR Error is displayed and no correct signal is output.

7.2 Analog Modulation: Analog/Pulse

Top>→>Analog/Pulse

Executes the analog modulation (AM/FM/ ϕ M) for modulated signals created by CW signal or ARB. In addition, when additional analog modulation input option

(MG3710A/MG3710E/MG3740A-050/080/150/180) is installed, the analog modulation can be executed with the external input signal. For usage with low output frequency, the impact of second harmonic

wave cut filter may degrade characteristics of high-frequency wave side.

Pulse modulation is executed with arbitrary frequency and timing settings. Modulation by external input signals is also supported. The RF Gate function which runs in tandem with the waveform pattern and the pulse modulation can be applied simultaneously, and the pulse modulation is executed because of OR.

Notes:

- If the output modulated wave exceeds the modulation bandwidth of the MG3710A/MG3710E/MG3740A, a missing signal/alias may occur. When AM modulation, FM modulation, or ϕ M modulation is executed, be careful that the bandwidth used does not to exceed the modulation bandwidth.
- The analog modulation (AM/FM/ ϕ M) cannot be used during Sweep/List.
- When additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed, using the analog modulation input may cause analog modulation input overflow.

Press **F3 Analog/Pulse** on page 2 of the top function key to open the **Analog Modulation Info** dialog box and the Analog Pulse function menu.

Analog Modulation Info						
State	Depth/Deviation	Source	Rate	Waveform	Width	Delay
Off	0.1 %	Int	400.0 Hz	Sine		
Off	0.1 %	Int	400.0 Hz	Sine		
Off	1.0000 kHz	Int	400.0 Hz	Sine		
Off	1.0000 kHz	Int	400.0 Hz	Sine		
Off	0.000 rad	Int	400.0 Hz	Sine		
Off	0.000 rad	Int	400.0 Hz	Sine		
Off		Freerun	400.0 Hz		2.00	0.00000000 s
Off		Freerun	400.0 Hz		2.00	0.00000000 s
	State Off Off Off Off Off Off Off	State Depth/Deviation Off 0.1 % Off 0.1 % Off 1.0000 kHz Off 0.000 rad Off 0.000 rad Off 0.000 rad Off 0.000 rad	State Depth/Deviation Source Off 0.1 % Int Off 0.1 % Int Off 1.000 kHz Int Off 1.0000 kHz Int Off 0.000 rad Int Off 0.000 rad Int Off 0.000 rad Int Off 0.000 rad Int	State Depth/Deviation Source Rate Off 0.1 % Int 400.0 Hz Off 0.1 % Int 400.0 Hz Off 0.000 kHz Int 400.0 Hz Off 1.0000 kHz Int 400.0 Hz Off 0.000 rad Int 400.0 Hz Off Freerun 400.0 Hz	State Depth/Deviation Source Rate Waveform Off 0.1 % Int 400.0 Hz Sine Off 0.1 % Int 400.0 Hz Sine Off 0.1 % Int 400.0 Hz Sine Off 0.000 kHz Int 400.0 Hz Sine Off 1.0000 kHz Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off Freerun 400.0 Hz Sine	State Depth/Deviation Source Rate Waveform Width Off 0.1 % Int 400.0 Hz Sine Off 0.1 % Int 400.0 Hz Sine Off 0.1 % Int 400.0 Hz Sine Off 1.0000 kHz Int 400.0 Hz Sine Off 1.0000 kHz Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine Off 0.000 rad Int 400.0 Hz Sine 2.00

Figure 7.2-1 Analog Modulation Info

Page	Key No.	Menu Display	Function
1	F1	AM	Displays the AM function menu to set the settings related to AM (amplitude) modulation. Refer to 7.2.1 "AM Modulation: AM".
	F2	FM/φM	Displays the FM/ ϕ M function menu to set the settings related to FM (frequency) modulation/ ϕ M (phase) modulation. Refer to 7.2.2 "FM/ ϕ M".
	F3	Pulse	Displays the Pulse function menu to set the settings related to Pulse modulation. Refer to 7.2.3 "Pulse".
	F8	Optimize <u>Spurious</u> Distortion	Selects Spurious Mode or Distortion Mode to optimize analog modulation. Refer to 7.2.4 "Optimize Function for the Analog Modulation: Optimize".

Table 7.2-1 Analog Pulse Function Menu

7.2.1 AM modulation: AM

or Top>→>Analog/Pulse>AM

Sets the settings related to AM (amplitude) modulation.

Press **AM** on the main function menu or **F1 AM** on the Analog Pulse function menu to open the AM function menu.

Note:

Settings related to the AM modulation are disabled when Sweep/List is being executed.

Out Of Range status may be displayed while the AM modulation is applied. This indicates the status where the output level has been adjusted automatically not to exceed the output upper level of the MG3710A/MG3710E/MG3740A.

In this case, the operations below allows avoiding the Out Of Range.

- Disable the AM modulation.
- Lower the AM modulation depth.
- Lower the Level.

Table 7.2.1-1 AM Function Menu

Page	Key No.	Menu Display	Function
1	$\mathbf{F1}$	AM1 Setup	Sets the AM1.
	F2	AM2 Setup	Sets the AM2. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press **AM1 Setup (AM2 Setup)** on the AM function menu to open the AM1 setup (AM2 setup) function menu.

Example: To execute the AM modulation.

- 1. Set the AM modulation to On with **F1 AM**.
- 2. Select the AM modulation application type with **F2 AM Depth Type**.
- 3. Set the AM modulation depth with F3 AM Depth (Lin) or F4 AM Depth (Log).
- 4. Set the modulation frequency with **F5 AM Rate**.
- 5. Press **RF Output On/Off** to light the LED to set the RF output to On.
- 6. Press Mod On/Off to light the LED to start the AM modulation.

7.2 Analog Modulation: Analog/Pulse

Page	Key No.	Menu Display	Function
1	F1	AM <u>Off</u> On	Enables/disables the AM (amplitude) modulation.
	F2	AM Depth Type <u>Lin</u> Exp	Selects the AM modulation application type.
	F3	AM Depth (Lin) 0.1 %	Sets the AM modulation depth with the linear value.
	F4	AM Depth (Log) 3.00 dB	Sets the AM modulation depth with the Log value.
	F5	AM Rate 400.0 Hz	Sets the AM modulation frequency.
	F6	Setup AM Source	Sets the AM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.
	F7	Phase Adjust 0.0 deg	Adjusts the phase of internal AM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Table 7.2.1-2 AM Function Menu

AM Modulation On/Off: AM

		nalog/Pulse>AM>AM1 Setup (AM2 Setup), AM amplitude) modulation.
	Press F1 AM on the AM on/off.	11 Setup (AM2 Setup) Function Menu to turn
	Off	Disables AM Modulation (Default).
	On	Enables AM Modulation.
Remote command	To enable/disable AM Command	
	[:SOURce[1] 2]:AM	[1] 2:STATe <boolean></boolean>
	Query	
	[:SOURce[1] 2]:AM	[1] 2:STATe?
	Response	
	<boolean></boolean>	0 or 1
	Parameter	
	<boolean></boolean>	AM Modulation On/Off
	OFF 0	Disables AM Modulation (Default).
	ON 1	Enables AM Modulation.
	Programming Example	e

To set the AM Modulation to On. AM:STAT ON AM:STAT? > 1

AM Depth Type: AM Depth Type

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup),

AM Depth Type

Selects the AM modulation application type.

Note:

AM Depth Type is a shared parameter for the AM1 and the AM2. The same value is set.

Press **F2 AM Depth Type** on the AM1 Setup (AM2 Setup) function menu for selection.

Lin Linear format (Default) Exp Exponential format

Remote command

Select the AM modulation application type Command

[:SOURce[1]|2]:AM:TYPE LINear|EXPonential

Query

[:SOURce[1]|2]:AM:TYPE?

Response

<type>

LIN or EXP

Parameter

<type> LINear EXPonential Type Linear format (Default) Exponential format

Programming Example

To set the AM modulation application type to the linear format. AM:TYPE LIN AM:TYPE? > LIN

AM Depth (Lin)

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup), AM Depth (Lin)

Sets the AM modulation depth with the linear value.

Press **F3 AM Depth (Lin)** on the AM1 Setup (AM2 Setup) function menu to set with the **AM Depth (Lin)** dialog box. This can be selected when **Lin** is selected at AM Depth Type.

Range	0% to $100%$
Resolution	0.1%
Default	0.1%

When the AM modulation is executed for the CW signal with the amplitude A, the signal below is created.

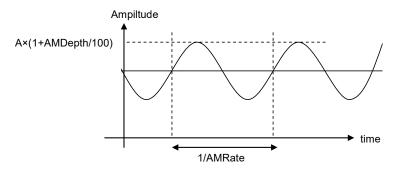


Figure 7.2.1-1 AM Modulation (Lin)

Remote command	Set the AM modulation depth with the linear value	
	Command	
	[:SOURce[1] 2]:AM[1] 2[:DEPTh][:LINear] <percent></percent>	

Query

[:SOURce[1]|2]:AM[1]|2[:DEPTh][:LINear]?

Response

<percent>

Unit: %

Parameter

<percent></percent>	Linear value for AM modulation depth
Range	0% to 100%
Resolution	0.1%
Default	0.1%
Unit	%
Suffix code	PCT (%), When omitted: PCT

Details

This can be set when a linear waveform is set at AM Depth Type.

Programming Example

To set the AM modulation depth to 5% with the linear value. AM 5 AM? > 5.0

AM Depth (Log)

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup), AM Depth (Log)

Sets the AM modulation depth with the Log value.

This cannot be set when the external modulation signal is selected (Ext is selected in the AM source).

Press **F4 AM Depth (Log)** on the AM1 Setup (AM2 Setup) function menu to set with the **AM Depth (Log)** dialog box. This can be selected when **Exp** is selected at AM Depth Type.

Range	0 dB to 10 dB $$
Resolution	0.01 dB
Default	3 dB

When the AM modulation is executed for the CW signal with the amplitude A, the signal below is created.

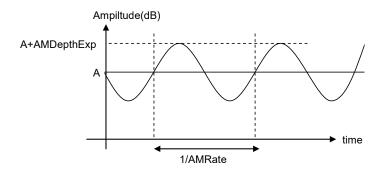


Figure 7.2.1-2 AM Modulation (Log)

Remote command	Command	ion depth with the Log value
	Query [:SOURce[1] 2]:	AM[1] 2[:DEPTh]:EXPonential?
	Response <rel_ampl></rel_ampl>	Unit: dB
	Parameter	
	<rel_ampl></rel_ampl>	Log value for AM modulation depth
	Setting	0 to 10 dB
	Resolution	0.01 dB
	Default	3 dB
	Suffix code	DB, When omitted: DB

Details

This can be set when an exponential function waveform is set at AM Depth Type.

Programming Example

To set the AM modulation depth to 5 dB with the Log value. AM:EXP 5 AM:EXP? > 5.00

AM Rate

Remote

	AM or Top>→>A AM Rate	Analog/Pulse>AM>AM1 Setup (AM2 Setup),	
	Sets the AM modulat	ion frequency.	
	Press F5 AM Rate on with the AM Rate dia	the AM1 Setup (AM2 Setup) function menu to set log box.	
	This cannot be set wh is selected in the AM	nen the external modulation signal is selected (Ext source).	
	Range	0.1 Hz to 50 MHz	
	Resolution	0.1 Hz	
	Default	400 Hz	
e command	Query [:SOURce[1] 2]:AN	on frequency 4[1] 2:INTernal:FREQuency <freq> 4[1] 2:INTernal:FREQuency?</freq>	
	Response		
	<freq></freq>	Unit: Hz	
	Parameter		
	<freq></freq>	AM modulation frequency	
	Range	$0.1 \mathrm{~Hz}$ to $50 \mathrm{~MHz}$	
	Resolution	0.1 Hz	
	Default	400 Hz	
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ	

When omitted: HZ

Programming Example

To set the AM modulation frequency to 500 Hz. AM:INT:FREQ 500 AM:INT:FREQ? > 500.0

Setup AM Source

Image: Analog/Pulse>AM>AM1 Setup (AM2 Setup),

Setup AM Source

Sets the AM modulation signals.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

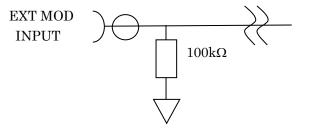
Press **F6 Setup AM Source** on the AM1 Setup (AM2 Setup) function menu to open the Setup AM Source function menu.

Page	Key No.	Menu Display	Function
1	F1	AM Source <u>Int</u> Ext	Switches the internal modulation signal/external modulation signal.
	F2	Waveform Sine	Selects the waveform of the internal modulation signal. This can be select when Int is selected in the AM source.
	F6	Coupling <u>DC</u> AC	Sets the DC coupling or AC coupling for the external modulation signal.
	F7	Impedance 600 Ω	Sets the termination for the external modulation signal.
	F8	Ext DC Cal	Adjusts the DC offset for the external modulation signal.

Table 7.2.1-3 Setup AM Source Function Menu

Note:

Because the external modulation signal has terminating resistance, some voltage may be generated even if the coupling is set to AC.



Switching AM Source: AM Source

	Setup AM Source, AM		
	Switches the AM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.		
	Press F1 AM Source on the Setup AM Source function menu for selection.		
	Int Ext	Internal modulation signal (Default) External modulation signal	
Remote command	Switch the AM modulation signal Command [:SOURce[1] 2]:AM[1] 2:SOURce INT INT1 INT2 EXT		
	Query [:SOURce[1] 2]:AM[1] 2:SOURce?		
	Response		
	<type></type>	INT or EXT	
	Parameter		
	<type></type>	Туре	
	INT	Internal modulation signal (Default)	
	INT1	Internal modulation signal (Processed as INT)	
	INT2	Internal modulation signal (Processed as INT)	
	EXT	External modulation signal	
	Programming Exampl	e	
	To switch the AM mod	ulation signal to the external modulation signal.	
	AM:SOUR EXT		

AM:SOUR EX

> EXT

AM Waveform: Waveform

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup)> Setup AM Source, Waveform

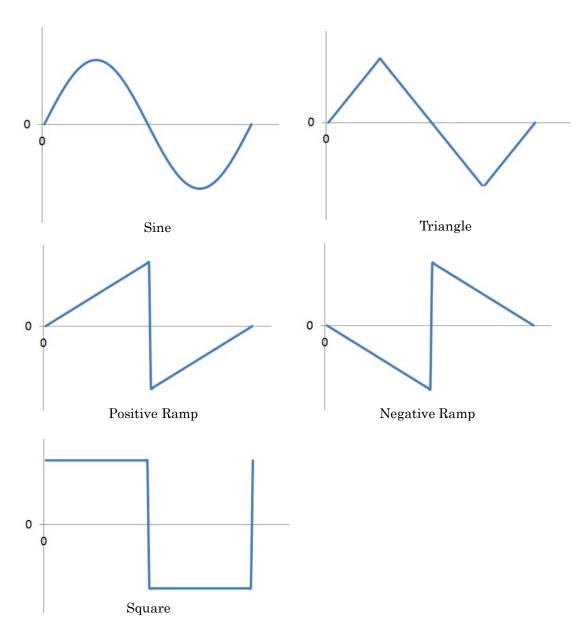
Selects the waveform of the internal modulation signal.

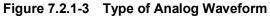
This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

 Press F2 Waveform on the Setup AM Source function menu for selection.

This can be set when **Int** is selected in the AM source.

Options Sine (Sine wave) Triangle (Triangular waveform) Square (Square wave) Positive Ramp (Ramp wave (positive)) Negative Ramp (Ramp wave (negative)) Default Sine Figure 7.2.1-3 shows the types of selectable waveforms.





Remote command S

Select the waveform of the internal AM modulation signal Command

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion[1]|2:SHAPe SINE|TRIangle|SQUare|RAMP

Query

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion[1]|2:SHAPe?

Response

<type>

SINE, TRI, SQU, RAMP

Parameter	
<type></type>	waveform
SINE	Sine (Default)
TRIangle	Triangle
SQUare	Square
RAMP	Ramp

Programming Example

To set the waveform of the internal AM modulation signal to the Triangle. AM:INT:FUNC:SHAP TRI AM:INT:FUNC:SHAP? > TRI

Remote command

Select the shape of the ramp wave

Command

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion:SHAPe:RAMP
POSitive|NEGative

Query

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion:SHAPe:RAMP?

Response

<type>

POS,NEG

Parameter

<type> POSitive NEGative waveform Positive Ramp (Default) Negative Ramp

Programming Example

To set the shape of the ramp wave to the negative ramp. AM:INT:FUNC:SHAP RAMP AM:INT:FUNC:SHAP:RAMP NEG AM:INT:FUNC:SHAP:RAMP? > NEG

Coupling: Coupling			
	or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup)> Setup AM Source, Coupling		
	Sets the DC coupling or AC coupling for the external modulation signal.		
	This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.		
	Press F6 Coupling on the Setup AM Source function menu for selection.		
	DC AC	DC coupling (Default) AC coupling	
Remote command	Remote command Set the DC coupling or AC coupling for the external mo Command		
	[:SOURce[1] 2]:EXTMod:COUPling DC AC		
	Query		
	[:SOURce[1] 2]:EXTMod:COUPling?		
	Response		
	<type></type>	DC,AC	
	Parameter		
	<type></type>	Coupling	
	DC	DC coupling (Default)	
	AC	AC coupling	
	Programming Example		
	To set the DC coupling for the external modulation signal.		
	EXTM:COUP DC		
	EXTM:COUP?		
	> DC		

Impedance: Impedance

Analog/Pulse>AM>AM1 Setup (AM2 Setup)> or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup)> Setup AM Source, Impedance

Sets the termination for the external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press **F7 Impedance** on the Setup AM Source function menu for selection.

$50 \ \Omega$	$50 \ \Omega$ termination
600 Ω	600 Ω termination (Default)
Hi-Z	High impedance (100 k Ω /70 pF)

Remote command Set the termination for the external modulation signal Command

[:SOURce[1]|2]:EXTMod:IMPedance 50|600|HIZ

Query

[:SOURce[1]|2]:EXTMod:IMPedance?

Response

<type>

50,600,HIZ

Parameter

<type></type>	Termination
50	$50 \ \Omega$ termination
600	$600 \ \Omega$ termination (Default)
HIZ	High impedance (100 kΩ/70 pF)

Programming Example

To set the 50 Ω termination for the external modulation signal. EXTM: IMP 50 EXTM: IMP? > 50

Ext DC Cal: Ext DC Cal

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup)> Setup AM Source, Ext DC Cal

Adjusts the DC offset for external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

This can be used when in the modulation output status (setting either AM, FM, ϕ M, or Pulse modulations to On, and Mod to On).

When one of the following conditions is met, press **F8 Ext DC Cal** on the Setup AM Source function menu to adjust the DC offset.

- AM = On and AM Source = Ext in AM1 Setup
- AM = On and AM Source = Ext in AM2 Setup
- FM = On and FM Source = Ext in FM1 Setup
- FM = On and FM Source = Ext in FM2 Setup
- $\bullet \ \phi M$ = On and ϕM Source = Ext in $\phi M1$ Setup
- ϕM = On and ϕM Source = Ext in $\phi M2$ Setup

Remote command Adjust the DC offset for external modulation signal Command

:CALibration:EXTernal[1]|2:DC

Parameter

None

Details

As for node :EXTernal[1] | 2, select the external modulation signal for SG1 or the external modulation signal for SG2. Set as follows:

External modulation signal for SG1: :EXTernal1 or EXTernal External modulation signal for SG2: :EXTernal2

Programming Example

To Adjust the DC offset for external modulation signal. CAL:EXT:DC

AM Phase Adjust: Phase Adjust

or Top>→>Analog/Pulse>AM>AM1 Setup (AM2 Setup),

Phase Adjust

Adjusts a phase of internal AM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press **F7 Phase Adjust** on the AM1 Setup (AM2 Setup) function menu to set with the **Phase Adjust** dialog box.

Range	$-180 \deg$ to $+180 \deg$
Resolution	0.1 deg
Default	0 deg

Remote command

Adjust the phase of internal AM modulation signal Command

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion[1]|2:POFFset
<phase>

Query

[:SOURce[1]|2]:AM[1]|2:INTernal:FUNCtion[1]|2:POFFset?

Response

<phase>

Unit: deg

Parameter

<phase></phase>
Range
Resolution
Default
Suffix code

Phase of internal AM modulation signal -180 deg to +180 deg 0.1 deg 0 deg DEG, When omitted: DEG

Programming Example

To set the phase of internal AM modulation signal to 10 deg. AM:INT:FUNC:POFF 10 AM:INT:FUNC:POFF? > 10.0

7.2.2 FM/_φM

\mathbb{F}_{M}^{M} or Top> \rightarrow >Analog/Pulse>FM/ ϕ M

Sets the settings related to FM (frequency) modulation or ϕM (phase) modulation.

Press $FM/\phi M$ on the main function menu or $F2 FM/\phi M$ on the Analog Mod function menu to open the $FM/\phi M$ function menu.

Notes:

- The FM modulation and ϕM modulation cannot be set to on simultaneously.
- Settings related to FM modulation and φM modulation are disabled when Sweep/List is being executed.

Page	Key No.	Menu Display	Function
1	F1	FM/øM1 Setup	Sets the FM/ ϕ M1.
	F2	FM/øM2 Setup	Sets the FM/φM2. This is available only when additional analog modulation input option (MG3710A/MG3710E /MG3740A-050/080/150/180) is installed.

Table 7.2.2-1 FM/₀M Function Menu

Press **FM/\phiM1 Setup (FM/\phiM2 Setup)** on the AM function menu to open the FM/ ϕ M1 (FM/ ϕ M2) function menu.

Example: To execute the FM modulation.

<Procedure>

- 1. Set the FM modulation to On with **F1 FM**.
- 2. Set the FM frequency deviation with **F2 FM Deviation**.
- 3. Set the FM modulation frequency with F3 AM Rate.
- 4. Press **RF Output On/Off** to light the LED to set the RF output to On.
- 5. Press **Mod On/Off** to light the LED to start the FM modulation.

Example: To execute the ϕM modulation.

<Procedure>

- 1. Selects Page 2 of M/ ϕ M1 (FM/ ϕ M2) Setup Function Menu.
- 2. Set the ϕ M modulation to On with **F1** ϕ M.
- 3. Set the ϕ M deviation angle with **F2** ϕ M Deviation.
- 4. Set the ϕ M modulation frequency with **F3** ϕ M Rate.
- 5. Press **RF Output On/Off** to light the LED to set the RF output to On.
- 6. Press **Mod On/Off** to light the LED to start the ϕ M modulation.

Page	Key No.	Menu Display	Function
1	F1	FM <u>Off</u> On	Enables/disables the FM (Frequency Modulation).
	F2	FM Deviation 1.0000 kHz	Sets the FM frequency deviation.
	F3	FM Rate 400.0 Hz	Sets the FM modulation frequency.
	F4	Setup FM Source	Sets the FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.
	F5	Phase Adjust 0.0 deg	Adjusts the phase of internal FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.
2	F1	φM <u>Off</u> On	Sets the ϕM (phase modulation) On/Off.
	F2	φM Deviation 1.0000 rad	Sets the ϕM deviation angle.
	F3	φM Rate 400.0 Hz	Sets the ϕM modulation frequency.
	F4	Setup øM Source	Sets the φM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.
	F5	Phase Adjust 0.0 deg	Adjusts the phase of internal FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Table 7.2.2-2 FM/ ϕ M1 Setup / FM/ ϕ M2 Setup Function Menu

FM modulation On/Off: FM

	(FM/ _φ M2 Setup), FM	nalog/Pulse>FM/φM>FM/φM1 Setup M (frequency) modulation.	
	Press F1 FM on the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set On/Off.		
	Off On	Disables FM Modulation (Default). Enables FM Modulation.	
	The FM modulation ca modulation.	nnot be set to On at the same time with the ϕM	
Remote command	Enable/disable the FM modulation Command [:SOURce[1] 2]:FM[1] 2:STATe <boolean></boolean>		
	Query [:SOURce[1] 2]:FM[1] 2:STATe?		
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	FM Modulation On/Off	
	OFF 0	Disables FM Modulation (Default).	
	ON 1	Enables FM Modulation.	
	Programming Example)	
	To set the FM modulat	ion to On.	
	FM:STAT ON		
	FM:STAT?		
	> 1		

FM Deviation

Թ∭) or Top>→>Analog/Pulse>FM/_φM>FM/_φM1 Setup

(FM/_φM2 Setup), FM Deviation

The FM frequency deviation is set.

Press **F2 FM Deviation** on the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set with the **FM Deviation** dialog box.

Range	When FM Waveform is Sine: 0 Hz to 40 MHz*1*2,
	or 0 Hz to $(50 \text{ MHz}-\text{FM Rate})^{*3}$
	the maximum is whichever smaller.
	When FM Waveform is other than Sine:
	0 Hz to 4 MHz,
	or 0 Hz to (5 MHz–FM Rate) *4
	or 0 Hz to 40 $\mathrm{MHz^{*1*2}}$
	the maximum is the smallest of the three.

Resolution 0.1 Hz Default 1 kHz (FM/ ϕ M1) 0 Hz (FM/ ϕ M2)

- *1: FM Deviation (FM/φM2) is the frequency deviation of FM/φM2 available when MG3710A/MG3710E/MG3740A-050/150/080/180 is installed.
- *2: FM Deviation (FM/ ϕ M1) + FM Deviation (FM/ ϕ M2) \leq 40 MHz
- *3: FM Rate + FM Deviation $\leq 50 \text{ MHz}$
- *4: FM Rate + FM Deviation $\leq 5 \text{ MHz}$

When the FM modulation is executed for the CW signal with fc [Hz], the signal below is created.

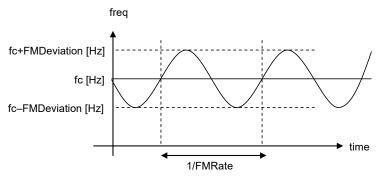


Figure 7.2.2-1 FM Modulation

Remote command	Set the FM frequence Command [:SOURce[1] 2]:F	cy deviation <code>FM[1] 2[:DEViation] <freq></freq></code>
	Query [:SOURce[1] 2]:F	<pre>FM[1] 2[:DEViation]?</pre>
	Response	
	<freq></freq>	Unit: Hz
	Parameter	
	<freq></freq>	FM frequency deviation
	Range	When FM Waveform is Sine:
		0 Hz to $(40 \text{ MHz} - \text{FMDeviation2nd}^{*1})^{*2}$,
		or 0 Hz to (50 MHz–FM Rate) *3
		the maximum is whichever smaller.
		When FM Waveform is other than Sine:
		0 Hz to 4 MHz,
		or 0 Hz to (5 MHz–FM Rate) *4
		or 0 Hz to (40 MHz–FMDeviation2nd*1)*2
		the maximum is the smallest of the three.
	Resolution	0.1 Hz
	Default	1 kHz
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ
		When omitted: HZ
	Programming Example	
	To set the FM frequency deviation to 500 Hz.	
	FM 500	
	FM?	
	> 500.0	

FM modulation frequency: FM Rate

	·			
	or Top>→>Analog/Pulse>FM/ _φ M>FM/ _φ M1 Setup			
	(FM/∲M2 Setup), FM Rate			
	Sets the FM modu	lation frequency.		
	Press F3 FM Rate	on the FM/øM1 Setup (FM/øM2 Setup) function menu		
	to set with the FM	to set with the FM Rate dialog box.		
	Range	 When FM Waveform is Sine: 0.1 Hz to 40 MHz, or (50 MHz–FM Deviation), whichever smaller*1 When FM Waveform is other than Sine: 0.1 Hz to 4 MHz, or (5 MHz–FM Deviation), whichever smaller*2 		
	Resolution	0.1 Hz		
	Default	400 Hz		
		FM Deviation $\leq 50 \text{ MHz}$ FM Deviation $\leq 5 \text{ MHz}$		
Remote command	Remote command Set the FM modulation frequency			
	Command			
	[:SOURce[1] 2]:FM[1] 2:INTernal:FREQuency <freq></freq>			
	Querr			
	Query [:SOURce[1] 2]:FM[1] 2:INTernal:FREQuency?			
	Response			
	<freq></freq>	Unit: Hz		
	Parameter			
	<freq></freq>	FM modulation frequency		
	Range	When FM Waveform is Sine: 0.1 Hz to 40 MHz, or (50 MHz–FM Deviation), whichever smaller*1		
		When FM Waveform is other than Sine: 0.1 Hz to 4 MHz, or (5 MHz–FM Deviation), whichever smaller* ²		
	Resolution	0.1 Hz		
	Default	400 Hz		
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ		
		When omitted: HZ		

Programming Example

To set the FM modulation frequency to 500 Hz. FM:INT:FREQ 500 FM:INT:FREQ? > 500.0

Setup FM Source

or Top>→>Analog/Pulse>FM/∲M>FM/∲M1 Setup (FM/∲M2 Setup), Setup FM Source

Sets the FM modulation signals.

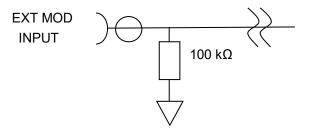
This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press F4 Setup FM Source on the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to open the Setup FM Source function menu.

Page	Key No.	Menu Display	Function
1	F1	FM Source <u>Int</u> Ext	Switches the internal modulation signal/external modulation signal.
	F2	Waveform Sine	Selects the waveform of the internal modulation signal.
	F6	Coupling <u>DC</u> AC	Sets the DC coupling or AC coupling for the external modulation signal.
	F7	Impedance 600 Ω	Sets the termination for the external modulation signal.
	F8	Ext DC Cal	Adjusts the DC offset for the external modulation signal.

Note:

Because the external modulation signal has terminating resistance, some voltage may be generated even if the coupling is set to AC.



Switching FM Source: FM Source

	(FM/ _∲ M2 Setup)	➔)>Analog/Pulse>FM/₀M>FM/₀M1 Setup >Setup FM Source, FM Source I modulation signal.		
	This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.			
	Press F1 FM Sou	Press F1 FM Source on the Setup FM Source function menu for selection		
	Int Ext	Internal modulation signal (Default) External modulation signal		
Remote command	Switch the FM modulation signal Command [:SOURce[1] 2]:FM[1] 2:SOURce INT INT1 INT2 EXT Query [:SOURce[1] 2]:FM[1] 2:SOURce?			
	Response			
	<type></type>	INT or EXT		
	Parameter			
	<type></type>	Туре		
	INT	Internal modulation signal (Default)		
	INT1	Internal modulation signal (Processed as INT)		
	INT2	Internal modulation signal (Processed as INT)		
	EXT	External modulation signal		
	Programming Example			
	To switch the FM modulation signal to the external modulation signal.			
	FM:SOUR EXT			

FM:SOUR EXT FM:SOUR? > EXT

FM Waveform: Waveform

	AM or Top >	⊳Analog/Pulse>FM/ _∲ M>FM/ _∲ M1 Setup	
	(FM/∲M2 Setup)>Setup FM Source, Waveform		
	Selects the waveform of the internal modulation signal.		
	This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.		
	Press F2 Waveform on the Setup FM Source function menu for selection. This can be set when Int is selected in the FM source.		
	Options	Sine (Sine wave) Triangle (Triangular waveform) Square (Square wave) Positive Ramp (Ramp wave (positive)) Negative Ramp (Ramp wave (negative))	
	Default	Sine	
	See Figure 7.2.1-3 for the types of selectable waveforms.		
Remote command	Select the waveform of the internal FM modulation signal Command		
	[:SOURce[1] 2]:FM[1] 2:INTernal:FUNCtion[1] 2:SHAP		
	SINE TRIangle SQUare RAMP		
	Query		
	[:SOURce[1] 2]:FM[1] 2:INTernal:FUNCtion[1] 2:SHAPe?		
	Response		
	<type></type>	SINE, TRI, SQU, RAMP	
	Parameter		
	<type></type>	waveform	
	SINE	Sine (Default)	
	TRIangle	Triangle	
	SQUare	Square	
	RAMP	Ramp	
	Programming Example		
		n of the internal FM modulation signal to the	
	Triangle.		
	FM:INT:FUNC:SHA	P TRI	

FM:INT:FUNC:SHAP?

> TRI

Remote command

Select the shape of the ramp wave Command

[:SOURce[1]|2]:FM[1]|2:INTernal:FUNCtion[1]|2:SHAPe:RAMP POSitive|NEGative

Query

[:SOURce[1]|2]:FM[1]|2:INTernal:FUNCtion[1]|2:SHAPe:RAMP
?

Response

<type>

POS,NEG

Parameter

<type> POSitive NEGative waveform Positive Ramp (Default) Negative Ramp

Programming Example

To set the shape of the ramp wave to the negative ramp. FM:INT:FUNC:SHAP RAMP FM:INT:FUNC:SHAP:RAMP NEG FM:INT:FUNC:SHAP:RAMP? > NEG

Coupling: Coupling

aping. Cooping	(FM/ _∲ M2 Setup)>Setup Sets the DC coupling o This is available only v	halog/Pulse>FM/φM>FM/φM1 Setup o FM Source, Coupling r AC coupling for the external modulation signal. when additional analog modulation input option MG3740A-050/080/150/180) is installed.	
	Press F6 Coupling on the Setup FM Source function menu for selection.		
	DC AC	DC coupling (Default) AC coupling	
Remote command	Command	r AC coupling for the external modulation	
	Query [:SOURce[1] 2]:EXT	Mod:COUPling?	
	Response		
	<type></type>	DC,AC	

	Parameter		
	<type></type>	Coupling	
	DC	DC coupling (Default)	
	AC	AC coupling	
	Programming Ex	kample	
	To set the DC cou	upling for the external modulation.	
	EXTM:COUP DC		
	EXTM:COUP?		
	> DC		
Impedance: Impedance	AM or Top>	∋)>Analog/Pulse>FM/φM>FM/φM1 Setup	
	•	Setup FM Source, Impedance	
	Sets the termina	tion for the external modulation signal.	
		only when additional analog modulation input option 710E/MG3740A-050/080/150/180) is installed.	
	Press F7 Impedance on the Setup FM Source function menu for selection.		
	$50 \ \Omega$	$50 \ \Omega$ termination	
	$600 \ \Omega$	600 Ω termination (Default)	
	Hi-Z	High impedance (100 k Ω /70 pF)	
Remote command	Set the terminati	ion for the external modulation signal	
	Command		
	[:SOURce[1] 2]:EXTMod:IMPedance 50 600 HIZ		
	Query		
	-]:EXTMod:IMPedance?	
	Posponso		
	Response <type></type>	50,600,HIZ	
	Parameter		
	<type></type>	Termination	
	50	50Ω termination	
	600	600Ω termination (Default)	
	HIZ	High impedance (100 k Ω /70 pF)	
	Programming Ex	xample	
		ermination for the external modulation signal.	
	EXTM:IMP 50		
	EXTM: IMP?		
	> = 0		

7-40

> 50

Ext DC Cal: Ext DC Cal

or Top>→>Analog/Pulse>FM/_∲M>FM/_∲M1 Setup (FM/_∲M2 Setup)>Setup FM Source, Ext DC Cal

Adjusts the DC offset for external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

This can be used when in the modulation output status (setting either AM, FM, ϕ M, or Pulse modulations to On, and Mod to On).

When one of the following conditions is met, press **F8 Ext DC Cal** on the Setup FM Source function menu to adjust the DC offset.

- AM = On and AM Source = Ext in AM1 Setup
- AM = On and AM Source = Ext in AM2 Setup
- FM = On and FM Source = Ext in FM1 Setup
- FM = On and FM Source = Ext in FM2 Setup
- ϕM = On and ϕM Source = Ext in $\phi M1$ Setup
- ϕM = On and ϕM Source = Ext in $\phi M2$ Setup

Remote command Adjust the DC offset for external modulation signal Command

:CALibration:EXTernal[1]|2:DC

Parameter

None

Details

As for node :EXTernal[1] | 2, select the external modulation signal for SG1 or the external modulation signal for SG2.Set as follows:

External modulation signal for SG1: :EXTernal1 or EXTernal

External modulation signal for SG2: :EXTernal2

Programming Example

To Adjust the DC offset for external modulation signal. CAL:EXT:DC

FM Phase Adjust: Phase Adjust

or Top>→>Analog/Pulse>FM/_{\$\$}M>FM/_{\$\$}M1 Setup (FM/_{\$\$}M2 Setup), Phase Adjust

Adjusts a phase of internal FM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press F5 Phase Adjust on the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set with the **Phase Adjust** dialog box.

Range-180 deg to +180 degResolution0.1 degDefault0 deg

Remote command

Adjust the phase of internal FM modulation signal Command

[:SOURce[1]|2]:FM[1]|2:INTernal:FUNCtion[1]|2:POFFset
<phase>

Query

[:SOURce[1]|2]:FM[1]|2:INTernal:FUNCtion[1]|2:POFFset?

Response

<phase>

Unit: deg

Parameter

<phase>Phase of internal FM modulation signalRange-180 deg to +180 degResolution0.1 degDefault0 degSuffix codeDEG, When omitted: DEG

Programming Example

To set the phase of internal FM modulation signal to 10 deg. FM:INT:FUNC:POFF 10 FM:INT:FUNC:POFF? > 10.0

_φM modulation On/Off: _φM

or Top>→>Analog/Pulse>FM/_φM>FM/_φM1 Setup (FM/_φM2 Setup)>→, _φM

Enables/disables the ϕM (phase) modulation.

Press F1 ϕM in the second page of the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set On/Off.

OffDisables φM Modulation (Default).OnEnables φM Modulation.

The ϕM modulation cannot be set to On at the same time with the FM modulation.

Remote command

Enable/disable the ϕM modulation Command

[:SOURce[1]|2]:PM[1]|2:STATe <boolean>

Query

[:SOURce[1]|2]:PM[1]|2:STATe?

Response

<boolean> 0 or 1

Parameter

<boolean></boolean>	φM Modulation On/Off
OFF 0	Disables ϕM Modulation (Default).
ON 1	Enables ϕM Modulation.

Programming Example

To set the ϕM modulation to On. PM:STAT ON PM:STAT? > 1

Deviation

Image: Sector of the secto

(FM/_{\$\$\$}M2 Setup)>→, _{\$\$\$}M Deviation

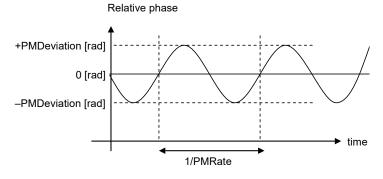
Sets the ϕM deviation angle.

Press F2 ϕ M Deviation in the second page of the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set with the ϕM Deviation dialog box.

Range	When ϕM Waveform is Sine:	
	0 rad to 160 rad, or (40 MHz \div ϕM Rate) rad,	
	whichever smaller ^{*1}	
	When ϕM Waveform is other than Sine:	
	0 rad to 160 rad, or (4 MHz $\div \phi$ M Rate) rad,	
	whichever smaller*2	
Resolution	0.001 rad	
Default	0 rad	
*1: $\phi M \text{ Rate} \times \phi M \text{ Deviation} \le 40 \text{ MHz}$		

*2: ϕM Rate × ϕM Deviation $\leq 4~MHz$

When the ϕM modulation is executed for the CW signal, the signal below is created.



Remote command	Set the ϕ M deviation angle
	Command
	[:SOURce[1] 2]:PM[1] 2[:DEViation] <ext_numeric></ext_numeric>

Query

[:SOURce[1]|2]:PM[1]|2[:DEViation]?

Response

<ext numeric>

Parameter		
<ext_numeric></ext_numeric>	ϕM deviation angle	
Range	When ϕM Waveform is Sine:	
	0 rad to 160 rad,	
	or (40 MHz ÷ ϕ M Rate) rad, whichever smaller ^{*1}	
	When ϕM Waveform is other than Sine:	
	0 rad to 160 rad,	
	or (4 MHz $\div \phi M$ Rate) rad, whichever smaller *2	
Resolution	0.001 rad	
Default	0 rad	
Suffix code	None	

Programming Example

To set the ϕM frequency deviation to 50 rad. PM 50 PM? > 50.000

φM modulation frequency: **φM** Rate

or Top>→>Analog/Pulse>FM/_φM>FM/_φM1 Setup (FM/_φM2 Setup)>→, _φM Rate

Sets the ϕM modulation frequency.

Press **F3** ϕ **M Rate** in the second page of the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to set with the ϕ **M Rate** dialog box.

Range	When ϕM Waveform is Sine:		
	0.1 Hz to 40 MHz,		
	or (40 MHz ÷ ϕ M Deviation) MHz,		
	whichever smaller ^{*1}		
	When ϕM Waveform is other than Sine:		
	0.1 Hz to 4 MHz,		
	or (4 MHz ÷ ϕ M Deviation) MHz,		
	whichever smaller ^{*2}		
Resolution	0.1 Hz		
Default	400 Hz		
*1: M Rato X M Do	viation $< 40 \text{ MHz}$		

*1: ϕ M Rate × ϕ M Deviation ≤ 40 MHz

*2: $\phi M \operatorname{Rate} \times \phi M \operatorname{Deviation} \le 4 \operatorname{MHz}$

Remote command	Set the ∮M modulation Command [:SOURce[1] 2]:PM[<pre>frequency 1] 2:INTernal:FREQuency <freq></freq></pre>
	Query	
	[:SOURce[1] 2]:PM[1] 2:INTernal:FREQuency?
	Response	
	<freq></freq>	Unit: Hz
	Parameter	
	<freq></freq>	φM modulation frequency
	Range	When \$\$M Waveform is Sine: 0.1 Hz to 40 MHz, or (40 MHz ÷ \$\$M Deviation) MHz, whichever smaller When \$\$M Waveform is other than Sine: 0.1 Hz to 4 MHz, or (4 MHz ÷ \$\$M Deviation) MHz,
		whichever smaller
	Resolution	0.1 Hz
	Default	400 Hz
	Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ
		When omitted: HZ
	Programming Example	•
	To set the ϕM modulation	on frequency to 500 Hz.

PM:INT:FREQ 500 PM:INT:FREQ? > 500.0

or Top>→>Analog/Pulse>FM/_φM>FM/_φM1 Setup (FM/_φM2 Setup)>→, Setup _φM Source

Sets the ϕM modulation signals.

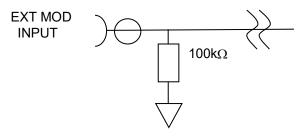
This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

Press F4 Setup ϕM Source in the second page of the FM/ ϕ M1 Setup (FM/ ϕ M2 Setup) function menu to open the Setup ϕM Source function menu.

Page	Key No.	Menu Display	Function
1	F1	φM Source <u>Int</u> Ext	Switch the internal modulation signal/external modulation signal.
	F2	Waveform Sine	Selects the waveform of the internal modulation signal. This can be selected when Int is selected in the ϕ M source.
	F6	Coupling <u>DC</u> AC	Sets the DC coupling or AC coupling for the external modulation signal.
	F7	Impedance 600 Ω	Sets the termination for the external modulation signal.
	F8	Ext DC Cal	Adjusts the DC offset for the external modulation signal.

Note:

Because the external modulation signal has terminating resistance, some voltage may be generated even if the coupling is set to AC.



Switching $_{\varphi}M$ Source: $_{\varphi}M$ Source

	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$			
		This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.		
	Press F1 ϕM Source on the Setup ϕM Source function menu for selecti			
	Int Ext	Internal modulation signal (Default) External modulation signal		
Remote command	Switch the ϕ M modulation signal Command [:SOURce[1] 2]:PM[1] 2:SOURce INT INT1 INT2 EXT			
	Query [:SOURce[1] 2	2]:PM[1] 2:SOURce?		
	Response			
	<type></type>	INT or EXT		
	Parameter			
	<type></type>	Туре		
	INT	Internal modulation signal (Default)		
	INT1	Internal modulation signal (Processed as INT)		
	INT2	Internal modulation signal (Processed as INT)		
	EXT	External modulation signal		
	Programming E	xample		
		I modulation signal to the external modulation signal.		

To switch the ϕM modulation signal to the external modulation PM:SOUR EXT PM:SOUR? > EXT

$_{\varphi}M$ Waveform: Waveform

	or Top>→>Analog/Pulse>FM/₀M>FM/₀M1 Setup			
	(FM/∲M2 Setup)>⊖>>Setup ∲M Source, Waveform			
	Selects the waveform of the ϕM internal modulation signal.			
	This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.			
	Press F2 Waveform on the Setup ϕ M Source function menu for selection. This can be set when Int is selected in the ϕ M source.			
	Options	Sine (Sine wave) Triangle (Triangular waveform) Square (Square wave) Positive Ramp (Ramp wave (positive)) Negative Ramp (Ramp wave (negative))		
	Default	Sine		
		the types of selectable waveforms.		
	500 i iguio 1.2.1 0 101			
Remote command	Select the waveform o	of the internal ϕM modulation signal		
	Command			
	[:SOURce[1] 2]:PM[1] 2:INTernal:FUNCtion[1] 2:SHAPe			
	SINE TRIangle SQUare RAMP			
	Query			
	[:SOURce[1] 2]:PM[1] 2:INTernal:FUNCtion[1] 2:SHAPe?			
	Response			
	<type></type>	SINE, TRI, SQU, RAMP		
	Parameter			
	<type></type>	waveform		
	SINE	Sine (Default)		
	TRIangle	Triangle		
	SQUare	Square		
	RAMP	Ramp		
	Programming Exampl	e		
	To set the waveform of the internal ϕM modulation signal to the Triangle.			
	DM. TNE, EUNO, OUAD EDT			

PM:INT:FUNC:SHAP TRI

PM:INT:FUNC:SHAP?

> TRI

Remote command

Select the shape of the ramp wave Command

[:SOURce[1]|2]:PM[1]|2:INTernal:FUNCtion[1]|2:SHAPe:RAMP POSitive | NEGative

Query

```
[:SOURce[1]|2]:PM[1]|2:INTernal:FUNCtion[1]|2:SHAPe:RAMP
?
```

Response

<type>

POS,NEG

Parameter

<type>

<type> POSitive NEGative

waveform Positive Ramp (Default) Negative Ramp

Programming Example

To set the shape of the ramp wave to the negative ramp. PM:INT:FUNC:SHAP RAMP PM:INT:FUNC:SHAP:RAMP NEG PM:INT:FUNC:SHAP:RAMP? > NEG

Coupli

upling: Coupling				
	AM or Top>→)>Analog/Pulse>FM/ _∲ M>FM/ _∲ M1 Setup		
	(FM/ _∲ M2 Setup)>⊖>>Setup _∲ M Source,Coupling			
	Sets the DC coupling or AC coupling for the external modulation sign			
	This is available o	nly when additional analog modulation input option		
	(MG3710A/MG37	10E/MG3740A-050/080/150/180) is installed.		
	Press F6 Coupling	${\boldsymbol{g}}$ on the Setup ϕM Source function menu for selection.		
	DC	DC coupling (Default)		
	AC	AC coupling		
Remote command	Set the DC coupling or AC coupling for the external modulation			
	Command			
	[:SOURce[1] 2]	:EXTMod:COUPling DC AC		
	Query			
	[:SOURce[1] 2]	:EXTMod:COUPling?		
	Response			

DC,AC

	Parameter		
	<type></type>	Coupling	
	DC	DC coupling (Default)	
	AC	AC coupling	
	Programming Exampl	e	
	To set the DC coupling for the external modulation.		
	EXTM:COUP DC		
	EXTM:COUP?		
	> DC		
Impedance: Impedance			
	\land or Top $> \rightarrow > A$	nalog/Pulse>FM/₀M>FM/₀M1 Setup	
	(FM/₀M2 Setup)>⊖>Setup ₀M Source,Impedance		
	Sets the termination for the external modulation signal.		
	This is available only when additional analog modulation input option		
	(MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.		
	Press F7 Impedance on the Setup ϕ M Source function menu for selection.		
	$50 \ \Omega$	50 Ω termination	
	$600 \ \Omega$	600 Ω termination (Default)	
	Hi-Z	High impedance (100 k Ω /70 pF)	
Remote command	Set the termination fo	r the external modulation signal	
	Command		
	[:SOURce[1] 2]:EX	IMod:IMPedance 50 600 HIZ	
	Query		
	[:SOURce[1] 2]:EX	IMod:IMPedance?	

Response

<type>

50,600,HIZ

Parameter

<type></type>	Termination
50	$50 \ \Omega$ termination
600	600 Ω termination (Default)
HIZ	High impedance (100 k Ω /70 pF)

Programming Example

To set the 50 Ω termination for the external modulation signal. EXTM: IMP 50 EXTM: IMP? > 50

Ext DC Cal: Ext DC Cal

	or Top>>>Analog/Pulse>FM/ ϕ M>FM/ ϕ M1 Setup (FM/ ϕ M2 Setup)>>>>Setup ϕ M Source,Ext DC Cal Adjusts the DC offset for external modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.
	This can be used when in the modulation output status (setting either AM, FM, ϕ M, or Pulse modulations to On, and Mod to On).
	When one of the following conditions is met, press F8 Ext DC Cal on the Setup ϕ M Source function menu to adjust the DC offset.
	 AM = On and AM Source = Ext in AM1 Setup AM = On and AM Source = Ext in AM2 Setup FM = On and FM Source = Ext in FM1 Setup FM = On and FM Source = Ext in FM2 Setup \$\$\overline{M}\$ = On and \$\$\overline{M}\$ Source = Ext in \$\$\overline{M}\$ 1 Setup \$\$\$\overline{M}\$ = On and \$\$\$\overline{M}\$ Source = Ext in \$
Remote command	Adjust the DC offset for external modulation signal Command :CALibration:EXTernal[1] 2:DC
	Parameter None
	Details As for node :EXTernal [1] 2, select the external modulation signal for SG1 or the external modulation signal for SG2 .Set as follows:
	External modulation signal for SG1: :EXTernal1 or EXTernal External modulation signal for SG2: :EXTernal2
	Programming Example

or Top>→>Analog/Pulse>FM/_{\$\$}M>FM/_{\$\$}M1 Setup (FM/_{\$\$}M2 Setup)>→, Phase Adjust

Adjusts a phase of internal ϕM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3710E/MG3740A-050/080/150/180) is installed.

 $\label{eq:FS} \mbox{F5 Phase Adjust} \quad \mbox{in the second page of the FM/} \mbox{M1 Setup} $$ (FM/ϕM2 Setup) function menu to set with the$ **Phase Adjust**dialog box.

Range-180 deg to +180 degResolution0.1 degDefault0 deg

Remote command

Adjust the phase of internal **∳M modulation signal** Command

[:SOURce[1]|2]:PM[1]|2:INTernal:FUNCtion[1]|2:POFFset
<phase>

Query

[:SOURce[1]|2]:PM[1]|2:INTernal:FUNCtion[1]|2:POFFset?

Response

<phase>

Unit: deg

Parameter

<phase> Range Resolution Default Suffix code Phase of internal *φ*M modulation signal −180 deg to +180 deg 0.1 deg 0 deg DEG, When omitted: DEG

Programming Example

To set the phase of internal ϕM modulation signal to 10 deg. PM:INT:FUNC:POFF 10 PM:INT:FUNC:POFF? > 10.0

7.2.3 Pulse

Pulse) or Top> >> Analog/Pulse>Pulse

Sets the settings related to Pulse modulation.

Press **Pulse** of the main function key or **F3 Pulse** on the Analog Mod function menu to display the Pulse function menu.

Settings related to Pulse modulation are disabled when Sweep/List is being executed.

The pulse modulation can be executed as follows:

Pulse modulation with the internal signal Set it with **Pulse Source** in the Pulse function menu.

Pulse modulation with RF Gate

For the pulse modulation method with the pulse modulation control bit (RF Gate) added to the waveform pattern, refer to 4.5.5 "Input file format" in the *MG3700A* /*MG3710A*/*MG3710E* Vector Signal Generator *MG3740A* Analog Signal Generator Operation Manual (IQproducerTM), and for the RF Gate setting method, refer to 7.3.7 "RF Gate" in this document.

Pulse modulation with the external signal

When the external signal is used, select **Ext Pulse** with the **Pulse Source** function menu in the Pulse function menu to input the modulated signal from the AUX connector on the rear panel. Refer to Table 3.1.2-1 "AUX Connectors".

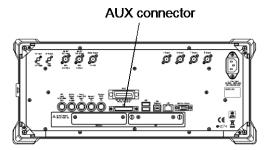


Figure 7.2.3-1 External Pulse Modulated Signal Input (Pulse Mod) Connector

Use the following terminals of the AUX connector to execute the Pulse modulation with the external signal.

• Pulse Mod terminal The Pulse modulation signal (TTL level and DC-coupling) is input.

Example: To execute the Pulse modulation.

- 1. Set the Pulse modulation to On with **F1 Pulse**.
- 2. Select the Pulse modulation signal source with **F2 Pulse Source**.
- 3. Set the settings of **F3 Pulse Rate** to **F8 Pulse 2 Width** according to the Pulse modulation signal source.
- 4. Set the output polarity of Pulse Sync signal and Pulse Video signal with **F1 Ext. Out Polarity** in Page 2.
- 5. Set the polarity of the signal input from the Pulse Mod connector with **F2 Ext. In Polarity** in Page 2.
- 6. Press **RF Output On/Off** to light the LED to set the RF output to On.
- 7. Press **Mod On/Off** to light the LED to start the Pulse modulation.

Page	Key No.	Menu Display	Function
1	F1	Pulse	Enables/disables the Pulse modulation.
		<u>Off</u> On	
	F2	Pulse Source	Selects the Pulse modulation signal source.
		Freerun	
	F3	Pulse Rate	Sets the Pulse modulation frequency.
		400.0 Hz	
	F4	Pulse Period	Sets the Pulse modulation period.
		$4.00 \ \mu s$	
	F5	Pulse Delay	Sets the Pulse modulation delay time after the trigger
		$0.00000000 \mathrm{s}$	event.
	F6	Pulse Width	Sets the Pulse modulation width.
		$2.00 \ \mu s$	
	$\mathbf{F7}$	Pulse 2 Delay	Sets the delay time of the second Pulse after the first
		$0.00000000 \mathrm{s}$	Pulse.
	F8	Pulse 2 Width	Sets the second Pulse width.
		$2.00 \ \mu s$	
2	F1	Ext Out Polarity	Selects the polarity of the Pulse Sync signal and Pulse
		<u>Positive</u> Negative	Video signal.
	F2	Ext In Polarity	Selects the polarity of the signal input from the Pulse
		<u>Positive</u> Negative	Mod terminal.

Table 7.2.3-1 Pulse Function Menu

Pulse			
	Pulse or Top>→>Analog/Pulse>Pulse , Pulse Enables/disables the Pulse modulation.		
	Press F1 Pulse on the Pulse function menu to set On/Off.		
	Off Disables Pulse modulation (Default).		
	On	Enables Pulse modulation.	
Remote command	Enable/disable the Pulse modulation Command		
	[:SOURce[1] 2]:PULM:STATe <boolean> Query</boolean>		
	[:SOURce[1] 2]:PULM:STATe?		
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	Pulse Modulation On/Off	
	OFF 0	Disables Pulse modulation (Default).	
	ON 1	Enables Pulse modulation.	
	Programming Examp	le	
	To set the Pulse modulation to On.		
	PULM:STAT ON		
	PULM:STAT?		
	> 1		

Pulse Source

Pulse or Top>>>>Analog/Pulse>Pulse,Pulse Source

Selects the Pulse modulation signal source.

Press **F2 Pulse Source** on the Pulse function menu to open the Pulse Source function menu for selection.

Page	Key No.	Menu Display	Function	
1	F1	Square	Internal freerun pulse string with 50% of duty cycle. The period is set with Pulse Rate. Pulse	
	F2	Freerun	Internal freerun pulse string (Default) The period and pulse width are set with Pulse Period and Pulse Width. Pulse Pulse Time	
	F3	Triggered	Generates the pulse in synchronization with the trigger event. The delay time after the trigger event and pulse width are set with Pulse Delay and Pulse Width. Trigger PulseDelay PulseDelay PulseWidth PulseWidth Trigger inputs executed between the trigger input and the pulse completion are ignored.	

Table 7.2.3-2 Pulse Source Function Menu

Page	Key No.	Menu Display	Function		
1	F4	Adjustable Doublet	Generates two pulses in synchronization with the trigger event. The delay time after the trigger event and pulse width are set with Pulse Delay and Pulse 2 Delay, and Pulse Width and Pulse 2 Width. The second pulse delay is based on the first pulse rise. Trigger PulseDelay Pulse2Delay Pulse2Width Pulse Trigger inputs executed between the trigger input and the pulse completion are ignored.		
	F5	Trigger Doublet	Generates two pulses in synchronization with the trigger event. The delay time after the trigger event and pulse width are set with Pulse Delay and Pulse Width. The first pulse synchronizes with the external trigger signal. The second pulse delay is based on the first pulse rise. Trigger PulseDelay PulseWidth Pulse Trigger inputs executed between the trigger input and the pulse completion are ignored.		

Table 7.2.3-2 Pulse Source Function Menu (Cont'd)

Page	Key No.	Menu Display	Function		
1	F6	Gated	Generates the internal pulse string. However, pulses are valid only when the trigger is being input. The period and pulse width are set with Pulse Period and Pulse Width. Trigger		
	F7	Ext Pulse	Generates the pulse signal in synchronization with the external trigger signal. Trigger Pulse Time		

Table 7.2.3-2 Pulse Source Function Menu (Cont'd)

Note:

For specifications of pulse signal, refer to Appendix A, subsection "<Analog modulation/Pulse modulation>".

Remote command	Select the Pulse modulation signal source from Freerun or Ext Pulse				
	Command [:SOURce[1] 2]:PULM:SOURce INTernal EXTernal				
	Query				
	[:SOURce[1] 2]:PULM:SOURce?				
	Response				
	<type></type>	INT or EXT			
	Parameter				
	<type></type>	Signal source			
	INTernal	Freerun (Default)			
	EXTernal	Ext Pulse			
	Programming Example				
	To set the Pulse modulation signal source to Freerun.				
	PULM:SOUR INT				
	PULM:SOUR?				
	> INT				
Remote command	Select the Pulse n	nodulation signal source from seven types			
	Command				
	[:SOURce[1] 2]:PULM:SOURce:INTernal				
	SQUare FRUN TRIGgered ADOublet DOUBlet GATed EXTPulse				
	Query				
	[:SOURce[1] 2]:PULM:SOURce:INTernal?				
	Response				
	<type></type>	SQU,FRUN,TRIG,ADO,DOUB,GAT or EXTP			
	Parameter				
	<type></type>	Signal source			
	SQUare	Square			
	FRUN	Freerun (Default)			
	TRIGgered	Triggered			
	ADOublet	Adjustable Doublet			
	DOUBlet	Trigger Doublet			
	GATed	Gated			
	EXTPulse	Ext Pulse			

Programming Example

To set the Pulse modulation signal source to Freerun. PULM:SOUR:INT FRUN PULM:SOUR:INT? > FRUN

Pulse Rate

Pulse or Top>>>>Analog/Pulse>Pulse, Pulse Rate

Sets the Pulse modulation frequency.

Press **F3 Pulse Rate** on the Pulse function menu to set with the **Pulse Rate** dialog box. This can be set when **Square** is selected at **Pulse Source**.

Range	$0.1 \mathrm{Hz}$ to $10 \mathrm{MHz}$
Resolution	$0.1~\mathrm{Hz}$
Default	400 Hz

Remote command Set the Pulse modulation frequency Command

[:SOURce[1]|2]:PULM:INTernal:FREQuency <freq>

Query

[:SOURce[1]|2]:PULM:INTernal:FREQuency?

Response

<freq>

Unit: Hz

Parameter

<freq></freq>	Frequency
Range	0.1 Hz to 10 MHz
Resolution	0.1 Hz
Default	400 Hz
Suffix code	HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ
	When omitted: HZ

Details

This can be set when **Square** is selected at Pulse modulation signal source.

Programming Example

To set the Pulse modulation frequency to 500 Hz. PULM:INT:FREQ 500 PULM:INT:FREQ? > 500.0

Pulse Period

Pulse) or Top>>>>Analog/Pulse>Pulse,Pulse Period

Sets the Pulse modulation period.

Press **F4 Pulse Period** on the Pulse function menu to set with the **Pulse Period** dialog box. This can be set when **Freerun**, **Gated** is selected at Pulse Source.

Range	$10~\mathrm{ns}$ to $20~\mathrm{s}$
Resolution	10 ns
Default	4 μs

Remote command

Set the Pulse modulation period Command

[:SOURce[1]|2]:PULM:INTernal:PERiod <time>

Query

[:SOURce[1]|2]:PULM:INTernal:PERiod?

Response

<time>

Unit: S

Parameter

<time> Range Resolution Default Suffix code Period 10 ns to 20 s 10 ns 4 μs S, MS, US, NS, PS, When omitted: S

Details

This can be set when **Freerun**, **Gated** is selected at Pulse modulation signal source.

Programming Example

To set the Pulse modulation period to 15 µs. PULM:INT:PER 15US PULM:INT:PER? > 0.00001500

Pulse Delay

Pulse or Top>>>>>Analog/Pulse>Pulse, Pulse Delay

Sets the Pulse modulation delay time after the trigger event.

Press **F5 Pulse Delay** on the Pulse function menu to set with the **Pulse Delay** dialog box. This can be set when **Triggered**, **Adjustable Doublet**, **Trigger Doublet** is selected at Pulse Source.

Range	$0~\mathrm{s}$ to $20~\mathrm{s}-\mathrm{Pulse}$ Width
Resolution	10 ns
Default	0 s

Remote command

Set the Pulse modulation delay time Command [:SOURce[1]|2]:PULM:INTernal:DELay[1]|2 <time>

Query

[:SOURce[1]|2]:PULM:INTernal:DELay[1]|2?

Response

<time>

Unit: S

Parameter

<time></time>	Delay time
Range	0 s to $20 s$ – Pulse Width
Resolution	10 ns
Default	0 s
Suffix code	S, MS, US, NS, PS, When omitted: S

Details

This can be set when **Triggered**, **Adjustable Doublet**, **Trigger Doublet** is selected at Pulse modulation signal source.

As for node : DELay[1] | 2, select Pulse 1 Delay or Pulse 2 Delay. Set as follows:

Pulse Delay: :DELay1 or :DELay

Pulse 2 Delay: :DELay2

Programming Example

To set the delay time after the first Pulse modulation trigger event to 15 μ s. PULM:INT:DEL 15US PULM:INT:DEL?

Pulse Width

Pulse or Top> > Analog/Pulse> Pulse, Pulse Width

Sets the Pulse modulation width.

Press **F6 Pulse Width** on the Pulse function menu to set with the **Pulse Width** dialog box. This can be set when **Freerun**, **Triggered**, **Adjustable Doublet**, **Trigger Doublet**, **Gated** is selected at Pulse Source.

Setting range				
Lower limit	10 ns			
Upper limit	Pulse Period ^{*1}			
	$20 \text{ s} - \text{Pulse Delay}^{*2}$			
	*1: When Pulse Source is set to Freerun or			
	Gated			
	*2: When Pulse Source is Triggered,			
	Adjustable Doublet, or Trigger Doublet			
Resolution	10 ns			
Default	2 µs			

Remote command Set the Pulse modulation width

Command

[:SOURce[1]|2]:PULM:INTernal:PWIDth[1]|2 <time>

Query

[:SOURce[1]|2]:PULM:INTernal:PWIDth[1]|2?

Response

<time>

Unit: S

Parameter

<time></time>	Pulse modulation width	
Setting range		
Lower limit	10 ns	
Upper limit	Pulse Period	
	(When Pulse Source is set to Freerun or Gated)	
	20 s – Pulse Delay	
	(When Pulse Source is Triggered, Adjustable	
	Doublet, or Trigger Doublet)	
Resolution	10 ns	
Default	2 µs	
Suffix code	S, MS, US, NS, PS, When omitted: S	

Details

This can be set when **Freerun**, **Triggered**, **Adjustable Doublet**, **Trigger Doublet**, **Gated** is selected at Pulse modulation signal source.

As for node : PWIDth[1] | 2, select Pulse Width or Pulse 2 Width. Set as follows:

Pulse Width: : PWIDth1 or : PWIDth

Pulse 2 Width: : PWIDth2

Programming Example

To set the first Pulse modulation width to 5 µs. PULM:INT:PWID 5US PULM:INT:PWID? > 0.00000500

Pulse	2	Del	lay
-------	---	-----	-----

Pulse or Top> \rightarrow >Analog/Pulse>Pulse, Pulse 2 Delay

Sets the delay time of the second Pulse after the first Pulse.

Press **F7 Pulse 2 Delay** on the Pulse function menu to set with the **Pulse 2 Delay** dialog box. This can be set when **Adjustable Doublet** is selected at **Pulse Source.**

Range	$0~{\rm s}$ to $20~{\rm s}-{\rm Pulse}~2$ Width – Pulse Delay
Resolution	10 ns
Default	0 s

Remote command Set the delay time of the second Pulse after the first Pulse Command

[:SOURce[1]|2]:PULM:INTernal:DELay[1]|2 <time>

Query

[:SOURce[1]|2]:PULM:INTernal:DELay[1]|2?

Response

<time>

Unit: S

Parameter

<time></time>	The delay time from the first Pulse to the second	
	Pulse	
Range	$0~{\rm s}$ to $20~{\rm s}-{\rm Pulse}$ 2 Width – Pulse Delay	
Resolution	10 ns	
Default	0 s	
Suffix code	S, MS, US, NS, PS, When omitted: S	

	Details This can be set w signal source.	hen Adjustable Doublet is selected at Pulse modulation	
	As for node : DEL. follows:	ay[1] 2, select Pulse Delay or Pulse 2 Delay. Set as	
	Pulse Delay:: : DE	Lay1 or : DELay.	
	Pulse 2 Delay:: :DELay2.		
	Programming Ex To set the delay to PULM:INT:DEL2 PULM:INT:DEL2 > 0.00000500	ime from the first Pulse to the second Pulse to 5 μs. 5US	
Pulse 2 Width	Pulse or Top >	>Analog/Pulse>Pulse, Pulse 2 Width Pulse width.	
	Press F8 Pulse 2 Width on the Pulse function menu to set with the Pulse 2 Width dialog box. This can be set when Adjustable Doublet is selected at Pulse Source.		
	Range Resolution Default	10 ns to 20 s – Pulse Delay – Pulse 2 Delay 10 ns 2 μs	
Remote command	Set the second P Command [:SOURce[1] 2]	ulse width]:PULM:INTernal:PWIDth[1] 2 <time></time>	

Query

[:SOURce[1]|2]:PULM:INTernal:PWIDth[1]|2?

Response

<time>

Unit: S

Parameter

The second Pulse width
10 ns to 20 s – Pulse Delay – Pulse 2 Delay
10 ns
2 µs
S, MS, US, NS, PS, When omitted: S

Details

This can be set when **Adjustable Doublet** is selected at Pulse modulation signal source.

As for node : PWIDth[1] | 2, select Pulse Width or Pulse 2 Width. Set as follows:

Pulse Width: : PWIDth1 or : PWIDth

Pulse 2 Width: : PWIDth2

Programming Example

To set the second Pulse width to 5 µs. PULM:INT:PWID2 5US PULM:INT:PWID2? > 0.00000500

Pulse Sync/Pulse Video output signal polarity: Ext. Out Polarity

Pulse or Top> \rightarrow >Analog/Pulse>Pulse, > \rightarrow > Ext. Out Polarity Selects the output polarity of the Pulse Sync signal and Pulse Video signal.

Press **F1 Ext. Out Polarity** on page 2 of the Pulse function menu for selection.

Select the output polarity of the Pulse Sync signal and Pulse Video

Positive	Positive polarity (Default)
Negative	Negative polarity

Remote command

signal

Command

[:SOURce[1]|2]:PULM:INTernal[1]:VIDeo:POLarity NORMal|INVerted

Query

[:SOURce[1]|2]:PULM:INTernal[1]:VIDeo:POLarity?

Response

<mode>

NORM or INV

Parameter <mode>

NORMal

INVerted

Output polarity of the Pulse Sync signal and Pulse Video signal Positive polarity (Default) Negative polarity

Programming Example

To set the output polarity of the Pulse Sync signal and Pulse Video signal to the negative polarity. PULM:INT:VID:POL INV PULM:INT:VID:POL? > INV

Pulse Mod input signal polarity: Ext. In Polarity

Pulse or Top> \rightarrow >Analog/Pulse>Pulse, > \rightarrow > Ext. In Polarity Selects the polarity of the signal input from the Pulse Mod terminal.

Press **F2 Ext. In Polarity** on page 2 of the Pulse function menu for selection.

PositivePositive polarity (Default)NegativeNegative polarity

Remote command Select the polarity of the signal input from the Pulse Mod terminal Command

[:SOURce[1]|2]:PULM:EXTernal:POLarity NORMal|INVerted

Query

[:SOURce[1]|2]:PULM:EXTernal:POLarity?

Response

<mode>

NORM or INV

Parameter

<mode>

NORMal

INVerted

Input polarity of the Pulse Sync signal and Pulse Video signal Positive polarity (Default) Negative polarity

Programming Example

To set the polarity of the signal input from the Pulse Mod terminal to the negative polarity. PULM:EXT:POL INV PULM:EXT:POL? > INV

7.2.4 Optimize Function for the Analog Modulation: Optimize

 \land or \swarrow (Back key)>**Optimize**,

or Top> > Analog/Pulse> Optimize

Selects Spurious Mode or Distortion Mode to optimize analog modulation.

Press F8 Optimize on the Analog Pulse function menu for selection.

Spurious	Disables the frequency offset.	
	(Default for MG3710A/MG3710E)	
Distortion	Enables the frequency offset.	
	(Default for MG3740A)	

Because the MG3710A/MG3710E/MG3740A performs analog modulation by quadrature modulator, carrier leak causes distortions. To avoid the distortions, analog modulation is performed with frequency offset in the baseband (Distortion Mode).

However, when analog modulation is performed with frequency offset, carrier leak and image are generated in the frequency different from the original harmonic spurious. To avoid the problem, the mode is switchable to Spurious Mode which allows analog modulation without frequency offset.

When set to Distortion Mode, RF Frequency and Display Frequency are displayed in the Frequency Information Frame as in the figure below. The analog modulation signal is output in Display Frequency.

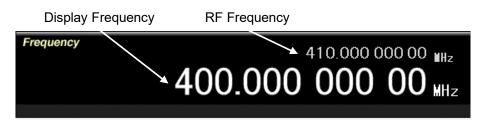


Figure 7.2.4-1 Frequency Information Frame in Distortion Mode

Notes:

- Distortion Mode's level accuracy is degraded because the frequency offset is applied.
- When the output frequency becomes under 7 MHz, Distortion Mode is automatically switched to Spurious Mode. To use Distortion Mode in 7 MHz or higher, execute re-setting.

Remote command	Command	ffset of the analog modulation
	Query [:SOURce[1] 2]:AOB	PTimize:MODE?
	Response	
	<type></type>	SPUR or DIST
	Parameter	
	<type></type>	Туре
	SPURious	Disables the frequency offset.
		(Default for MG3710A/MG3710E)
	DISTortion	Enables the frequency offset.
		(Default for MG3740A)
	Programming Example	9

To enable the frequency offset of the analog modulation. AOPT:MODE DIST AOPT:MODE? > DIST

7.3 Baseband Mode

Mode or Top>Mode

MG3710A/MG3710E/MG3740A allows reproducing the waveform pattern to execute the vector modulation with the pattern.

Note:

MG3740A allows to execute the vector modulation only when option-020/120 is installed.

The waveform patterns are stored as the pattern file in the internal HDD of MG3710A/MG3710E/MG3740A. Furthermore, a folder to classify the patterns according to the types is called a "package".

When reproducing the waveform pattern, it is necessary first to load the package pattern stored in the internal hard disk into the waveform memory. MG3710A/MG3710E/MG3740A has two waveform memories of I and Q which have two channels configuration, and the package pattern is loaded into either one or both of them.

Next, the pattern to be output is selected among the patterns loaded into the waveform memory. One for each Memory A and B can be selected. Either one of patterns of Memory A and B or the combination of patterns of Memory A and B is output.

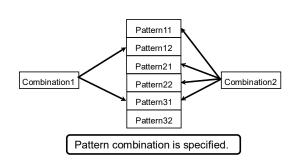
Note:

The operation to combine the patterns of Memory A and B to output requires the Combination of Baseband Signal option (option-048/148, option-078/178). If not installed, Memory B cannot be used.

In addition, a file called the combination file exists in the package. The combination of patterns to be output is specified and the output level ratio and others are set for this combination file. When the combination file is selected, the pattern is output as specified in the file; therefore the selection for each memory as above is not required.

The state where the pattern is output as the specification in the file after the combination file is selected or the pattern file is selected only for Memory A (B) is called the Defined mode. On the other hand, the state where the pattern is selected for each of Memory A and B, and the output level ratio and others are set on the digital modulation setting screen is called the Edit mode.

In this document, the pattern file and combination file are called the waveform file collectively, and in MG3710A/MG3710E/MG3740A, the pattern file and combination file are used unconsciously.





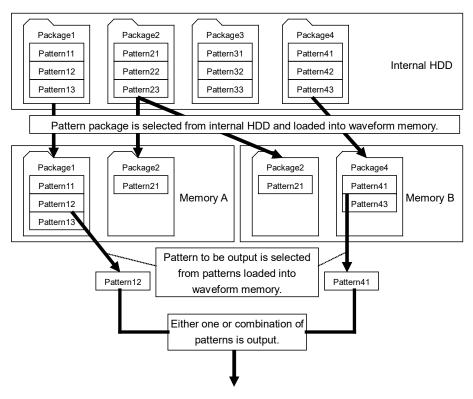


Figure 7.3-2 Outline of Waveform Pattern Output

The following are methods to add a new package pattern to the internal hard disk:

- Uses an USB memory or others. For the method using a USB memory, refer to 7.3.6 "Copying external waveform pattern: Copy".
- Transfers from an external personal computer using IQproducerTM (supplied application software).
- Creates the waveform pattern with IQproducer[™] (supplied application software) installed in the MG3710A/MG3710E/MG3740A.

For the method to transfer with IQproducerTM, refer to the *MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A* Analog Signal Generator Operation Manual (IQproducerTM).

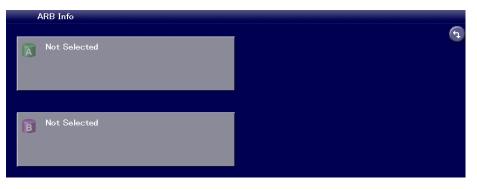
7.3.1 ARB

Mode or Top>Mode

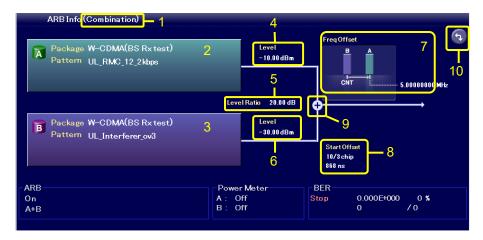
Generates modulated signals with arbitrary waveform patterns.

In MG3740A, the ARB function can be used only when option-020/120 is installed.

Press **Mode** of the main function key or F4 **Mode** on the top function menu to display the **ARB Info** dialog box and ARB/Waveform function menu.







After waveform file is selected

Figure 7.3.1-1 ARB Info Dialog Box

7.3 Baseband Mode

No.	Display Example	Display	Description
			Other than the below
		Combination	Indicates to combine the waveform patterns of Memory A and Memory B to output. A+B
1	Combination	Sequence	Indicates that it is in the sequence mode. Seq.(A), Seq.(A+AWGN)
1	Combination	Sequence +	Indicates that it is in the sequence mode with Add Pattern. Seq.(A+B)
		Multiplex	Indicates Multiplex waveform output. (Multiplex)
			Indicates Memory A.
		Not Selected	Indicates that no waveform is selected.
2	A	Package	Waveform package name for the waveform output from Memory A
		Pattern	Waveform file name for the waveform output from Memory A
			Indicates Memory B.
		Not Selected	Indicates that no waveform is selected.
3	B	Package	Waveform package name for the waveform output from Memory B
0		Pattern	Waveform file name for the waveform output from Memory B
AW	AWGN	On	Indicates that the AWGN signal is on.
4	Level –207.00 dBm		Indicates the output level of the signal from Memory A.
F	Level Ratio	Level Ratio	Indicates the output level ratio of the signals from Memory A and Memory B.
5	–63 00 dBm	C/N Ratio	Indicates the output level ratio of the signal from Memory A or Memory B and AWGN signal.
6	Level –144 00 dBm		Indicates the output level of the signal from Memory B.
		А	Frequency image for the signal output from Memory A
7	Freq Offset	В	Frequency image for the signal output from Memory B
	1104 011000	CNT	Center Frequency displayed frequency
		Frequency	Offset frequency from Center Frequency
		N	AWGN signal
8	Start Offset 10/3 chip	Start Offset	Indicates the offset time for the play start timing of Memory A and B. Memory A is the reference, and offset is applied to the B side.
0	868 ns	10/3 chip	Display with System Unit of Memory B
		868 ns	Display of the time above

Table 7.3.1-1 ARB Info Dialog Box Display Contents

Table 7.3.1-1 AND This Dialog Box Display Contents (Cont u)			
No.	Display Example	Display	Description
9	¢		Indicates that the signal output from Memory A and the signal output from the waveform memory B are being combined.
10	Ð		Click to switch Hardware Block Chart and ARB Info display.

Table 7.3.1-1 ARB Info Dialog Box Display Contents (Cont'd)

Table 7.3.1-2	ARB/Waveform	Function Menu
		i unction menu

Page	Key No.	Menu Display	Function
1	F1	ARB Off <u>On</u>	Enables/disables the function to generate modulated signals with arbitrary waveform patterns.
	F2	Combination Mode Edit <u>Defined</u>	Sets the function mode to generate the pattern with Baseband. Refer to 7.3.2 "Pattern generation mode".
	F3	ARB Setup	Displays the ARB Setup function menu. Refer to 7.3.3 "ARB Setup".
	F4	Load	Displays the Waveform Load function menu to load the waveform pattern from HDD to the waveform memory. Refer to 7.3.4 "Loading waveform pattern: Load".
	F5	Select	Displays the Waveform Select function menu to select the waveform pattern to be output. Refer to 7.3.5 "Selecting output waveform pattern: Select".
	F6	Сору	Displays the Waveform Copy function menu to copy the waveform pattern from the external device to HDD. Refer to 7.3.6 "Copying external waveform pattern: Copy".
	F8	Restart	Restarts the waveform pattern being played. Both Pattern A and B are targeted.
2	F1	RF Gate	Displays the RF Gate function menu. Refer to 7.3.7 "RF Gate".
	F2	Start/Frame Trigger	Displays the Start/Frame Trigger function menu. Refer to 7.3.8 "Start/Frame Trigger".
	F3	Baseband Clock	Displays the Baseband Clock function menu. Refer to 7.3.11 "Baseband Clock".
	F4	Marker Setup	Displays the Marker Setup function menu. Refer to 7.3.12 "Marker Setup".
	F6	RMS Value Tuning 0.00 dB	Tunes the RMS value input to D/A of the IQ waveform data.
	F7	Sequence Mode	Displays the Sequence Mode function menu. Refer to 7.3.13 "Sequence Mode".
	F8	Sync Multi SG	Displays the Sync Multi SG function menu. Refer to 7.3.15 "Sync Multi SG".

ARB On/Off: ARB			
	Mode or Top>Mode Enables/disables the arbitrary waveform	e function to generate modulated signals with	
	In MG3740A, this can be used only when option-020/120 is installed.		
	Press F1 ARB of the	e ARB function menu for setting.	
	Off	Does not generate modulated signals with arbitrary waveform patterns.	
	On	Generates modulated signals with arbitrary waveform patterns. (Default)	
Remote command	Enable/disable the arbitrary waveform Command	function to generate modulated signals with patterns	
		RADio:ARB[:STATe] <boolean></boolean>	
	Query [:SOURce[1] 2]:	RADio:ARB[:STATe]?	
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	Generation of modulated signals with arbitrary waveform patterns On/Off	
	OFF 0	Does not generate modulated signals with arbitrary waveform patterns.	
	ON 1	Generates modulated signals with arbitrary waveform patterns (Default).	
	Programming Exan	nple	
	To set the generatio	n of modulated signals with arbitrary waveform	
	patterns to On.		
	RAD:ARB ON		

RAD:ARB ON RAD:ARB? > 1

Restart			
	Mode or Top>Mode	, >Restart	
	Restarts the waveform pattern being played.		
	Both Pattern A and B are targeted.		
	In MG3740A, this ca	in be used only when option-020/120 is installed.	
	Press F8 Restart on	the ARB function menu for execution.	
Remote command	Restart the wavefor Command	m pattern	
	[:SOURce[1] 2]:F	ADio:ARB:WAVeform:RESTart	
	Programming Exam	ple	
	To playback the wav RAD:ARB:WAV:REST	eform pattern from the beginning.	
RMS Value Tuning			
	Mode or Top>Mode	e, >⊖→>RMS Value Tuning	
	Tunes the IQ waveform data amplitude (RMS value) input to the D/A convertor of the internal arbitrary waveform generator.		
	This function is used for optimization of the output signal distortion or others.		
	In MG3740A, this can be used only when option-020/120 is installed.		
	Press F6 RMS Value menu for setting.	Tuning on page 2 of the ARB/Waveform function	
	Range	-8.00 dB to 8.00 dB	
	Resolution	0.01 dB	
	Default	0.00 dB	
Remote command	Tune the IQ Wavefor Command	rm data input amplitude	
	[:SOURce[1] 2]:F	ADio:ARB:RMSTuning <rel_ampl></rel_ampl>	
	Query		
	[:SOURce[1] 2]:F	ADio:ARB:RMSTuning?	
	Response		
	<rel_ampl></rel_ampl>	Unit: dB	

Parameter

<rel_ampl></rel_ampl>	IQ waveform data input amplitude
Range	–8.00 dB to 8.00 dB
Resolution	0.01 dB
Default	0.00 dB
Suffix code	DB, When omitted: DB

Programming Example

To tune the IQ Waveform data input amplitude to 1 dB. RAD:ARB:RMST 1.00 RAD:ARB:RMST? > 1.00

Operational explanation To avoid the DAC over-range:

Lower the RMS value with **RMS Value Tuning**. However, be careful about the dynamic range decrease.

To increase the dynamic range:

Raise the RMS value with $\ensuremath{\mathsf{RMS}}$ Value Tuning. However, be careful about the DAC over-range.

Note:

Even if the RMS value is changed with **RMS Value Tuning**, the output level is maintained; however, in some cases Unleveled is indicated. In this case, setting **RMS Value Tuning** to 0 dB allows avoiding Unleveled with this function.

7.3.2 Pattern generation mode: Combination Mode

		Combination Mode
	Sets the function mode	e to generate the pattern with Baseband.
	In MG3740A, this can	be used only when option-020/120 is installed.
	Press F2 Combination setting.	Mode on the ARB/Waveform function menu for
	Edit	Mode to generate modulated signals with the combination of arbitrary waveform patterns.
	Defined	Mode to generate modulated signals with the combination specified to the waveform file (Default).
Remote command	Select the function me	ode to generate the pattern with Baseband
	Command	
	[:SOURce[1] 2]:RA	Dio:ARB:PCOMbination EDIT DEFined
	Query	
	[:SOURce[1] 2]:RA	Dio:ARB:PCOMbination?
	Response	
	<mode></mode>	EDIT or DEF
	Parameter	
	<mode></mode>	The function mode to generate the pattern with Baseband.
	EDIT	Mode to generate modulated signals with the combination of arbitrary waveform patterns.
	DEFined	Mode to generate modulated signals with the combination specified to the waveform file (Default).

Programming Example

To set the function mode to generate the pattern with Baseband to the mode to generate modulated signals with the combination of arbitrary waveform patterns.

RAD:ARB:PCOM EDIT
RAD:ARB:PCOM?
> EDIT

To execute modulation with Defined mode

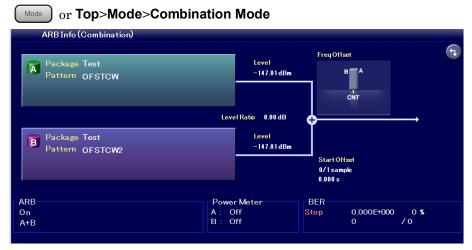


Figure 7.3.2-1 ARB Info (Combination) Dialog Box

With the Defined mode, the digital modulation setting screen display depends on the contents of the selected waveform file. However, the pattern is output according to the settings of the waveform file; therefore, basically the settings for output level ratio are not required. This mode is useful for simple evaluations such as the adjacent channel selectivity and sensitivity measurement in AWGN addition state.

In MG3740A, this can be used only when option 020/120 is installed.

The procedure is explained below.

Example: To select the waveform file and output the pattern in the Defined mode.

- 1. Press **F4 Load** to select the waveform file and load into the memory. Refer to 7.3.4 "Loading waveform pattern: Load".
- 2. Press F2 Combination Mode to set to "Defined".
- 3. Press **F5 Select** to select the waveform file loaded into the memory. Refer to 7.3.5 "Selecting output waveform pattern: Select".
- 4. Light the lamp (green) of Mad key to start the vector modulation.
- 5. When the output level, offset reference signal, frequency offset, and others of the pattern in each memory are changed, change the settings in the same way as 7.3.3 "ARB Setup".

To execute continuous operations in Defined mode.

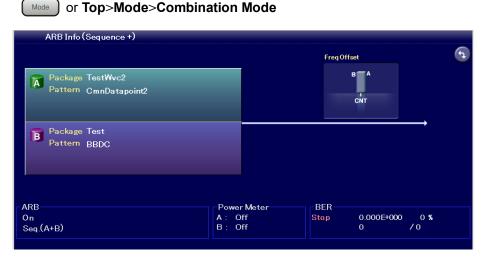


Figure 7.3.2-2 ARB Info (Sequence+) Dialog Box

Selecting the combination file with the definition of continuous operations in the Defined mode activates the sequence mode. The sequence mode allows the continuous operations where the waveform pattern and output level are switched automatically according to the definition of the combination file. Manual operations is also possible, instead of using the continuous operations. For details of the combination file for the sequence mode with the definition of the continuous operations, refer to the

MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).

In MG3740A, this can be used only when option 020/120 is installed.

The procedure is explained below.

Example: To execute the continuous operations in the sequence mode.

- 1. Select the combination file (for the sequence mode) to load into the memory. Refer to 7.3.4 "Loading waveform pattern: Load".
- 2. Press F2 Combination Mode to set to Defined.
- 3. Press **F5 Select** to select the waveform file loaded into the memory. Refer to 7.3.5 "Selecting output waveform pattern: Select".
- Light the lamp (green) of Med on Med function and the continuous operations simultaneously. Press F2
 Sequence Restart on the Sequence Mode function menu to restart the continuous operations from the beginning.

5. Press **F7 Sequence Mode** on page 2 of the ARB/Waveform function menu to display the **Sequence Progress** dialog box where the continuous operations state can be confirmed. The highlighted element indicates the pattern which is currently being output. The operations are repeated only for the number of times of Repeat where the one time is the data length of the waveform pattern of each element.

Setting **F3 Play Mode** to "Manual" on the Sequence Mode function menu switches the continuous operations to Manual. Then the operation is unlimitedly repeated for the highlighted element. Press **F1 Next Pattern** to move the operation to the next element.

Index	Package Name	Pattern Name	Repeat	Frequency Offset	Level	
1	GPS	DATA1c	1	0 Hz	0.00 dB	
2	GPS	DATA0	3	0 Hz	0.00 dB	
3	GPS	DATA1	1	0 Hz	0.00 dB	
4	GPS	DATA0	1	0 Hz	0.00 dB	
5	GPS	DATA1	2	0 Hz	0.00 dB	
3	GPS	DATA0	14	0 Hz	0.00 dB	
7	GPS	DATA1	2	0 Hz	0.00 dB	
3	GPS	DATA1	1	0 Hz	0.00 dB	
)	GPS	DATA0	2	0 Hz	0.00 dB	
0	GPS	DATA1	1	0 Hz	0.00 dB	
1	GPS	DATA0	2	0 Hz	0.00 dB	
						P.
otal :	23					
· cui ·	20					
RB-		Power	Meter	BER		
On .		A: 0	ff	Stop 0.000E+0	000 0 %	
		B: 0		0	/0	

Figure 7.3.2-3 Sequence Progress Dialog Box

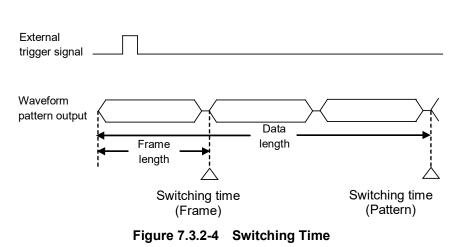
When Frequency or Level is changed during the sequence mode operation, Play Mode is changed to "Manual" and the sequence operation is stopped. To restart the sequence operation, set Play Mode to "Auto".

Sampling Rate A/B (Refer to 7.3.3 "ARB Setup") setting cannot be changed during the sequence operation. In addition, ATT Hold (Refer to 5.3.4 "ATT Hold") is always Off during the operation.

The displayed output level differs between On and Off of the vector modulation. The output level for each element and the maximum output level for all elements are displayed for On of the vector modulation and for Off of the vector modulation respectively.

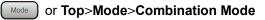
Setting **F1 Pattern Trigger** on the Pattern Trigger function menu (Refer to 7.3.14 "Pattern Trigger") to "On" and inputting the external trigger to Pattern Trigger on the back of MG3710A/MG3710E (Refer to 7.4.1 "Route Input Connectors") moves the operation to the next element.

Setting **F5 Switching Point** on the Pattern Trigger function menu to "Pattern" switches the base unit for the switching time for the next element with **F1 Next Pattern** or external triggers to the data length of the waveform pattern of each element. On the other hand, setting to



"Frame" switches the base unit to the frame length of the waveform of each element.

To output the pattern loaded into Memory A for modulation in Edit mode



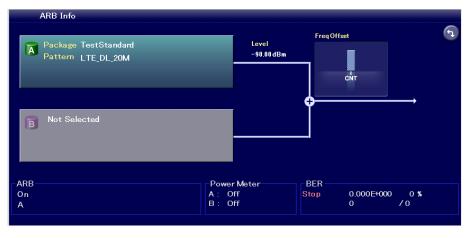


Figure 7.3.2-5 ARB Info Dialog Box

The pattern file is selected (the combination file cannot be selected) for modulation in the Edit mode. The pattern is selected for each memory for output. Here the pattern is output from Memory A.

In MG3740A, this can be used only when option-020/120 is installed.

The procedure is explained below.

- 1. Press **F4 Load** to select the waveform file and load into the memory. Refer to 7.3.4 "Loading waveform pattern: Load".
- 2. Press **F2 Combination Mode** on the ARB/Waveform function menu for setting to Edit.
- 3. Press **F5 Select** to select the waveform file loaded into the memory. Refer to 7.3.5 "Selecting output waveform pattern: Select".
- 4. Press **F3 ARB Setup** to display the ARB Setup function menu and set **F1 Output A** to On.
- 5. Press denote to light the lamp (green) of the key to start the vector modulation.

To combine outputs from Memory A and B for modulation in Edit mode

Mode or Top>Mode>ARB Setup

The output level, sampling rate, frequency offset, start offset, and spectrum reverse of Memory A and B can be set on the screen for combination of two patterns in the Edit mode. Using this function requires the Combination of Baseband Signal option (MG3710A/MG3710E/MG3740A-048/078/148/178).

In MG3740A, this can be used only when option-020/120 is installed.

Here, operations for the case where the two signals with same frequency are added for the desired wave and delay wave and for the case where the offset is added between the frequencies of two signals such as the adjacent channel selectivity are explained.

Output level

Specify the output level of the pattern. It can be specified for each of Memory A and B. Level $A\!/B$

In addition, the setting with the output level ratio of Memory A and B is available. **A/B Ratio**

The target for the level change on output level ratio change is changed with the setting of **A/B Signal Setting**. The displayed RF output level may be lower than the minimum output level of the MG3710A/MG3710E/MG3740A depending on the setting of the output level ratio; however, actually there is no output with the level lower than the minimum output level of the MG3710A/MG3710E/MG3740A.

Sampling rate

The sampling rates of the waveform signals of patterns of Memory A and B are set.

Sampling Rate A/B

Frequency offset

Freq Offset when Central Signal is "A"

The center frequency of Memory B is displaced based on the pattern of Memory A (0 Hz).

Freq Offset when Central Signal is "B"

The center frequency of Memory A is displaced based on the pattern of Memory B (0 Hz).

Freq Offset A/B when Central Signal is "Baseband DC"

The center frequencies of patterns of Memory A and B are displaced based on the Baseband center frequency.

Settings are executed with this function when there is an offset between frequencies of two signals such as the adjacent channel selectivity.

Start offset

Different play start timing is set for the patterns of Memory A and B. Memory A is the reference, and offset is applied to the B side. This function is enabled when the same pattern is output from Memory A and B and the correlation of both is to be decreased. **Start Offset**

Spectrum reverse

 $\ensuremath{\mathrm{I/Q}}$ of patterns of Memory A and B are swapped and the spectrum is reversed.

Spectrum A/B

Combination of signals with different sampling rates (Rate matching function) When a signal with a different sampling rate has been set to Memory A and Memory B, a combined signal which maintains each sampling rate is output. It is useful for purposes with the use of combined signals with different rates such as Multi Standard signals.

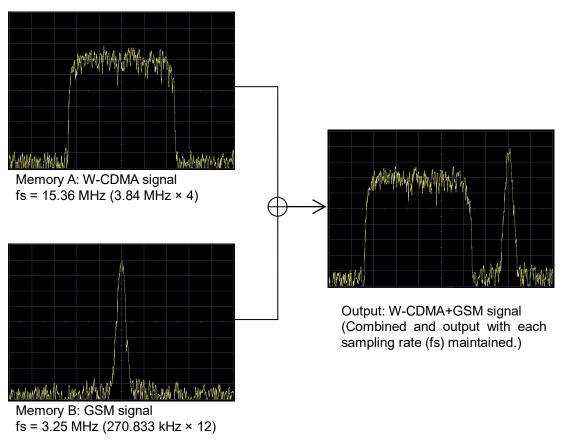


Figure 7.3.2-6 Rate Matching Function

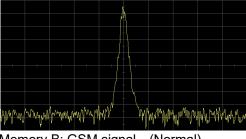
Some combinations of waveform sampling rates may disable rate matching due to internal operation clock limitation of the MG3710A/MG3710E/MG3740A. In this case, Rate Mismatch warning is displayed.

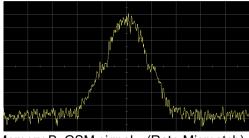


Figure 7.3.2-7 Rate Mismatch Display

Note:

When the Rate Mismatch is displayed, the sampling rate of Memory B side is changed to the frequency which is the same as the sampling rate of Memory A side. Therefore, the pattern of Memory B side operates with the sampling clock which differs from the pattern's clock, and is output in a bandwidth which differs from the normal status.



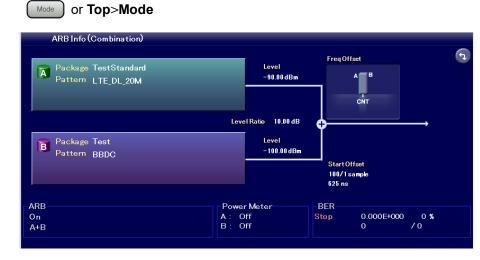


Memory B: GSM signal (Normal)

Memory B: GSM signal (Rate Mismatch)

Figure 7.3.2-8 Memory B Waveform of Rate Mismatch

When Rate Mismatch is displayed, the digital addition function (Rate Matching Function) does not work properly. Prepare a signal generator and add the signals externally.



To add two waves with same frequency in Edit mode

Figure 7.3.2-9 Two Waves Added Output

When the center frequencies of two patterns are to be set to the same value, set the frequency offset to 0 Hz. This function is useful when the transmission signal pattern of Memory A and the delay wave of Memory B are output for measurement of the performance of receiver.

In MG3740A, this can be used only when option 020/120 is installed.

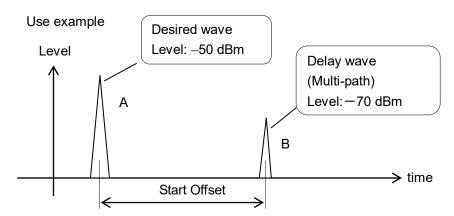
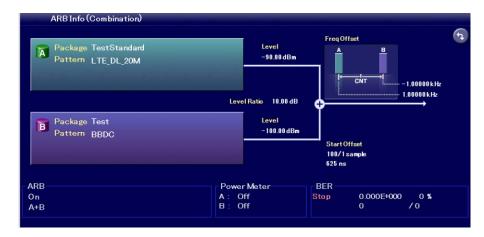


Figure 7.3.2-10 Example of Desired Wave and Delay Wave with Same Frequency

The procedure is explained below.

Example: To combine pattern files loaded into Memory A and B with the same frequency.

- 1. Press **F4 Load** to select the waveform file and load into the memory. Refer to 7.3.4 "Loading waveform pattern: Load".
- 2. Press **F2 Combination Mode** on the ARB function menu to set to Edit.
- 3. Press **F5 Select** to select the waveform file loaded into the memory. Refer to 7.3.5 "Selecting output waveform pattern: Select".
- 4. Press **F3 ARB Setup** to display the ARB Setup function menu and set **F1 Output A** and **F3 Output B** to On.
- 5. Set output levels with **F2 Level A** and **F4 Level B**. When the unit is changed, the unit of RF output level A and B are changed in tandem.
- Set the time offset of Pattern B based on Pattern A side with F5 Start Offset in Page 2.
- 7. Press on to light the lamp (green) of the key to start the vector modulation.



To give offsets to frequencies of two waves in Edit mode

Mode or Top>Mode>ARB Setup

Figure 7.3.2-11 Frequency Offset Output

When the center frequencies of two patterns are to be displaced, set the frequency offset to the arbitrary value. This function is useful when the transmission signal pattern of Memory A and the interference signal from the adjacent channel of Memory B are output for measurement of the performance of the receiver.

In MG3740A, this can be used only when option-020/120 is installed.

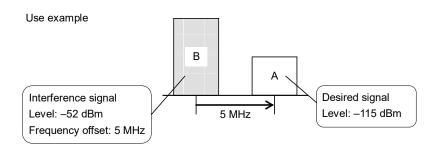


Figure 7.3.2-12 Example of Frequency Offset

The use example above is for Memory B as offset reference. It is also available that the offset reference is Memory A.

The procedure is explained below.

Example: To combine pattern files loaded into Memory A and B with the different frequency.

- Press F4 Load to select the waveform file and load into the memory. Refer to 7.3.4 "Loading waveform pattern: Load".
- 2. Press **F2 Combination Mode** on the ARB function menu to set to Edit.
- 3. Press **F5 Select** to select the waveform file loaded into the memory. Refer to 7.3.5 "Selecting output waveform pattern: Select".
- 4. Press **F3 ARB Setup** to display the ARB Setup function menu and set **F1 Output A** and **F3 Output B** to On.
- 5. Set output levels with **F2 Level A** and **F4 Level B**. When the unit is changed, the unit of RF output level A and B are changed in tandem.
- Next, set the frequency offset between A and B.
 Press F4 Center Signal on page 2 of ARB Setup function menu to set the pattern as the frequency reference to "B".
- 7. Press **F1 Freq Offset** on page 2 of ARB Setup function menu to display the **Freq Offset A** dialog box to set the offset frequency.
- 8. Press on to light the lamp (green) of the key to start the vector modulation.

Various settings for pattern output

(Mode) or Top>Mode

In MG3740A, this can be used only when option-020/120 is installed.

To re-output the pattern from the beginning.

Without the external trigger signal input, when the end of the waveform pattern is output, the pattern is automatically output from the beginning repeatedly. Press **F8 Restart** on the ARB function menu to allow re-output of the waveform pattern from the beginning with the arbitrary timing. However, pressing **F2 Sequence Restart** on the Sequence Mode function menu restarts the continuous operations from the first element in the sequence mode.

Switching I/Q signal source

To output the internal vector modulation signal with the waveform pattern, I/Q signal source must be set for the internal signal. Press **F2 I/Q** on page 2 of the top function menu to display the I/Q function menu, and press **F1 I/Q Source** to select "Internal".

When the modulated signal is the burst wave.

When the waveform pattern used is the burst wave, press **F4 RF Gate** on the ARB function menu, and press **F1 RF Gate** on the RF Gate function menu to set the RG Gate function to "On".

To output the pattern loaded into Memory B for modulation Previously in this document, the procedure to output the pattern loaded into Memory A for modulation has been explained. In addition, the pattern loaded into Memory B can be output for modulation. In the procedure for this case, not **F1 Output A** but **F3 Output B** is set to "On". In addition, when patterns are loaded into both of Memory A and B, set both of **F1 Output A** and **F3 Output B** to "On" to output from patterns included in the both memories.

7.3.3 ARB Setup

Mode or Top>Mode, >ARB Setup

Press **F3 ARB Setup** on the ARB function menu to open the ARB Setup function menu.

In MG3740A, this can be used only when option-020/120 is installed.

Page	Key No.	Menu Display	Function
1	F1	Output A	Enables/disables the Pattern A output.
		Off <u>On</u>	
	F2	Level A	Sets the Pattern A output level.
		-144.00 dBm	
	F3	Output B	Enables/disables the Pattern B output.
		<u>Off</u> On	
	F4	Level B	Sets the Pattern B output level.
		-144.00 dBm	
	F5	A/B Signal	Selects the target for level change on A/B Ratio change.
		Setting	(The option which is not selected is fixed.)
	Па	A B <u>A&B</u>	
	F6	A/B Ratio	Sets the level ratio of Pattern A and Pattern B.
	E7	0.00 dB	Orte the Dettern Area will an este
	F7	Sampling Rate A 20.000000 Hz	Sets the Pattern A sampling rate.
	F8	Sampling Rate B	Sets the Pattern B sampling rate.
	го	20.000000 Hz	Sets the rattern D sampling rate.
2	F1	Freq Offset 0 Hz	Sets the frequency offset between Pattern A and B. When CenterSignal is A or B, the frequency offset is set with this parameter.
	F2	Freq Offset A 0 Hz	Sets the frequency offset of Pattern A based on Baseband center frequency.
	F3	Freq Offset B 0 Hz	Sets the frequency offset of Pattern B based on Baseband center frequency.
	F4	Center Signal Baseband DC	Selects the pattern to be the reference on frequency display.
	F5	Start Offset 0	Sets the time offset of Pattern B based on Pattern A side.
	F6	Spectrum A <u>Normal</u> Reverse	Swaps I/Q of Pattern A and reverses the spectrum.
	F7	Spectrum B <u>Normal</u> Reverse	Swaps I/Q of Pattern B and reverses the spectrum.

 Table 7.3.3-1
 ARB Setup Function Menu

Output A/Output B

Mode or Top>Mode,>ARB Setup>Output A or Output B Enables/disables the Pattern A/B output.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Output A/F3 Output B** on the ARB Setup function menu for setting.

Off	Does not output I	Pattern A/B.
On	Outputs Pattern	A/B.
Default	Output A	On
	Output B	Off

Remote command Enable/disable the Pattern A/B output Command Command [:SOURce[1]|2]:RADio:ARB:WMA|WMB:OUTPut <boolean>

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:OUTPut?

Response

<boolean> 0 or 1

Parameter

<boolean></boolean>	Frequency relativ	ve display On/Off
OFF 0	Does not output Pattern A/B.	
ON 1	Outputs Pattern A/B.	
Default	Output A	On
	Output B	Off

Programming Example

To set Pattern B output to On. RAD:ARB:WMB:OUTP ON RAD:ARB:WMB:OUTP? > 1

Level A/Level B Mode or Top>Mode,>ARB Setup>Level A or Level B Sets the Pattern A/B output level. In MG3740A, this can be used only when option-020/120 is installed. Press F2 Level A/F4 Level B on the ARB Setup function menu for setting. Resolution 0.01 dB Default Minimum value of Output Level **Remote command** Set Pattern A/B output level Command [:SOURce[1]|2]:RADio:ARB:WMA|WMB:POWer <ampl> Query [:SOURce[1]|2]:RADio:ARB:WMA|WMB:POWer? Response <ampl> Unit: dBm Parameter <ampl> Pattern A/B output level Resolution 0.01 dB Suffix code DBM, DM, DBUV, DBUVE, When omitted: DBM **Programming Example** To set Pattern A output level to -30.00 dBm. RAD:ARB:WMA:POW -30.00 RAD:ARB:WMA:POW? > -30.00

A/B Signal Setting

Mode or Top>Mode,>ARB Setup>A/B Signal Setting

Selects the target for level change on A/B Ratio change (The option which is not selected is fixed).

In MG3740A, this can be used only when option-020/120 is installed.

Press F5 A/B Signal Setting on the ARB Setup function menu for setting.

А	Fixes Level B and changes Level A.
В	Fixes Level A and changes Level B.
A&B	Fixes OutputLevel and changes Level A and
	Level B. (Default)

Remote commandSelect the target for level change on A/B Ratio changeCommand

[:SOURce[1]|2]:RADio:ARB:POWer:RATio:TARGet A|B|AB

Query

[:SOURce[1]|2]:RADio:ARB:POWer:RATio:TARGet?

Response

<mode>

Parameter

<mode></mode>	Target for level change on A/B Ratio change
A	Fixes Level B and changes Level A.
В	Fixes Level A and changes Level B.
AB	Fixes OutputLevel and changes Level A and
	Level B. (Default)

Programming Example

To select Level B for the target for level change on A/B Ratio change. RAD:ARB:POW:RAT:TARG B RAD:ARB:POW:RAT:TARG? > B

A/B Ratio

Mode or Top>Mode, >ARB Setup>A/B Ratio

Sets the level ratio of Pattern A and Pattern B. A/B is indicated with dB.

In MG3740A, this can be used only when option-020/120 is installed.

Press F6 A/B Ratio on the ARB Setup function menu for setting.

Range	$-80~\mathrm{dB}$ to $80~\mathrm{dB}$
Resolution	0.01 dB
Default	0 dB

Remote command

Set the level ratio of Pattern A and Pattern B

Command

[:SOURce[1]|2]:RADio:ARB:POWer:RATio <rel_ampl>

Query

[:SOURce[1]|2]:RADio:ARB:POWer:RATio?

Response

<rel_ampl>

Unit: dB

Parameter

<rel_ampl> Range Resolution Default Suffix code Level ratio of Pattern A and Pattern B -80 dB to 80 dB 0.01 dB 0 dB DB, When omitted: DB

Programming Example

To set the level ratio of Pattern A and Pattern B to -30.00 dB. RAD:ARB:POW:RAT -30.00 RAD:ARB:POW:RAT? > -30.00

Sampling Rate A/Sampling Rate B

Mode or Top>Mode, >ARB Setup>Sampling Rate A or Sampling Rate B Sets the waveform signal sampling rate.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F7 Sampling Rate A/F8 Sampling Rate B** on the ARB Setup function menu for setting with the displayed dialog box.

Range	0.02 to 200 MHz $$	(MG3710A/MG3710E)
	0.02 to $8\ \mathrm{MHz}$	(MG3740A)
Resolution	$0.001 \ \mathrm{Hz}$	
Default	$20 \mathrm{~kHz}$	

Remote command Query the baseband signal sampling rate Command

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:SCLock:RATE <freq>

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:SCLock:RATE?

Response

<freq>

Unit: Hz

Parameter

<freq> Range

Resolution Default Suffix code Sampling rate 0.02 to 200 MHz (MG3710A/MG3710E) 0.02 to 8 MHz (MG3740A) 0.001 Hz 20 kHz HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ When omitted: HZ

Programming Example

To set SG1 waveform Memory A sampling rate. RAD:ARB:WMA:SCL:RATE 80MHZ RAD:ARB:WMA:SCL:RATE? > 80000000.000

Freq Offset

Mode] or Top>Mode,>ARB Setup>→>Freq Offset

Sets the frequency offset between Pattern A and B with this parameter, when CenterSignal is A or B.

The parameter is available only when the waveform is selected in Memory A and B and Output A and B are On at the same time. This is disabled when CenterSignal is Baseband DC.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Freq Offset** on page 2 of the ARB Setup function menu for setting.

Range	$-200~\mathrm{MHz}$ /2 to 200 MHz /2 (MG3710A/MG3710E)
	–8 MHz to 8 MHz (MG3740A)
Resolution	1 Hz
Default	0 Hz

Note:

If the output modulated wave exceeds the modulation bandwidth of the MG3710A/MG3710E/MG3740A, a missing signal/alias may occur. When the frequency offset is used, be careful that the bandwidth used does not to exceed the modulation bandwidth.

Remote command Set the frequency offset of Pattern A/Pattern B Command [:SOURce[1]|2]:RADio:ARB:FREQuency:OFFSet <freq>

Query

[:SOURce[1]|2]:RADio:ARB:FREQuency:OFFSet?

Response

<freq>

Unit: Hz

Parameter

<freq> Range

Resolution Default Suffix code Frequency - 200 MHz /2 to 200 MHz /2 (MG3710A/MG3710E) -8 MHz to 8 MHz (MG3740A) 1 Hz 0 Hz HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ When omitted: HZ

Details

When CenterSignal is A, the value is offset of B for A. When CenterSignal is B, the value is offset of A for B.

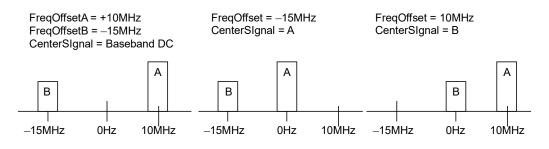


Figure 7.3.3-1 Example of Frequency Offset Setting

Programming Example

To set the SG1 frequency offset to 800 Hz. RAD:ARB:FREQ:OFFS 800 RAD:ARB:FREQ:OFFS? > 800

Freq Offset A/Freq Offset B

Mode or Top>Mode, >ARB Setup> >Freq Offset A or Freq Offset B Sets the frequency offset of Pattern A/Pattern B based on Baseband center frequency

In MG3740A, this can be used only when option-020/120 is installed.

Press **F2 Freq Offset A/F3 Freq Offset B** on page 2 of the ARB Setup function menu for setting.

Range	–200 MHz/2 to 200 MHz /2 (MG3710A/MG3710E)
	–8 MHz /2 to 8 MHz /2 (MG3740A)
Resolution	1 Hz
Default	0 Hz
Note:	

If the output modulated wave exceeds the modulation bandwidth of the MG3710A/MG3710E/MG3740A, a missing signal/alias may occur. When the frequency offset is used, be careful that the bandwidth used does not to exceed the modulation bandwidth.

Remote command Set the frequency offset of Pattern A/Pattern B

Command

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:FREQuency:OFFSet <freq>

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:FREQuency:OFFSet?

Response

<freq>

Unit: Hz

Parameter

<freq></freq>	Frequency
Range	–200 MHz/2 to 200 MHz /2 (MG3710A/MG3710E)
	–8 MHz /2 to 8 MHz /2 (MG3740A)
Resolution	1 Hz
Default	0 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	When omitted: HZ

Programming Example

To set the SG1 Pattern A frequency offset to 800 Hz. RADio:ARB:WMA:FREQ:OFFS 800 RADio:ARB:WMA:FREQ:OFFS? > 800

Center Signal

(Mode) or Top>Mode,>ARB Setup> >> Center Signal

Selects the pattern to be the reference on frequency display.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F4 Center Signal** on page 2 of ARB Setup function menu to open the Center Signal function menu for selection.

А	Pattern A is the reference.
В	Pattern B is the reference.
Baseband DC	DC position of Baseband is the reference
	(Default).

Note:

When the control language is set to MG3700A, B (Pattern B is the reference.) is a default. The default is effective after preset. For control languages, refer to "Selecting control language" in Section 9.4.1 "Interface Settings".

Remote command Select the pattern to be referenced on frequency display Command

[:SOURce[1]|2]:RADio:ARB:CSIGnal A|B|BDC

Query

[:SOURce[1]|2]:RADio:ARB:CSIGnal?

Response

<mode>

Parameter

<mode></mode>	Pattern for frequency display
A	Pattern A is the reference.
В	Pattern B is the reference.
BDC	DC position of Baseband is the reference
	(Default).

Programming Example

```
To set the pattern to be the reference on frequency display to Pattern A.
RAD:ARB:CSIG A
RAD:ARB:CSIG?
> A
```

Start Offset

Mode or Top>Mode, >ARB Setup> >> Start Offset

Sets the time offset of Pattern B based on Pattern A side.

The parameter is available only when the waveform is selected in Memory A and B and Output A and B are On at the same time.

In MG3740A, this can be used only when option-020/120 is installed.

Press F5 Start Offset on page 2 of ARB Setup function menu for setting.

Range	0 to the number of sampling data items of
	Pattern B – 1 or 9 999 999, whichever smaller
Resolution	1
Default	0
Unit	The number of samples with Sampling Rate B
	rate

Remote command Set the time offset Command [:SOURce[1]|2]:RADio:ARB:TIME:SOFFset <ext_integer>

Query

[:SOURce[1]|2]:RADio:ARB:TIME:SOFFset?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	Time offset value of Pattern B based on Pattern
	A side
Setting range	0 to the number of sampling data items of
	Pattern B – 1 or 9 999 999, whichever smaller
Resolution	1
Default	0
Unit	The number of samples with Sampling Rate B
	rate
Suffix code	None

Programming Example

To set the time offset of Pattern B based on Pattern A side to 800. RAD:ARB:TIME:SOFF 800 RAD:ARB:TIME:SOFF? > 800

Spectrum A/Spectrum B

	I/Q swap for Pattern A Spectrum A reverses th Spectrum B reverses th this, F2 RF Spectrum the spectrum of the wa	ARB Setup> > Spectrum A or Spectrum B is executed and the spectrum is revered. The spectrum of the waveform memory A, and the spectrum of the waveform memory B. Similar to of the Frequency function menu on page 2 inverts aveform memory A and B, respectively. Reversing etrum A or B simultaneously returns the status to	
	In MG3740A, this can be used only when option-020/120 is installed.		
	Press F6 Spectrum A/F menu for setting.	7 Spectrum B on page 2 of ARB Setup function	
	Normal	Does not reverse (Default).	
	Reverse	Reverses.	
Remote command	Set the spectrum reve	rse	
	Command		
	[:SOURce[1] 2]:RAI	Dio:ARB:WMA WMB:SPECtrum NORMal INVert	
	Query		
[:SOURce[1] 2]:RADio:ARB:WMA WMB:SPECtrum?		Dio:ARB:WMA WMB:SPECtrum?	
	Response		
	<mode></mode>	NORM or INV	
	Parameter		
	<mode></mode>	Spectrum reverse On/Off	
	NORMal	Does not reverse (Default).	

Programming Example

INVert

To set the spectrum reverse for Pattern A. RAD:ARB:WMA:SPEC INV RAD:ARB:WMA:SPEC? > INV

Inverts.

7.3.4 Loading waveform pattern: Load

Load or Top>Mode>Load

Loads the waveform pattern from HDD into the waveform memory.

In MG3740A, this can be used only when option-020/120 is installed.

Notes:

- To load the waveform pattern to the memory, the license file corresponding to each pattern must be installed. Refer to 9.4.4 "Install" for installation of the license file.
- Do not plug in and out the USB memory stick while loading a waveform pattern.

Press **Load** of the main function key or **F4 Load** on the ARB/Waveform function menu to open the **Waveform List to Load** dialog box and Waveform Load function menu.

•
4 patter

Figure 7.3.4-1 Waveform List to Load Dialog Box

No.	Display Example		Description
1	Drive C:	Drive number	
2	Pattern in Packages : Test	Name of packa	ge displaying pattern
3	Package Name	Package file na	ame
4	Pattern Name	Pattern file na	me
5	Туре	File type	
6	Status*	Status	File type
		Comment 1/2/3	Displays the Comment Lines 1/2/3
		Version	Version number
		Size	File size
		Sampling Rate	Sampling frequency
		RMS Value	RMS value
7	3.992 378 056 GByte Free	Remaining free Memory A or Memory B	
8	54 patterns	Number of patterns included in the selected package	

*: Displayed items switch according to Waveform Load function menu and Subitem Status.

Remote command

Query the waveform pattern file version on the hard disk Query

To query the version of the single pattern file (wvi/wvd). The version of the combination file (wvc) cannot be confirmed with this command.

:MMEMory:WAVeform:VERSion? <string1>,<string2>[,<device>]

```
:MMEMory:WAVeform:SINGle:VERSion?
<string1>,<string2>[,<device>]
```

Response

<version>

Parameter

<device></device>	Source drive number A to Z, currently selected
	drive when omitted
<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<version></version>	Version number: 00.00 to FF.FF in hexadecimal
	When patterns do not exist, $***$ is returned.

Details

This is a function only with remote commands.

Programming Example

To query the "TEST" pattern version number of the package "WCDMA" in C drive. MMEM:WAV:VERS? "WCDMA", "TEST" > 1.00

Remote command	Query the hard disk fro Query :MMEMory:FREE[:ALI	
	Response	
	<integer1>,<intege< th=""><th>er2> Unit: byte</th></intege<></integer1>	er2> Unit: byte
	Parameter	
	<device></device>	Source drive number A to Z, drive C when omitted
	<integer1></integer1>	Number of bytes in whole HDD
	<integer2></integer2>	Number of bytes of the remaining space -999.0 is returned when no devices exist.

Programming Example

To query the hard disk free space in C drive. MMEM:FREE? > 1234567890,123456789

	Table 7.3.4-2	Waveform Load Function Menu	I
--	---------------	-----------------------------	---

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Selects the device which includes the waveform pattern to be queried.
	F2	Focus Package <u>Pattern</u>	Moves the cursor between Package/Pattern frames.
	F3	Update Info	Updates the waveform pattern information in HDD.
	F4	Subitem Status	Switches the Subitem displayed items in Waveform List to Load dialog box.
	F5	Show Details	Displays details of the selected waveform pattern information in HDD.
	F6	Load Pattern	Loads the selected pattern in Waveform List to Load dialog box.
	F7	Load All Patterns	Loads all of the patterns in selected package in Waveform List to Load dialog box.
	F8	To Memory <u>A</u> B	Selects the waveform memory for the pattern to be loaded into.
2	F5	Delete pattern from selected drive	Deletes the selected waveform pattern.

Example: To load the waveform pattern into the waveform memory of MG3710A/MG3710E/MG3740A.

The explanation is provided below with the assumption that the Load Waveform function menu is displayed.

- 1. Press **F1 Drive** to select the device which includes the waveform pattern to be loaded.
- 2. Press **F8 To Memory** to select the waveform memory for the waveform pattern to be loaded.
- 3. The list of packages is displayed in the **Waveform List to Load** dialog box. Select Package with **F2 Focus**, and move the cursor on the package which includes the waveform pattern to be loaded with the direction key or rotary knob.
- 4. The list of waveform files of the selected package is displayed. Select Pattern with **F2 Focus**, and move the cursor on the waveform file to be loaded with the direction key or rotary knob.
- 5. Press **F6 Load Pattern** to load the waveform file specified in Step 4 into the waveform memory.

Notes:

- Displays of F6 and F7 are displayed when Pattern is selected with F2 Focus.
- Press **F7 Load All Patterns** to load all of the waveform files of Package selected in Step 3 regardless of the setting in Step 4.
- If an unreadable (grayed out) Pattern file is selected, **F6** becomes unavailable.
- 6. When loading of waveform patterns is finished, the residual memory display is changed corresponding to the total space of loaded waveform patterns.

4096 waveform files and 4096 packages can be loaded into the waveform memory. 4096 waveform files can be stored in one package.

Selecting device: Drive			
5	Load or Top>Mode>L	_oad, >Drive	
	Selects the device which	ch includes the waveform pattern to be loaded.	
	In MG3740A, this can be used only when option 020/120 is installed.		
	Press F1 Drive on the V Device function menu	Waveform Load function menu to display the for selection.	
	Options Default	All connected Drives C	
Moving cursor: Focus			
	Load or Top>Mode>I		
	Moves the cursor betw to Load dialog box.	een Package/Pattern frames in the Waveform List	
		he used only when ention 020/120 is installed	
		be used only when option-020/120 is installed.	
	Press F2 Focus on the	Waveform Load function menu for selection.	
	Package	Moves the cursor to Package List.	
	Pattern	Moves the cursor to Pattern List.	
Update Info			
• F	Load or Top>Mode>I	Load, >Update Info	
	Updates the waveform	pattern information in HDD.	
	In MG3740A, this can	be used only when option-020/120 is installed.	
	Press F3 Update Info $_{0}$	on the Waveform Load function menu for selection.	
Remote command	Update the waveform Command	pattern information in the HDD to enable loading	
	To update all the wavefor	orm pattern information.	
	:MMEMory:UPDate:WA	AVeform:ALL	
	To update the single pat	ttern file (wvi/wvd).	
	(If there is a wvc/wvi w	with the same name, both files are upload.)	
	:MMEMory:UPDate:WA	AVeform <string1>,<string2>[,<device>]</device></string2></string1>	

Parameter	
<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<device></device>	Source drive number A to Z, drive C when
	omitted

Programming Example

To update all the waveform pattern information. MMEM:UPD:WAV:ALL

To update the single pattern file "TEST" in the package "WCDMA" in drive D. MMEM:UPD:WAV "WCDMA", "TEST", D

Switching subitem: Subitem

Load or Top>Mode>Load,>Subitem

Selects the display items of Subitem in **Waveform List to Load** dialog box from the Subitem function menu.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F4 Subitem** on the Waveform Load function menu for selection.

Pattern type
Comment Line 1
Comment Line 2
Comment Line 3
Version number
File size
Sampling frequency
RMS value

Show Details

Load or Top>Mode>Load, >Show Details

Displays the details of the selected waveform pattern information in HDD.

In MG3740A, this can be used only when option-020/120 is installed.

Select Pattern in the **Waveform List to Load** dialog box and press **F5 Show Details** on the Waveform Load function menu to display the **Details of Waveform Data** dialog box.

Deta	ils of Waveform Data	
Pacakge	Test	
Pattern	CwSeq4	
[Comment Line 1 = E Line 2 = 4 Line 3 = Line 4 = Line 5 = Line 5 = Line 6 = Line 7 =	ilement:OFSTCW	
		~

Figure 7.3.4-2 Details of Waveform Data

Package	Package file name
Pattern	Pattern file name
[Comment]	
Line1 =	Comment
Line2 =	Comment
Line3 =	Comment
Line4 =	Comment
Line5 =	Comment
Line6 =	Comment
Line7 =	Comment

Load Pattern

Load or Top>Mode>Load, >Load Pattern

Loads the selected waveform pattern in HDD.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F6 Load Pattern** on the Waveform Load function menu for loading. This is displayed when Pattern is selected with **F2 Focus**. If an unreadable (grayed out) Pattern file is selected, **F6** becomes unavailable.

Remote command

Start loading the waveform pattern from the hard disk to the waveform memory

Command

:MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination <stringl>,<string2>[,<device>]

Query

:MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination? <string1>,<string2>[,<device>]

Response

<status>

Parameter

<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (`` $''$) or single quotes (' $'$)
<device></device>	Source drive number A to Z, currently selected
	drive when omitted
WMA	Wave Memory A
WMB	Wave Memory B
LONG	Long Pattern
COMBination	Combination Pattern
<status></status>	Status
0	Already loaded
1	Can be loaded
2	License required
3	No corresponding file
4	Insufficient waveform memory free space
5	Internal error
6	Version mismatch
7	Pattern file/combination file analysis error
8	Illegal pattern file/combination file (.wvi)
9	Exceeded number of loadable waveform pattern
	files/combination files
10	Exceeded number of loadable packages

	Details			
	If a waveform	n pattern is loaded when the same waveform pattern has		
	already been	loaded, the existing waveform pattern is overwritten.		
	Programming Example			
	To start loadi	ng "RMC15k" pattern file in package "WCDMA" in drive E		
	into the $\mathrm{SG2}$	waveform memory A.		
	MMEM2:LOAD	:WAV:WMA "WCDMA","RMC15k",E		
	*OPC?	// Loaded when 1 is returned		
	MMEM2:LOAD	:WAV:WMA? "WCDMA","RMC15k",E		
	> 0	// Already loaded		
Remote command	Confirm the loading status			
	Query			
	:MMEMory[1]] 2:LOAD:WAVeform:STATus?		
	Response			
	1	Being loaded.		
	0	Not being loaded.		
	Programming	g Example		
	To confirm SG2 loading status.			
	MMEM2:LOAD	:WAV:STAT?		
	> 1			
Remote command	Cancel the ar	ctive loading operation		
		stro logality operation		

Command :MMEMory[1]|2:LOAD:WAVeform:ABORt

Programming Example

To cancel SG2 loading. MMEM2:LOAD:WAV:ABOR

When the pattern file (long pattern data file) which is larger than the space of Memory A is loaded, both Memory A and B are used for loading. However, the long pattern data file can be loaded only in the Defined mode.

When selecting Long Pattern, the following Confirmation function menu is displayed. Since Long Pattern is an extremely large file, all the previously opened contents in Memory A and Memory B are erased. The selected pattern file is loaded into Memory A from the beginning, and the part which does not fit into Memory A is loaded into Memory B.

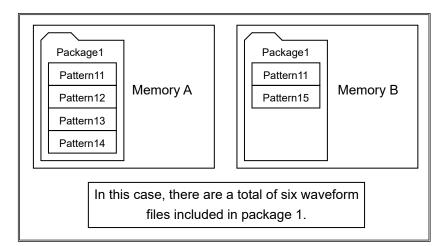
Page	Key No.	Menu Display	Function
1	$\mathbf{F7}$	Confirm overwriting All Loaded Pattern	Deletes contents of Memory A and Memory B and loads Long Pattern
	F8	Cancel	Returns to the menu before this menu is opened.

 Table 7.3.4-3
 Confirmation Function Menu

Select is executed by pressing F7 Confirm overwriting All Loaded Pattern.

Up to 4096 pattern files can be loaded into each Memory A and B. On the other hand, the number of combination files which can be loaded into the memory is 4096 at a maximum. Also, up to 4096 packages can be loaded into Memory A and B in total.

Up to 4096 waveform files can be stored in one package. If the same package exists in Memory A and B, the number of waveform files loaded into both memories are totaled. In that case, if the same pattern file is loaded into both Memory A and B, each pattern file in A and B are counted.



Load All Patterns

Load or Top>Mode>Load>,Load All Pattern

Loads all of the patterns in the selected package in **Waveform List to** Load dialog box.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F7 Load All Patterns** on the Waveform Load function menu for loading. This is displayed when Pattern is selected with **F2 Focus**.

Loading destination: To Memory

Image:
А	Waveform memory A (Default)
В	Waveform memory B

Delete

Load or Top>Mode>Load, $\rightarrow \rightarrow$ > Delete pattern from selected drive Deletes the selected waveform pattern.

In MG3740A, this can be used only when option-020/120 is installed.

Select the waveform pattern to be deleted in the **Waveform List to Load** dialog box and press **F5 Delete pattern from selected drive** on page 2 of Waveform Load function menu to display the Confirmation function menu and to highlight only the waveform pattern to be deleted. Press **F7 Confirm Deletion** on the Confirmation function menu to execute

Table 7.3.4-4	Confirmation	Function	Menu
1 abie 7.3.4-4	Communation	Function	wenu

the deletion.

Page	Key No.	Menu Display	Function	
1	$\mathbf{F7}$	Confirm Deletion	Deletes the waveform pattern.	
	F8	Cancel	Returns the menu before this menu is opened.	

Remote command

Delete the selected waveform pattern in HDD Command

To delete the combination file (wvc) or single pattern (wvi/wvd). If there is a wvc/wvi with the same name, the combination file has priority. :MMEMory:DELete:WAVeform[:NAME] <string1>,<string2>,[<device>]

To delete the single pattern file (wvi/wvd).

The combination file (wvc) cannot be deleted with this command. :MMEMory:DELete:WAVeform:SINGle[:NAME] <string1>,<string2>,[<device>]

Parameter

<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" ") or single quotes (' ')
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (" ") or single quotes (' ')
<device></device>	Source drive number A to Z, drive C when omitted

Details

This command does not delete waveform patterns in the waveform memory.

Programming Example

To delete the combination file "TESTALL" in the package "WCDMA" in drive D. MMEM:DEL:WAV "WCDMA", "TESTALL", D

To delete the single pattern file "TEST" in the package "WCDMA" in drive D. MMEM:DEL:WAV:SING "WCDMA", "TESTALL", D

7.3.5 Selecting output waveform pattern: Select

Select or Top>Mode>Select

Selects the waveform pattern to be output.

In MG3740A, this can be used only when option 020/120 is installed.

Press **Select** of the main function key or **F5 Select** on the ARB/Waveform function menu to display the **Waveform List to Play** dialog box and Waveform Select function menu.

Waveform List to Play				
Packages in Memory A - 1	Patterns in Package : Test – 2			
Package Name — 3 Test TestStandard TestWvc2	BBDC	wvi N wvi N	ormal ormal ormal ormal ormal	6 7 – 4 patterns

Figure 7.3.5-1 Waveform List to Play

7.3 Baseband Mode

No.	Display Example	Description			
1	in Memory A		Indicates the displayed memory when Combination Mode is Edit.		
2	Pattern in Packages : Test	Name of packa	Name of package displaying pattern		
3	Package Name	Package file na	ame		
4	Pattern Name	Pattern file na	me		
5	Туре	Indicates the memory type or comb (combination file) when Combination Mode is Edit. Indicates the file type when Combination Mode is Defined.			
6	Status*	StatusFile typeCommentDisplays the Comment1/2/3Lines 1/2/3			
		Version	Version number		
		Size File size			
		Sampling Rate	Sampling frequency		
		RMS Value	RMS value		
7	4 patterns	Number of pat package	terns included in the selected		

Table 7.3.5-1 Waveform List to Play

*: Displayed items switch according to Waveform Select function menu and Subitem Status.

Page	Key No.	Menu Display	Function
1	F2	Focus Package <u>Pattern</u>	Moves the cursor between Package/Pattern frames.
	F4	Subitem Status	Switches the Subitem displayed items in Waveform List to Play dialog box.
	F6	Select	Selects the waveform file to be output.
	F8	On Memory A B	Switches the Memory of the waveform pattern information to be displayed in Waveform List to Play dialog box.
2	F1	Delete	Deletes the selected package and pattern in the waveform memory.
	F2	Clear Memory	Deletes all patterns in the waveform memory.

Table 7.3.5-2 Waveform Select Function Menu

Example: To select the waveform file to be output from the waveform memory.

The explanation is provided below with the assumption that the Waveform Select function menu is displayed.

- The list of waveform patterns is displayed in the Waveform List to Play dialog box. Select Package with F2 Focus, and move the cursor on the package which includes the waveform file to be output with the direction key or rotary knob.
- The list of waveform files is displayed. Select Pattern with F2 Focus, move the cursor on the waveform file to be output with the direction key or rotary knob, and press F6 Select to select the waveform file to be output.

The waveform pattern can be output with addition of AWGN. For the AWGN function, refer to 7.5 "AWGN".

When "Preset" is done, the waveform file selection is released. However, the waveform pattern loaded into the waveform memory remains.

Example: To delete the waveform file from the waveform memory. The explanation is provided below with the assumption that the Waveform Select function menu is displayed. The list of waveform patterns is displayed in the Waveform List to 1. Play dialog box. Select Package with F2 Focus, and move the cursor on the package which includes the waveform file to be deleted with the direction key or rotary knob. The list of waveform files is displayed. Select Pattern with F2 Focus, 2.move the cursor on the waveform file to be deleted with the direction key or rotary knob, and press F1 Delete in the page 2 of Waveform Select function menu to delete the waveform file. Note: Press F2 Clear Memory to delete all waveform files in the waveform memory A and B. Even when the waveform file is deleted from the waveform memory, if the deleted waveform file remains in HDD, it can be loaded again. **Remote command** Query the waveform pattern name loaded into the waveform memory A/B Query :MEMory[1]|2:WAVeform:WMA|WMB|LONG|COMBination:NAME? <ext integer> Response <string1>,<string2> Parameter <ext integer> Random numbers allocated to waveform patterns. 0 to (Number of waveform patterns in the Range waveform memory -1) Resolution 1 <string1> Package name Character string within 31 characters enclosed by double quotes (" ") or single quotes (' ') <string2> Pattern name (excluding extensions) Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ')

	<pre>Programming Example To query the second waveform pattern name loaded in SG1 waveform memory A. MEM:WAV:WMA:NAME? 2 > "WCDMA", "TEST"</pre>			
Remote command	-	r of waveform patterns loaded in the waveform		
	memory			
	Query :MEMory[1] 2:W	AVeform:WMA WMB LONG COMBination:COUNt?		
	Response			
	<integer></integer>			
	Parameter			
	<integer></integer>	Number of waveform patterns loaded into waveform memory		
	Range	0 to 4096		
	Resolution	1		
	Programming Exa	imple		
	To query the numb memory A. MEM:WAV:WMA:CO > 2	ber of waveform pattern files loaded into SG1 waveform		
Remote command	-	rm memory free space		
	Query			
	For the waveform	-		
	:MEMory[1] 2:WAVeform:WMA:FREE?			
	For the waveform	memory B		
	:MEMory[1] 2:WAVeform:WMB:FREE? Response			
	<integer1>,<integer2>,<integer3></integer3></integer2></integer1>			
	Parameter			
	<integer1></integer1>	Free space (in byte)		
	<integer2></integer2>	Continuous free space (in byte)		
	<integer3> Total waveform memory size (in byte)</integer3>			

Programming Example

To query the SG1 waveform memory A free space. MEM:WAV:WMA:FREE? > 1234567890,12345678,123456789

Moving cursor: Focus

(Select) or Top>Mode>Select, >Focus

Moves the cursor between Package/Pattern frames in the **Waveform List** to **Play** dialog box.

In MG3740A, this can be used only when option-020/120 is installed.

 $\operatorname{Press} \textbf{F2}$ Focus on the Waveform Select function menu for selection.

Package	Moves the cursor to Package List.
Pattern	Moves the cursor to Pattern List.

Switching subitem: Subitem

(select) or Top>Mode>Select, >Subitem

Selects the display items of Subitem in **Waveform List to Play** dialog box from the Subitem function menu.

In MG3740A, this can be used only when option 020/120 is installed.

Press F4 Subitem on the Waveform Select function menu for selection.

Pattern type
Comment Line 1
Comment Line 2
Comment Line 3
Version number
File size
Sampling frequency
RMS value

Selecting waveform pattern: Select

(Select) or Top>Mode>Select, >Select

Selects the waveform pattern to be played from the waveform patterns loaded into the waveform memory.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F6 Select** on the Waveform Select function menu to select the waveform pattern to be played.

Remote command

Select the waveform file to be played from the waveform patterns in the waveform memory

Command

[:SOURce[1]|2]:RADio:ARB:WMA|WMB|LONG|COMBination:WAVefo
rm <string1>,<string2>

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB|LONG|COMBination:WAVefo
rm?

Response

<string1></string1>	"NONE" is returned when nothing is selected.
<string2></string2>	"NONE" is returned when nothing is selected.

Parameter

<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
WMA	Wave Memory A
	PatternCombination is automatically set to Edit.
WMB	Wave Memory B
	PatternCombination is automatically set to Edit.
LONG	Long Pattern
	PatternCombination is automatically set to
	Defined.
COMBination	Combination Pattern
	PatternCombination is automatically set to
	Defined.

Programming Example

To playback the combination file "RMC15k" in the package "WCDMA" on SG2. SOUR2:RAD:ARB:COMB:WAV "W-CDMA", "RMC15k" SOUR2:RAD:ARB:COMB:WAV? > "WCDMA", "RMC15k" SOUR2:RAD:ARB:LONG:WAV? > "NONE", "NONE"

Selecting waveform pattern: On Memory

(Select) or Top>Mode>Select, >On Memory

Switches the Memory of the waveform pattern information to be displayed in **Waveform List to Play** dialog box.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F8 On Memory** on the Waveform Select function menu to switch Memory A and B.

Note:

This is displayed when Combination Mode is set to Edit.

Delete

(Select) or Top>Mode>Select, >→>Delete

Deletes the specified waveform pattern in the waveform memory.

In MG3740A, this can be used only when option-020/120 is installed.

Select the waveform pattern to be deleted in the **Waveform List to Play** dialog box and press **F1 Delete** on page 2 of Waveform Select function menu to display the Confirmation function menu and to highlight only the waveform pattern to be deleted.

Press **F7 Confirm Delete** on the Confirmation function menu to execute the deletion.

Table 7.3.5-3	Confirmation	Function Menu
Table 7.3.5-3	Confirmation	Function Menu

Page	Key No.	Menu Display	Function
1	$\mathbf{F7}$	Confirm Deletion	Deletes the waveform pattern.
	F8	Cancel	Returns the menu before this menu is opened.

Remote command

Delete the specified package and waveform file in the waveform memory

Command

:MEMory[1]|2:DELete:WAVeform:WMA|WMB|LONG|COMBination:[: NAME] <string1>,<string2>

Parameter	
<string1></string1>	Package name
	Character string within 31 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)
<string2></string2>	Pattern name (excluding extensions)
	Character string within 100 characters enclosed
	by double quotes (" $"$) or single quotes (' $'$)

Details

This command does not delete waveform patterns on the hard disk.

Programming Example

To delete the pattern "TEST" in the package "WCDMA" in SG2 waveform memory A. MEM2:DEL:WAV:WMA "WCDMA", "TEST"

Clear Memory

Select or Top>Mode>Select, >→> Clear Memory

Deletes all patterns in the waveform memory. All patterns in both the waveform memory A and B are deleted.

In MG3740A, this can be used only when option-020/120 is installed.

Select the waveform pattern to be deleted in the **Waveform List to Play** dialog box and press **F2 Clear Memory** on page 2 of Waveform Select function menu to display the Confirmation function menu and to highlight only the waveform patterns to be deleted.

Press **F7 Confirm Delete** on the Confirmation function menu to execute the deletion.

Page	Key No.	Menu Display	Function
1	F7	Confirm Deletion	Deletes the waveform patterns.
	F8	Cancel	Returns the menu before this menu is opened.

Table 7.3.5-4	Confirmation	Function	Menu

Remote command

Delete all waveform patterns in the waveform memory Command

:MEMory[1]|2:DELete:WAVeform:ALL

Details

This command does not delete waveform patterns on the hard disk.

Programming Example

To delete all waveform patterns in SG2 waveform memory. MEM2:DEL:WAV:ALL

7.3.6 Copying external waveform pattern: Copy

Mode or Top>Mode,>Copy

Copies the waveform pattern of the external device such as USB memory to the internal HDD of MG3710A/MG3710E/MG3740A.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F6 Copy** on the ARB/Waveform function menu to open the **Waveform List to Copy** dialog box and Waveform Copy function menu.

Waveform List to Copy				
Packages Drive D:¥ 1	Patterns in Package : GPS			
Package Name - 🤈	Pattern Name _ 3 4 -	Type 5		
GPS	DATA0	wvi		
W-CDMA(BS Rx test)	DATA1	wvi		
W-CDMA_CMB	DATA10	wvi		
	DATA1c	wvi		
	PARITY	wvi		
	PN9	wvi		
	SYNC_ADJ	wvc		
	7	6 – 7 patterns		

Figure 7.3.6-1 Waveform List to Copy Dialog Box

Table 7.3.6-1	Waveform	List to Copy
---------------	----------	--------------

No.	Display Example	Description
1	Drive C:	Drive number
2	Package Name	Package file name
3	Pattern Name	Pattern file name
4	Туре	File type
5	Path	Location where pattern file saved
6	54 patterns	Number of patterns included in the selected package

Page	Key No.	Menu Display	Function
1	F1	Drive C	Selects the copy source device for the waveform pattern.
	F2	Focus <u>Package</u> Pattern	Moves the cursor between Package/Pattern frames.
	F6	Copy Pattern/Package	Copies the selected waveform pattern to HDD.
	$\mathbf{F7}$	Copy All Patterns/Packages	Copies all waveform files/packages to HDD.
	F8	To Drive C:	Sets the copy destination drive for the waveform file.

Table 7.3.6-2 Waveform Copy Function Menu

Example: To copy the waveform pattern of the external device such as USB memory to the specified drive.

The explanation is provided below with the assumption that the Waveform Copy function menu is displayed.

- 1. Press **F1 Drive** to select the device which includes the waveform pattern to be copied.
- The list of waveform patterns is displayed in the Waveform List to Copy dialog box. Select Package with F2 Focus, and move the cursor on the waveform pattern to be copied with the direction key or rotary knob.
- 3. The list of waveform files of the selected package is displayed. Select Pattern with **F2 Focus**, and move the cursor on the waveform file to be copied with the direction key or rotary knob.
- 4 Press **F6 Copy Pattern** to copy the waveform file specified in Step 3 into the copy destination device.

Notes:

- Even when only the combination file is copied to the internal hard disk, if the pattern file specified with the combination file does not exist in the internal hard disk, the combination file cannot be loaded into the memory.
- When copying waveform file, copy the waveform file to the root directory of the target device, or make a sub-directory that bears the name of the package. See the example below.
 - Example: Preparing waveform file ("test.wvi" or "test.wvd" package name being "ABC") to be copied into the F drive. Copy the file into the following directory you are going to create, so that it will be: F:\test.wvi, F:\test.wvd

or F:\ABC\test.wvi, F:\ABC\test.wvd

• Do not turn off the power while the waveform file is being copied.

Copy source drive: Drive

Mode or Top>Mode,>Copy>Drive

Selects the copy source drive for the waveform pattern.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Drive** on the Waveform Copy function menu to display the Drive function menu for selection.

Options	All connected Drives
Default	С

Moving cursor: Focus

(Mode) or Top>Mode,>Copy>Focus

Moves the cursor between Package/Pattern frames in the **Waveform List** to **Copy** dialog box.

In MG3740A, this can be used only when option-020/120 is installed.

 $\operatorname{Press} \textbf{F2}$ Focus on the Waveform Copy function menu for selection.

Package	Moves the cursor to Package List.
Pattern	Moves the cursor to Pattern List.

Switching subitem: Subitem

Mode or Top>Mode,>Copy>Subitem

Selects the display items of Subitem in **Waveform List to Copy** dialog box from the Subitem function menu.

In MG3740A, this can be used only when option-020/120 is installed.

Press F4 Subitem on the Waveform Copy function menu for selection.

Pattern type
Comment Line 1
Comment Line 2
Comment Line 3
Version number
File size
Sampling frequency
RMS value

Copy Pattern/Copy Package

p) : a	Mode or Top>Mo	de, >Copy>Copy Pattern/Copy Package d waveform pattern of the specified drive to HDD.		
	-	can be used only when option-020/120 is installed.		
		ttern/Copy Package on the Waveform Copy function		
		elected with F2 Focus , Copy Pattern is executed, and selected, Copy Package is executed.		
Remote command	Copies the select Command	ed waveform pattern of the specified drive to HDD.		
		To copy all waveform patterns in the specified folder.		
	:MMEMory:COPY:			
	<device1>[,<st< th=""><th>ring> ROOT[,<device2>]]</device2></th></st<></device1>	ring> ROOT[, <device2>]]</device2>		
	If there is a wvc/w priority. :MMEMory:COPY: <device1>,<str To copy the single</str </device1>	ring> ROOT, <string1>[,<device2>] pattern file (wvi/wvd).</device2></string1>		
	The combination file (wvc) cannot be copied with this command. :MMEMory:COPY:WAVeform:SINGle			
		ring> ROOT, <string1>[,<device2>]</device2></string1>		
	Parameter			
	<device1></device1>	Copy source drive A to Z, drive C when omitted		
	<device2></device2>	Copy destination drive A to Z, drive C when omitted		
	<string></string>	Package name When omitted: all packages Character string within 31 characters enclosed by double quotes ("") or single quotes ('')		
	ROOT	Root folder All packages when omitted.		
	<string1></string1>	Pattern name (excluding extensions) Character string within 100 characters enclosed by double quotes ("") or single quotes ('')		

Programming Example

To copy all waveform patterns included in the package "WCDMA" in E drive to D drive. MMEM:COPY:WAV:ALL E, "WCDMA", D

To copy the waveform file "TEST" included in the root folder in E drive to D drive. MMEM:COPY:WAV E, "ROOT", "TEST", D

To copy the single pattern file "TEST" included in the package "WCDMA" in E drive to C drive. MMEM:COPY:WAV:SING E, "WCDMA", "TEST"

Copy All Patterns/Copy All Packages

Mode or Top>Mode,>Copy>Copy All Patterns/Copy All Packages Copies all waveform files/packages to HDD.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F7 Copy All Patterns/Copy All Packages** on the Waveform Copy function menu for copy. The progress bar and Progress function menu are displayed during execution.

When "Pattern" is selected with **F2 Focus**, Copy All Patterns is executed, and when "Package" is selected, Copy All Packages is executed.

Example: To copy the waveform files to HDD.

The explanation is provided below with the assumption that the Waveform Copy function menu is displayed.

- 1. Press **F1 Drive** to select the device which includes the waveform pattern to be copied.
- 2. The list of waveform patterns is displayed in the **Waveform List to Copy** dialog box. Select Package with **F2 Focus**, and move the cursor on the package which includes the waveform patterns to be copied with the direction key or rotary knob.
- The list of waveform files of the selected package is displayed. Select Pattern with F2 Focus, and move the cursor on the waveform file to be copied with the direction key or rotary knob.
- 4 Press **F7 Copy All Patterns** on the Waveform Copy function menu to copy the waveform patterns.

Note:

Press **F7 Delete All** on the Waveform Copy function menu to delete all waveform patterns according to the setting with **F2 Focus** regardless of settings in Step 2 and 3.

- 5. The progress bar window is displayed during copying of pattern files.
- 6. When copying waveform patterns is finished, the progress bar window is closed.

Notes:

- When the deleted pattern file has been specified with the combination file, the combination file cannot be loaded into the memory any more.
- Do not turn off the power while the waveform pattern is being deleted.
- When the package is deleted, all waveform files included in the package are deleted.
- Note that the waveform pattern deleted from the internal hard disk cannot be recovered.

Setting copy destination drive: To Drive

Mode or Top>Mode, >Copy>To Drive

Sets the copy destination drive for the waveform file.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F8 To Drive** on the Waveform Copy function menu for setting.

7.3.7 RF Gate

Mode or Top>Mode, >→>RF Gate

Controls the RF output On/Off for the modulated wave to execute the pulse modulation. This function is used for the pulse modulation for the RF output when the burst signal such as TDMA is used. The RF On/Off control can be executed with the pulse modulation control bit (when Edit Mode = Off) added to the waveform pattern or user-specified interval/width (when Edit Mode = On/Sync).

In MG3740A, this can be used only when option 020/120 is installed.

Press **F1 RF Gate** on page 2 of ARB/Waveform function menu to open the RF Gate function menu.

Page	Key No.	Menu Display	Function
1	F1	RF Gate	Enables/disables the RF Gate function.
		Off <u>On</u>	
	F2	Edit Mode	Sets the RF Gate edit function.
		<u>Off</u> On Sync	
	F3	Туре	Sets the number of RF Gate lines to be edited.
		Single Double	
	F4	Offset 1	Sets Offset from the top output of Pattern to RF Gate1.
		0.00	
	F5	Width 1	Sets the RF Gate1 width.
		1.00	
	F6	Offset 2	Sets Offset for the RF Gate2 timing after Pattern top
		0.00	output.
	F7	Width 2	Sets the RF Gate2 width.
		1.00	
	F8	Cycle	Sets the cycle for RF Gate1 and RF Gate2. The cycle
		1.00	for RF Gate1 and RF Gate2 is common.

Table 7.3.7-1 RF Gate Function Menu

RF Gate	— — — — — — — — — — — — — — — — — — —		
	Mode or Top>Mode,>→>RF Gate>RF Gate Enables/disables the RF Gate function.		
	In MG3740A, this can be used only when option-020/120 is installed. Press F1 RF Gate on the RF Gate function menu to set On/Off.		
	Off On	RF Gate is not used. Constant output. RF output On/Off control is executed with RF Gate (Default).	
Remote command	Enable/disable the RF Gate function		
	Command [:SOURce[1] 2]:RAD	io:ARB:RFGate <boolean></boolean>	
	0		
	Query [:SOURce[1] 2]:RADio:ARB:RFGate?		
	[[.].		
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	RF Gate function On/Off	
	OFF 0	RF Gate is not used. Constant output.	
	ON 1	RF output On/Off control is executed with RF Gate (Default).	
	Programming Example		
	To set the RF Gate fund	etion to On.	
	RAD:ARB:RFG ON RAD:ARB:RFG?		
	> 1		
Editing RF Gate: Edit Mod			
		→>RF Gate>Edit Mode	
	Enables/disables the RI		
	In MG3740A, this can b	be used only when option-020/120 is installed.	
	Press F2 Edit Mode on	the RF Gate function menu to set On/Off.	
	Off	RF Gate bit in Pattern is used. When both Pattern A and B have been selected,	
	On	the RF Gate bit in Pattern A is used (Default). RF Gate is edited. RF Gate frequency is set by	

the user. RF Gate bit in Pattern is disabled.

	waveform data bit ler	RF Gate is edited. RF Gate cycle synchronizes with the Pattern cycle. RF Gate bit in Pattern is disabled. 10E/MG3740A allows handling up to 16 bits of ngth. In this case, the RF Gate signal cannot be eform data; therefore, this function is used for	
	If the RF Gate bit is not added to the waveform pattern, even setting the Edit Mode to Off does not allow the RF output On/Off control. The RF Gate bit can be added when the waveform pattern bit width is 14 or 15 bits.		
	For the method to add the bit to the waveform pattern, refer to the <i>MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A</i> Analog Signal Generator Operation Manual (IQproducer TM).		
Remote command	Enable/disable the RF Gate function Command [:SOURce[1] 2]:RADio:ARB:PULSe:EDIT[:STATe] ON OFF PATSync Query [:SOURce[1] 2]:RADio:ARB:PULSe:EDIT[:STATe]?		
	Response <mode></mode>	ON, OFF or PATS	
	Parameter		
	<mode></mode>	RF Gate edit function On/Off	
	OFF	RF Gate bit in Pattern is used. When both Pattern A and B have been selected, the RF Gate bit in Pattern A is used (Default).	
	ON	RF Gate is edited. RF Gate frequency is set by the user. RF Gate bit in Pattern is disabled.	
	PATSync	RF Gate is edited. RF Gate cycle synchronizes with the Pattern cycle. RF Gate bit in Pattern is disabled.	
	Programming Examp To set the RF Gate ed RAD: ARB: PULS: EDI	lit function to On (the cycle is set by the user).	

RAD:ARB:PULS:EDIT?

IAD.AID.IO15.EDII

RF Gate line: Type			
	 Mode or Top>Mode, > > > RF Gate>Type Selects the number of RF Gate lines to be edited. In MG3740A, this can be used only when option-020/120 is installed. Press F3 Type on the RF Gate function menu for selection. 		
	Single	The output signal is gated with one RF Gate (Default). Set RF Gate 1 with F4 , F5 , and F8 .	
	Double	The output signal is gated with combined (OR) two RF Gate lines. Set two RF Gate 1/2 with F4 to F8 .	
Remote command	Set the number of RF Gate lines to be edited Command [:SOURce[1] 2]:RADio:ARB:PULSe:TYPE SINGle DOUBle		
	Query		
	[:SOURce[1] 2]:R	ADio:ARB:PULSe:TYPE?	
	Response		
	<mode></mode>	SING or DOUB	
	Parameter		
	<mode></mode>	RF Gate edit function On/Off	
	SINGle	The output signal is gated with one RF Gate	
		(Default).	
	DOUBle	The output signal is gated with combined (OR) two RF Gate lines.	
	Programming Exam	ole	
	To set the number of RF Gate lines to be edited to two lines. RAD:ARB:PULS:TYPE DOUB		

RAD:ARB:PULS:TYPE?
> DOUB

RF Gate offset 1/2: Offset 1/ Offset 2

Mode or Top>Mode,>>>>RF Gate>Offset 1/Offset 2

Sets the offset from the top output of Pattern to RF Gate1/2.

In MG3740A, this can be used only when option-020/120 is installed.

Press F4 Offset 1/F6 Offset 2 on the RF Gate function menu for setting.

Range	Lower limit	0
	Upper limit	$(2^24 - 1)$ ÷ OverSampling
		A/B
Resolution	0.01	
Default	0	
Unit	SystemUnit A/B	
OverSampling A/B	Over sampling magnification ratio of the	
	waveform data A	/B

Note:

The following are applied:

For Pattern A output: OverSampling A and SystemUnit A.

For Pattern B output: OverSampling B and SystemUnit B.

For Pattern A/B simultaneous output: OverSampling A and SystemUnit A.

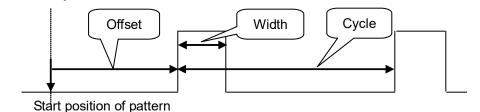


Figure 7.3.7-1 RF Gate Offset, Width, and Cycle

Remote command

Set the offset from the top output of Pattern to RF Gate1/2 Command

[:SOURce[1]|2]:RADio:ARB:PULSe[1]|2:EDIT:OFFSet
<ext numeric>

Query

[:SOURce[1]|2]:RADio:ARB:PULSe[1]|2:EDIT:OFFSet?

Response

<ext_numeric>

Parameter		
<ext_numeric></ext_numeric>	Offset value from the top output of Pattern to RF	
	Gate1/2	
Range	Lower limit	0
	Upper limit	$(2^24 - 1) \div \text{OverSampling}$
		A/B
Resolution	0.01	
Default	0	
Unit	SystemUnit A/B	
Suffix code	None	

Details

As for node : PULSe [1] | 2, select RF Gate 1 or RF Gate 2. Set as follows:

RF Gate 1: : PULSe1 or : PULSe

RF Gate 2: :PULSe2

Programming Example

To set the RF Gate2 offset to 1. RAD:ARB:PULS2:EDIT:OFFS 1 RAD:ARB:PULS2:EDIT:OFFS? > 1.00

RF Gate width 1/2: Width 1/Width 2

Mode or Top>Mode,>>>RF Gate>Width 1/Width 2

Sets the RF Gate1/2 width.

In MG3740A, this can be used only when option-020/120 is installed.

 ${\rm Press}~F5$ Width 1/F7 Width 2 on the RF Gate function menu for setting.

Setting range	
Minimum value	1 ÷ OverSampling A/B
Maximum value	When RF Gate Edit Mode1/2 is set to "On",
	$(2^24 - 1) \div \text{OverSampling A/B}$
	(Rounded off to two decimal places)
	or RF Gate Cycle, whichever smaller
	When RF Gate Edit Mode1/2 is set to "Sync",
	$(2^{24}-1) \div OverSampling A/B$
	(Rounded off to two decimal places)
	or DataPointA/B ÷ OverSampling A/B,
	whichever smaller
Resolution	0.01 [SystemUnit A/B]
Default	1
Unit	SystemUnit A/B
OverSampling A/B	Over sampling magnification ratio of the
	waveform data A/B

	SystemUnit A/B	Data unit for each system (Symbol, Bit, Chip, and others)
	DataPointA/B	Waveform pattern cycle
	<i>Note:</i> The following are a When Pattern A is When Pattern B is When both A/B is	output, OverSampling A, SystemUnit A. output, OverSampling B, SystemUnit B.
Remote command	Set the RF Gate1/2 widtl	1
	Command [:SOURce[1][2]:RADi	o:ARB:PULSe[1] 2:EDIT:WIDTh
	<ext_numeric></ext_numeric>	
	Query	
	[:SOURce[1] 2]:RADi	o:ARB:PULSe[1] 2:EDIT:WIDTh?
	Response	
	<ext_numeric></ext_numeric>	
	Parameter	
	—	RF Gate1/2 width
	Setting range, resolution	
		Refer to the above explanation.
		SystemUnit A/B None
	Details	2, select RF Gate 1 or RF Gate 2. Set as follows:
	RF Gate 1: : PULSe1 or :	
	RF Gate 2: : PULSe2	
	Programming Example To set the RF Gate1 widt RAD:ARB:PULS:EDIT:W RAD:ARB:PULS:EDIT:W	IDT 1
	> 1.00	

RF Gate cycle: Cycle

Mode or Top>Mode,>>>>RF Gate>Cycle

Sets the cycle for RF Gate1 and RF Gate2. The cycle for RF Gate1 and RF Gate2 is common.

In MG3740A, this can be used only when option 020/120 is installed.

Press F8 Cycle on the RF Gate function menu for setting.

Range	
Lower limit	1 ÷ OverSampling A/B
Upper limit	$(2^24 - 1) \div \text{OverSampling A/B}$
	(Rounded off to two decimal places)
Resolution	0.01
Default	1
Unit	SystemUnit A/B
OverSampling A/B	Over sampling magnification ratio of the
	waveform data A/B
SystemUnit A/B	Data unit for each system (Symbol, Bit, Chip,
	and others)

Note:

The following are applied:	
When Pattern A is output,	OverSampling A, SystemUnit A.
When Pattern B is output,	OverSampling B, SystemUnit B.
When both A/B is output,	OverSampling A, SystemUnit A.

Remote command

Set the cycle for RF Gate1 and RF Gate2 Command

[:SOURce[1]|2]:RADio:ARB:PULSe:EDIT:CYCLe <ext_numeric>

Query

[:SOURce[1]|2]:RADio:ARB:PULSe:EDIT:CYCLe?

.. .

Response

<ext_numeric>

Parameter

<ext_numeric> Range Cycle for RF Gate1 and RF Gate2 1 ÷ OverSampling A/B to (2^24 – 1) ÷ OverSampling A/B

Resolution0.01Default1UnitSystemSuffix codeNone

1 SystemUnit A/B None

Programming Example

To set the cycle for RF Gate1 and RF Gate2 to 1. RAD:ARB:PULS:EDIT:CYCL 1 RAD:ARB:PULS:EDIT:CYCL? > 1.00

7.3.8 Start/Frame Trigger

(Mode) or Top>Mode,>→>Start/Frame Trigger

Sets the settings related to Start/Frame Trigger.

This is used to interlock the waveform pattern play operation with the external trigger input.

Press **F2 Start/Frame Trigger** on the ARB/Waveform function menu to open the Start/Frame Trigger function menu.

Page	Key No.	Menu Display	Function
1	F1	Start/Frame Trigger <u>Off</u> On	Enables/disables the trigger to be used for Baseband signal output start. In MG3740A, this can be selected only when option-020/120 is installed.
	F2	Mode <u>Start</u> Frame	Selects the mode for the trigger to be used for Baseband signal output start. In MG3740A, this can be selected only when option-020/120 is installed.
	F3	Source Ext	Selects Start/Frame Trigger Source. In MG3740A, this can be selected only when option-020/120 is installed.
	F4	Delay 0.00	Sets the delay time from the Trigger input to RF signal output. In MG3740A, this can be selected only when option-020/120 is installed.
	F5	Edge <u>Rise</u> Fall	Sets the detection edge of Start/Frame trigger input. In MG3740A, this can be selected only when option-020/120 is installed.
	F6	Event Buffered Trig	Sets the trigger operation when Frame trigger is used. In MG3740A, this can be selected only when option-020/120 is installed. Refer to 7.3.9 "Setting Frame trigger operation: Event".
	F7	Frame Count 1 Frame	Sets the number of frames to output when Frame trigger operation is executed. In MG3740A, this can be selected only when option-020/120 is installed. Refer to 7.3.10 "Frame Count"
	F8	Trigger Key	Generates Start/Frame Trigger manually. This is executable only from this menu. When SFTriggerSource is Trigger Key, executing this function applies the trigger.

Table 7.3.8-1 Start/Frame Trigger Function Menu

Start/Frame Trigger

Mode or Top>Mode, >→>Start/Frame Trigger>Start/Frame Trigger
Enables/disables the trigger to be used for Baseband signal output start.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Start/Frame Trigger** on the Start/Frame Trigger function menu for setting.

Off	Does not use the trigger (Default).
On	Uses the trigger.

To output the signal in synchronization with the external trigger signal. MG3710A/MG3710E/MG3740A allows output waveform patterns in synchronization with the trigger signal input from the external. The external trigger signal can be selected from the two types of Start Trigger to specify the waveform pattern output start position and Frame Trigger to specify the output timing for each burst when the burst signal is selected.

Also in the sequence mode, using Pattern Trigger allows specifying the element switching timing.

Start Trigger operation

In Start Trigger operation, after the waveform pattern is selected, output is started according to the rising timing of the first external trigger signal and continued. The second and later input external trigger signals are invalid. The relation between the external trigger signal and waveform pattern output can be set with Delay. When Delay is set to "0", the waveform pattern is output 1 Frame (*) cycle behind which is determined with the waveform pattern after the external trigger signal rising.

*: 1 Frame cycle means values below.

 When the waveform pattern is generated with the use of Convert function of IQproducer[™]

The number of samples of 1 Frame is set with the settings of Burst Setting Frame Length (L_f) and Gap Length (L_g). 1 Frame cycle is $L_f + L_g$ which means the number of samples between 1 Frames.

Example: When the over sampling data of four times of W-CDMA is converted:

Frame Length = 3.84×10^{6} [sample/s] × 0.01 [s] ×4 [Over sampling ratio] = 153600

For details, refer to 4.5.3 "Editing Convert data" in the MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducerTM).

(2) When the waveform pattern is generated with the application to generate the signal which is the option of IQproducerTM

The frame length supporting each communications system is set automatically. In this case, the values of L_f and L_g change depending on whether the system used is for continuous waves or burst waves as follows:

• For continuous waves

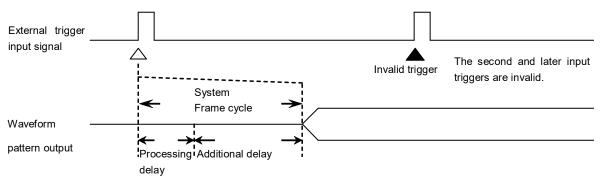
 $L_{\rm f}{=}$ The number of samples for 1 Frame of the system is set. $L_{\rm g}{=}$ 0 is set.

• For burst waves

 L_f = The number of samples for 1 Slot or 1 Frame of the system is set.

 L_g = "The number of samples for 1 Frame" – "The number of samples for 1 Slot" or 0 is set.

The details for the above depend on systems; however, $L_f + L_g$ is the number of samples for 1 Frame determined with systems in each case.



- * When Delay is set to 0, the waveform pattern is output Frame cycle and processing delay generated from trigger waveform pattern generation with internal delay (additional delay) behind.
- * Frame cycle depends on systems. Refer to the operation manual for the selected waveform pattern.

Figure 7.3.8-1 Start Trigger Timing

Frame Trigger operation

In Frame Trigger operation, one frame of waveform pattern is output according to the rising timing of the external trigger signal. When the frame output is finished, it'll be in trigger wait state again. The relation between the external trigger signal and waveform pattern output is same as StartTrigger. The operation when Delay is set to "0" and the external trigger signal is input with Frame cycle is shown below.

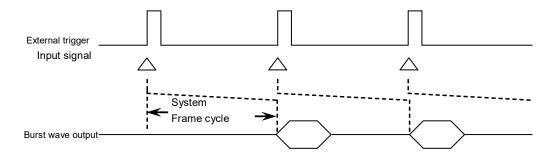


Figure 7.3.8-2 Frame Trigger Timing

When the external trigger signal input cycle is shorter than Frame cycle by N [sample] count or more, the external trigger signal is masked to be an invalid trigger and the burst wave corresponding to the trigger signal cannot be obtained.

 $N \text{ [sample]} = (L_f + L_g) - (L_f + 1)$

- * For L_f and L_g , refer to Start Trigger in the previous section.
- * When Delay is set to + side, Frame cycle is longer by the number of Samples set with Delay.
- * The maximum value of N (Nmax) can be calculated with the equation below according to the Interpolation Ratio (IPLR) determined with Sampling Clock (fs).
- * In the equation above, when N exceeds Nmax, N is assumed to be Nmax.

Nmax=28/IPLR

IPLR: 2ⁿ value that satisfies 160 MHz ≥ IPLR × fs > 80 MHz (n is an integer of 3 or higher)

However, for fs > 20 MHz, IPLR is assumed to be 1.

Here, for example, when $L_f = 140$ symbol, $L_g = 280$ symbol, and Sampling Clock = 50 MHz, the right side of N equation above exceeds Nmax; therefore, N=28 is assumed, and the trigger input with the cycle which is shorter than Frame cycle ($L_f + L_g$) by 28 samples or more is invalid.

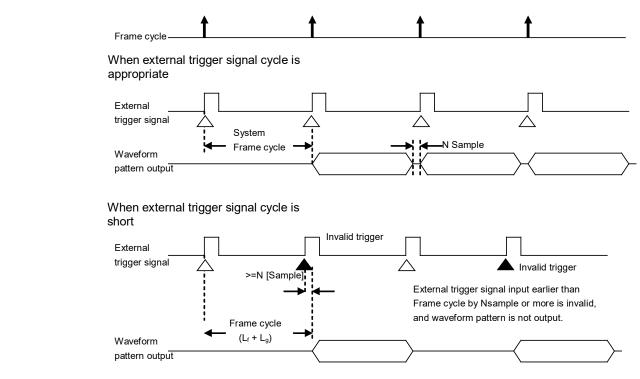


Figure 7.3.8-3 Frame Trigger Cycle

Remote command Enable/disable the trigger to be used for Baseband signal output start Command

[:SOURce[1]|2]:RADio:ARB:TRIGger[:STATe] <boolean>

Query

[:SOURce[1]|2]:RADio:ARB:TRIGger[:STATe]?

0 or 1

Response

<boolean>

Parameter

<boolean></boolean>	Trigger On/Off
ON 1	On
OFF 0	Off

Programming Example

To set trigger to On. RAD:ARB:TRIG ON RAD:ARB:TRIG? > 1

Trigger mode: Mode	Selects the operation output start.	> > Start/Frame Trigger > Mode mode for the trigger to be used for Baseband signal
	In MG3740A, this ca	n be used only when option-020/120 is installed.
	Press F2 Mode on the	e Start/Frame Trigger function menu for selection.
	Start Frame	Start Trigger (Default) Frame Trigger
Remote command	Set the operation mode for the trigger to be used for Baseband signal output start Command [:SOURce[1] 2]:RADio:ARB:TRIGger:MODE STARt FRAMe Query	
	[:SOURce[1] 2]:R	ADio:ARB:TRIGger:MODE?
	Response	
	<mode></mode>	STAR or FRAM
	Parameter	
	<mode></mode>	External trigger operation mode
	STARt	Start trigger
	FRAMe	Frame trigger
	Programming Examp To set the operation of RAD:ARB:TRIG:MOD RAD:ARB:TRIG:MOD > STAR	node for the external trigger to Start trigger. E STAR

Trigger source: Source Mode) or Top>Mode,>>>>Start/Frame Trigger>Source Selects Start/Frame Trigger Source. In MG3740A, this can be used only when option-020/120 is installed. Press F3 Source on the Start/Frame Trigger function menu to open the S/F Trigger function menu for selection of the trigger source. Ext (External) SG1: Input signal of the terminal allocated to SG1 S/F Trigger (Start/Frame Trigger for SG1) (Default) SG2: Input signal of the terminal allocated to SG2 S/F Trigger (Start/Frame Trigger for SG2) (Default) Refer to 7.4 "Route Connectors" for the allocated terminal. Trigger Key Press F8 Trigger Key. Receives remote command * TRG. Bus Sync to SG1 The start of SG1 and SG2 signals are synchronized with the use of the same trigger source as SG1. If SG1 is freerun, they cannot be synchronized (Valid only with SG2). **Remote command** Select Start/Frame Trigger Source Command [:SOURce[1]|2]:RADio:ARB:TRIGger:SOURce KEY|EXT|BUS|SYNC Query [:SOURce[1]|2]:RADio:ARB:TRIGger:SOURce? Response <source> Parameter <source> Trigger signal source KEY Press F8 Trigger Key. EXT SG1: Input signal of the terminal allocated to SG1 S/F Trigger (Start/Frame Trigger for SG1) (Default) SG2: Input signal of the terminal allocated to SG2 S/F Trigger (Start/Frame Trigger for SG2) (Default) Refer to 7.4 "Route Connectors" for the allocated terminal. Receives remote command * TRG. BUS

The start of SG1 and SG2 signals are

synchronized with the use of the same trigger

SYNC

source as SG1. If SG1 is freerun, they cannot be synchronized (Valid only with SG2).

Programming Example

To set the trigger signal source to Trigger Key. RAD:ARB:TRIG:SOUR KEY RAD:ARB:TRIG:SOUR? > KEY

Delay

Mode or Top>Mode,>>>>Start/Frame Trigger>Delay

Sets the delay time from the Trigger input to RF signal output.

In MG3740A, this can be used only when option-020/120 is installed.

Press F4 Delay on the Start/Frame Trigger function menu for setting.

Range	Varies depending on the selected waveform
	pattern.
Resolution	0.01 [SystemUnit]
Default	0
SamplingClock	Baseband signal output sampling clock
	Sampling Clock
SamplingRate	Sampling rate Sampling RateA/B
OverSampling	Over sampling magnification ratio of the
	waveform data
SystemUnit	Data unit for each system (Symbol, Bit, Chip,
	and others)

Remote command

Set the delay time from the Trigger input to RF signal output Command

[:SOURce[1]|2]:RADio:ARB:TRIGger:DELay <ext_numeric>

Query

[:SOURce[1]|2]:RADio:ARB:TRIGger:DELay?

Response

<ext_numeric>

Query

[:SOURce[1]|2]:RADio:ARB:TRIGger:DELay:TIME?

Response

<time>

Unit: s

Parameter	
<ext_numeric></ext_numeric>	Start trigger delay time
Range	Varies depending on the selected waveform
	pattern.
Resolution	0.01
Default	0
Unit	SystemUnit
Suffix code	None
<time></time>	Start trigger delay time
Unit	s
Resolution	1 ps

Programming Example

To set the start trigger delay time to 30 SystemUnit. RAD:ARB:TRIG:DEL 30 RAD:ARB:TRIG:DEL? > 30.00 RAD:ARB:TRIG:DEL:TIME? > 3E-06

Detection edge: Edge

Mode or Top>Mode,> →> Start/Frame Trigger>Edge

Sets the detection edge of Start/Frame trigger input.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F5 Edge** on the Start/Frame Trigger function menu for selection.

Options	
Rise	The trigger is applied at the signal rising edge
	(Default).
Fall	The trigger is applied at the signal falling edge.

Remote command Set the detection edge of Start/Frame trigger input Command Command [:SOURce[1]|2]:RADio:ARB:TRIGger:SLOPe POSitive|NEGative

Query

[:SOURce[1]|2]:RADio:ARB:TRIGger:SLOPe?

Response

<edge>

POS or NEG

Parameter

<edge></edge>	Trigger input detection edge
POSitive	Rise, signal rising edge (Default)
NEGative	Fall, signal falling edge

Programming Example

To set the external trigger polarity to Fall. RAD:ARB:TRIG:SLOP NEG RAD:ARB:TRIG:SLOP? > NEG

Trigger Key

Mode) or Top>Mode,>→>Start/Frame Trigger>Trigger Key

Generates Start/Frame Trigger manually. This is executable only from this menu. It is enabled only when Trigger Key is set with **F3 Source**.

Press **F8 Trigger Key** on the Start/Frame Trigger function menu to apply the trigger.

7.3.9 Setting Frame trigger operation: Event

	Mode or Top>Mode,	>>Start/Frame Trigger>Event
	Frame trigger has fou is used is set.	r types of operations. The trigger operation when it
	In MG3740A, this can	be used only when option-020/120 is installed.
		e Start/Frame Trigger function menu to open the ction menu for selection.
	Options	
	No Retrigger	The trigger received during pattern output is ignored (Default).
	Buffered Trig	The trigger received during pattern output is waited until the current pattern output is completed, and after completion the next frame is output.
	Restart on Trig	The pattern is immediately restarted with the trigger received during pattern output.
Remote command	Set the trigger operat	ion when Frame trigger is used
	Command	
		NDio:ARB:TRIGger:RETRigger
	BUFFered NORetrig	g RESTart
	Query	
	-	Dio:ARB:TRIGger:RETRigger?
	Response	
	<mode></mode>	BUFF, NOR or REST
	Parameter	
	<mode></mode>	Trigger operation when Frame trigger is used
	NORetrig	Triggers received during pattern output are ignored (Default).
	BUFFered	The trigger received during pattern output is waited until the current pattern output is completed, and after completion the next frame is output.
	RESTart	The pattern is immediately restarted with the trigger received during pattern output.

Programming Example

To set the trigger operation when Frame trigger is used to No Retrigger. RAD:ARB:TRIG:RETR NOR RAD:ARB:TRIG:RETR? > NOR

Operation description The trigger operations are described below.

No Retrigger

When Frame Trigger is received in the section where the pattern signal output is not finished and the second pattern start position is in the section where the first pattern signal output is not finished, the second pattern output is not executed, and the trigger is discarded.

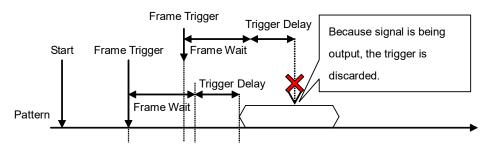


Figure 7.3.9-1 Frame Trigger No Retrigger

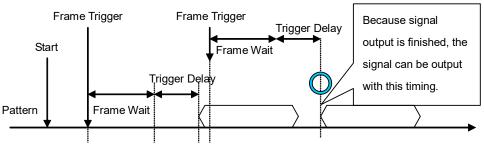


Figure 7.3.9-2 Frame Trigger No Retrigger

Buffered Trigger

When Frame Trigger is received in the section where the pattern signal output is not finished, the second pattern start position is placed to meet the first pattern finish position for output to avoid pattern output overlap.

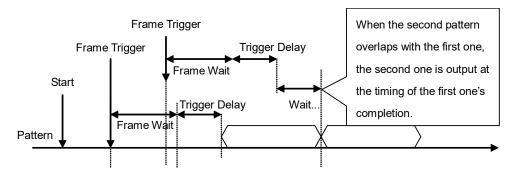


Figure 7.3.9-3 Frame Trigger Buffered Trigger

Restart on Trigger

When Frame Trigger is received in the section where the pattern signal output is not finished and patterns are to be overlapped, the first pattern output is stopped, and the second pattern is overwritten.

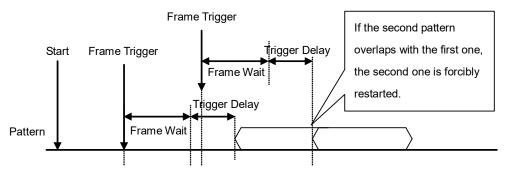


Figure 7.3.9-4 Frame Trigger Restart on Trigger

Note:

Trigger inputs on output wait in each mode above are queued, and output is judged sequentially. The queue size is 16384 (=2^14). If the trigger is input beyond the size, the trigger is discarded. 2^14 is the size which allows all triggers of 10 ms cycle when Delay is the maximum.

7.3.10 Frame Count

Mode or Top>Mode, >>>>Start/Frame Trigger>Frame Count

Sets the number of frames to output when Frame trigger is input during Frame trigger operation.

This is enabled when the trigger mode is set to Frame.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F7 Frame Count** on the Start/Frame Trigger function menu for setting.

Remote command Set the number of frames to output when Frame trigger is input Command

[:SOURce[1]|2]:RADio:ARB:TRIGger:FRAMe:COUNt <integer>

Query

[:SOURce[1]|2]:RADio:ARB:TRIGger:FRAMe:COUNt?

Response

<integer>

Parameter

<integer></integer>	Output Frame Number
Range	1 to 32767
Resolution	1
Default	1
Unit	Frame
Suffix code	None

Programming Example

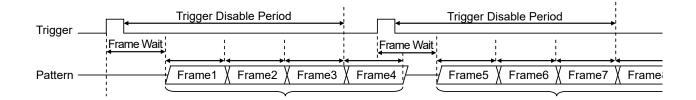
To set 1000 to the number of frames to output when Frame trigger is input. RAD:ARB:TRIG:FRAM:COUN 1000 RAD:ARB:TRIG:FRAM:COUN? > 1000

Refer to the following pages for the Frame Count operation.

When Event is No Retrigger

When Frame Trigger is received in the section where the pattern signal output for the number of frames, which is set to Frame Count, is not finished and the second pattern start position is in the section where the first pattern signal output is not finished, the second pattern output is not executed, and the trigger is discarded. The frame numbering of the second pattern is continued from the first pattern.

The following figure shows an example of when the Frame Count is set to 4.





When Event is Buffered Trigger

When Frame Trigger is received in the section where the pattern signal output for the number of frames, which is set to Frame Count, is not finished, the second pattern start position is placed to meet the first pattern finish position for preventing pattern outputs from overlapping each other. The frame numbering of the second pattern is continued from the first pattern.

The following figure shows an example of when the Frame Count is set to 3.

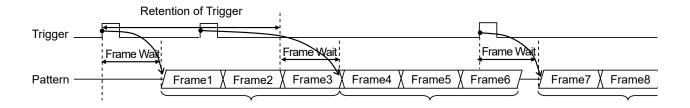
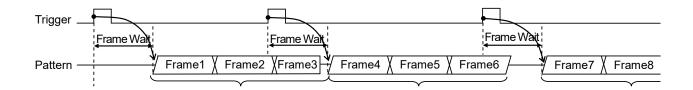


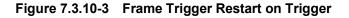
Figure 7.3.10-2 Frame Trigger Buffered Trigger

When Event is Restart on Trigger

When Frame Trigger is received in the section where the pattern signal output for the number of frames, which is set to Frame Count, is not finished, the first pattern output is stopped, and the second pattern is overwritten. The frame numbering of the second pattern begins at the sum of "Frame number at which the output starts" and "Frame Count setting".

The following figure shows an example of when the Frame Count is set to 3.





To add two waves

When combining two signals, each of pattern signals A and B is outputted at its frame length by the number of frames set to Frame Count. At this time, the Trigger Disable period (When Event is No Retrigger) or the Trigger Retention period (When Event is Buffered on Trigger) is established according to the pattern with longer frame length. If one pattern signal with shorter frame length has been output within shorter time, this function holds the final sample level and adds it to the other pattern signal in order to output a combined wave.

The following figure shows an example of when the Frame Count is set to 3.

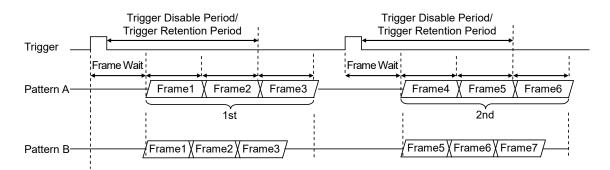


Figure 7.3.10-4 Frame Trigger to add two waves

7.3.11 Baseband Clock

Mode or Top>Mode, >→>Baseband Clock

Sets the settings related to Baseband Clock. This cannot be used in MG3740A.

The Baseband Clock function menu is used when the external reference clock is input to be used for Baseband. The arbitrary Sampling Clock can be generated because the input clock is divided with the divider within the hardware.

This function is used when the 1.2288 MHz multiplication clock is to be the reference signal like the CDMA2000 base station or when the synchronized signals are to be output with the use of the same clock source like MINO.

Press **F3 Baseband Clock** on page 2 of ARB/Waveform function menu to open the Baseband Clock function menu.

Page	Key No.	Menu Display	Function
1	F1	Source Int	Selects the Baseband Reference Clock signal source.
	F2	Division 1/2	Sets the division ratio for the external input Clock for generation of Baseband Reference Clock.
	F3	Out <u>Off</u> On	Sets the Baseband clock reference to Off (not to be output) or On (to be output).

Table 7.3.11-1 Baseband Clock Function Menu

Clock source: Source

Mode or Top>Mode, >>>>Baseband Clock>Source

Selects the Baseband Reference Clock signal source.

This cannot be used in MG3740A.

Press **F1 Source** on the Baseband Clock function menu to open the Baseband Clock Source function menu for selection of the signal source.

This is an independent parameter for each SG. It can be set in the modulation output status (when waveform selection is Mod = On).

	For SG1	
	Int	The internal signal source is the reference (Default).
	Ext	The clock input from the rear panel BB REF Clock Input is the reference. Used for inputting
	Ext(BB Ref Sync)	DUT clock or others. The clock input from the rear panel BB REF
		Clock Input is the reference. Used for
		synchronization for multiple
		MG3710A/MG3710Es. BB REF Clock Output of
		MG3710A/MG3710E must be input as the reference.
	For SG2	
	Int	The internal signal source is the reference
		(Default).
	Sync with 1st SG	Baseband clock used by SG1 is the reference.
Remote command		Reference Clock signal source
	Command	
		ADio:ARB:CLOCk:REFerence[:SOURce]
	INTernal EXTerna	1 EXTSync SYNC
	Query	
	[:SOURce[1] 2]:R	ADio:ARB:CLOCk:REFerence[:SOURce]?
	Response	
	<source/>	INT, EXT, EXTS or SYNC
	Parameter	
	<source/>	Baseband signal reference clock
	INTernal	Int (Default)
	EXTernal	\mathbf{Ext}
	EXTSync	Ext (BB Ref Sync)
	SYNC	Sync with 1st SG
	Programming Exam	ple
		signal reference clock to Ext.
	RAD:ARB:CLOC:REF	EXT
	RAD:ARB:CLOC:REF	?
	> EXT	

Clock division ratio: Division

Mode or Top>Mode,>→>Baseband Clock>Division

Sets the division ratio for the external input Clock for generation of Baseband Reference Clock.

This cannot be used in MG3740A.

Press **F2 Division** on the Baseband Clock function menu to open the Baseband Clock Division function menu for selection of the division ratio.

Range Refer to the table below.

Sampling Rate			Baseband Reference Clock Division setting range								
	[MHz]	l	16	8	4	2	1	1/2	1/4	1/8	1/ 16
0.02	≤f≤	0.048828125	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark				
0.048828125	<f≤< th=""><th>0.09765625</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th></th><th>\checkmark</th><th>\checkmark</th><th></th><th></th><th></th></f≤<>	0.09765625	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark			
0.09765625	<f≤< th=""><th>0.1953125</th><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td></td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td></td><td></td></f≤<>	0.1953125	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark		
0.1953125	<f≤< th=""><th>0.390625</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th></th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th></th><th></th></f≤<>	0.390625	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark		
0.390625	<f≤< th=""><th>3.125</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th></f≤<>	3.125	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
3.125	<f≤< th=""><th>6.25</th><td></td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td></f≤<>	6.25		\checkmark							
6.25	<f≤< th=""><th>12.5</th><td></td><td></td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td></f≤<>	12.5			\checkmark						
12.5	<f≤< th=""><th>25</th><td></td><td></td><td></td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td><td>\checkmark</td></f≤<>	25				\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
25	<f≤< th=""><th>50</th><th></th><th></th><th></th><th></th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th></f≤<>	50					\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
50	<f≤< th=""><th>100</th><th></th><th></th><th></th><th></th><th></th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th><th>\checkmark</th></f≤<>	100						\checkmark	\checkmark	\checkmark	\checkmark
100	<f≤< th=""><th>200</th><td></td><td></td><td></td><td></td><td></td><td></td><td>\checkmark</td><td></td><td></td></f≤<>	200							\checkmark		

Default 1 or within the heavy lines in the table above

Remote command	Set the division ratio for the external input Clock
	Command
	[:SOURce[1]]:RADio:ARB:CLOCk:REFerence:DIVision
	SIXTeenth EIGHth QUARter HALF X1 X2 X4 X8 X16

Query

[:SOURce[1]]:RADio:ARB:CLOCk:REFerence:DIVision?

Response

<clock>

SIXT, EIGH, QUAR, HALF, X1, X2, X4, X8 or X16

Parameter

<clock></clock>	Baseband signal reference clock
SIXTeenth	Sampling Clock × 1/16
EIGHth	Sampling Clock \times 1/8
QUARter	Sampling Clock \times 1/4
HALF	Sampling Clock \times 1/2
X1	Sampling Clock × 1
Х2	Sampling Clock $\times 2$
X4	Sampling Clock × 4
X8	Sampling Clock × 8
X16	Sampling Clock × 16

The setting range is described in Table 7.3.11-2 "Baseband Reference Clock Division".

Programming Example

To set the baseband signal reference clock frequency to sampling clock × 2. RAD:ARB:CLOC:REF:DIV X2

RAD:ARB:CLOC:REF:DIV? > X2

Clock output: Out		
	Mode or Top>Mode, 2	>⊖>>Baseband Clock>Out
	Enables/disables the I	Baseband clock reference output.
	This cannot be used in	n MG3740A.
	Press F3 Out on the B	aseband Clock function menu for setting.
	one SG is installed) or	neter for each SG. This can be set when SG1 (when SG2 (when two SGs are installed) is in the tus (when selecting a waveform and setting Mod to
	Setting range	
	Off	Does not output the Baseband clock reference (Default).
	On	Outputs the Baseband clock reference.
Remote command	Output the Baseband Command [:SOURce]:RADio:A	clock reference RB:CLOCk:REFerence:OUTPut <boolean></boolean>
	Query	
	-	RB:CLOCk:REFerence:OUTPut?
	Response	
	<boolean></boolean>	0 or 1
	Parameter	
	<boolean></boolean>	Frequency relative display On/Off
	OFF 0	Does not output the Baseband clock reference
		(Default).
	ON 1	Outputs the Baseband clock reference.
	Programming Examp	le
	To output the Basebar	
	RAD:ARB:CLOC:REF:	
	RAD:ARB:CLOC:REF:	OUTP?

> 1

Sampling Clock

Queries the Baseband signal output sampling clock. This is a function only with a remote command.

Remote command Query the baseband signal sampling clock Query [:SOURce]:RADio:ARB:SCLock:RATE?

Response

<freq>

Unit: Hz

Parameter

<freq> Range Resolution Sampling clock 140 MHz to 200 MHz 0.001 Hz

Programming Example

To query the sampling clock. RAD:ARB:SCL:RATE? >14000000.000

7.3.12 Marker Setup

Mode or Top>Mode, >→>Marker Setup

Sets the settings related to Marker.

In MG3740A, this can be used only when option-020/120 is installed.

The Marker function is used as the trigger out function when the waveform pattern specified positions (the top of Frame, top of burst, or others) are to be used as triggers.

Press **F4 Marker Setup** on the ARB/Waveform function menu to open the **Marker Setup** dialog box and Marker Setup function menu.

Marker	Setup					
Name	Label	Polarity	Edit Mode	Offset	Width	Cycle
Marker 1 A	Duty 1/2	Positive	On	0 sample	2 sample	2 sample
Marker 2 A	Duty 1/4	Positive	On	0 sample	2 sample	2 sample
Marker 3 A	Duty 1/8	Positive	On	0 sample	2 sample	2 sample
Marker 1 B		Positive	Off	0	1	1
Marker 2 B		Positive	Off	0	1	1
Marker 3 B		Positive	Off	0	1	1

Figure 7.3.12-1 Marker Setup Dialog Box

Marker 1 to 3 indicate Marker number, and A and B indicate the waveform Pattern A and B.

Page	Key No.	Menu Display	Function
1	F1	Marker 1 A	Displays Marker 1 A Setup function menu.
	F2	Marker 2 A	Displays Marker 2 A Setup function menu.
	F3	Marker 3 A	Displays Marker 3 A Setup function menu.
	F4	Marker 1 B	Displays Marker 1 B Setup function menu.
	F5	Marker 2 B	Displays Marker 2 B Setup function menu.
	F6	Marker 3 B	Displays Marker 3 B Setup function menu.

Table 7.3.12-1 Marker Setup Function Menu

Press **F1 Marker 1 A** to **F6 Marker 3 B** on the Marker Setup function menu to open each corresponding Marker Setup function menu. Set the selected waveform Pattern Marker output (output from the rear panel AUX connector). Marker 1 A Setup function menu is described in the table below.

Page	Key No.	Menu Display	Function
1	F1	Edit Mode <u>Off</u> On Sync	Enables/disables the Marker 1 edit function. When set to On/Sync, Marker bit in Pattern is disabled.
	F2	Offset 0.00	Sets Offset from the top output of Pattern to Marker 1 output timing.
	F3	Width 1.00	Sets the output width of Marker 1.
	F4	Cycle 1.00	Sets the output cycle of Marker 1.
	F8	Polarity <u>Positive</u> Negative	Sets the output polarity of Marker 1.

 Table 7.3.12-2
 Marker 1 A Function Menu

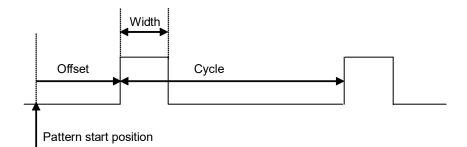


Figure 7.3.12-2 Offset, Width, Cycle

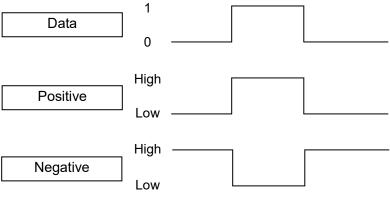


Figure 7.3.12-3 Polarity

Edit Mode	Mode or Top>Mode , >	→→>Marker Setup>Marker 1/2/3 A(B)>Edit Mode	
	Enables/disables the Marker 1 edit function. When set to On/Sync, Marker bit in Waveform Pattern is disabled.		
	In MG3740A, this can be used only when option-020/120 is installed.		
	Press F1 Edit Mode on	the Marker 1/2/3 A(B) function menu for setting.	
	On	Edits the Marker position. Also Marker cycle is set by the user.	
	Off	Uses Marker bit in pattern. (Default).	
	Sync	Edits the Marker position. Marker cycle synchronizes with the Pattern cycle.	
	MG3700A/M MG3740A An (IQproducer ⁴) • OFF can be s pattern that 15-bit or 16-b	pecified for Marker 1, 2, and 3 only if a waveform consists of 14-bit resolution IQ data is selected. If a bit resolution waveform pattern is selected, the trictions apply: tion: Markers 2 and 3 cannot be set to OFF 0.	
Remote command	Enable/disable the Ma Command [:SOURce[1] 2]:RAN] <boolean> PATSyn</boolean>	rker 1/2/3 edit function	
	Query [:SOURce[1] 2]:RAN]?	Dio:ARB:WMA WMB:MARKer1 2 3:EDIT[:STATe	
	Response <mode></mode>	0,1 or PATS	

Parameter	
<mode></mode>	User setting mode
ON 1	Outputs the user setting marker.
OFF 0	Outputs the marker previously recorded in the
	waveform pattern.
PATSync	Outputs the marker at the start of the waveform
	pattern.

Details

OFF | 0 can be specified for Marker 1, 2, and 3 only if a waveform pattern that consists of 14-bit resolution IQ data is selected. If a 15-bit or 16-bit resolution waveform pattern is selected, the following restrictions apply:

15-bit resolution: Markers 2 and 3 cannot be set to ${\tt OFF|0}.$

16-bit resolution: Markers 1 to 3 cannot be set to $OFF \mid 0$.

Programming Example

To set Marker 2 in Pattern A to user setting. RAD:ARB:WMA:MARK2:EDIT ON RAD:ARB:WMA:MARK2:EDIT? > 1

Offset

Mode or Top>Mode, >>>Marker Setup>Marker 1/2/3 A(B)>Offset

Sets Offset from the top output of Waveform Pattern to Marker output timing.

In MG3740A, this can be used only when option-020/120 is installed.

Press F2 Offset on the Marker 1/2/3 A(B) function menu for setting.

Setting range	
Lower limit	0
Upper limit	$(2^24 - 1) \div OverSampling A/B$
	(Rounded off to two decimal places)
Resolution	0.01 [System Unit A/B]
Default	0
OverSampling A/B	Over sampling magnification ratio of the
	waveform data A/B
System Unit A/B	Data unit for each system (Symbol, Bit, Chip,
	and others)

Remote command

Set Offset from the top output of Waveform Pattern to Marker 1/2/3 output timing Command

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:MARKer1|2|3:EDIT:OFFSet <ext numeric>

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:MARKer1|2|3:EDIT:OFFSet
?

Response

<ext_numeric>

Parameter

<ext_numeric> Starting offset value Setting range, resolution, and default Refer to the above explanation. Unit SystemUnit A/B Suffix code None

Programming Example

To set the starting offset of Marker 2 of Waveform Pattern A to 100. RAD:ARB:WMA:MARK2:EDIT:OFFS 100 RAD:ARB:WMA:MARK2:EDIT:OFFS? > 100.00

Output width: Width

Mode or Top>Mode, \rightarrow >Marker Setup>Marker 1/2/3 A(B)>Width Sets the output width of Marker.

In MG3740A, this can be used only when option-020/120 is installed.

Press F3 Width on the Marker 1/2/3 A(B) function menu for setting.

Setting range Lower limit

1 ÷ OverSampling A/B (Rounded off to two decimal places)

	Upper limit Resolution Default OverSampling A/B System Unit A/B	 When Marker1/2/3 Edit ModeA/B is set to "On": (2^24 - 1) ÷ OverSampling A/B (Rounded off to two decimal places) or Marker1/2/3 CycleA/B, whichever smaller When Marker1/2/3 Edit ModeA/B is set to "Sync": (2^24 - 1) ÷ OverSampling A/B (Rounded off to two decimal places) or DataPointA/B ÷ OverSampling A/B, whichever smaller 0.01 [System Unit A/B] 1 Over sampling magnification ratio of the waveform data A/B Data unit for each system (Symbol, Bit, Chip, and others) 			
		and others)			
	DataPointA/B	Waveform pattern cycle			
Remote command	<ext_numeric> Query</ext_numeric>	Dio:ARB:WMA WMB:MARKer1 2 3:EDIT:WIDTh Dio:ARB:WMA WMB:MARKer1 2 3:EDIT:WIDTh?			
	Parameter				
	<ext numeric=""></ext>	Pulse width			
	—				
	Setting range, resolution, and default				
		Refer to the above explanation.			
	Unit	SystemUnit A/B			
	Suffix code	None			
	Programming Example				
	To set the pulse width of Marker 2 of Waveform Pattern A to 50.				
	RAD:ARB:WMA:MARK2:EDIT:WIDT 50				
	RAD:ARB:WMA:MARK2	:EDIT:WIDT?			
	> 50.00				

Cycle

cle					
	Mode or Top>Mode, >	>>>Marker Setup>Marker 1/2/3 A/B>Cycle			
	Sets the output cycle of Marker. In MG3740A, this can be used only when option-020/120 is installed.				
	$\operatorname{Press} \textbf{F4}$ Cycle on the	Marker 1/2/3 A(B) function menu for setting.			
	Setting range				
	Lower limit	1 ÷ OverSampling A/B			
	Upper limit	(Rounded off to two decimal places) (2^24 – 1) ÷ OverSampling A/B			
	Opper mint	(Rounded off to two decimal places)			
	Resolution	0.01 [System Unit A/B]			
	Default	1			
	OverSampling A/B	Over sampling magnification ratio of the waveform data A/B			
	System Unit A/B	Data unit for each system (Symbol, Bit, Chip, and others)			
Remote command	Set the Marker 1/2/3 output cycle				
	Command				
	[:SOURce[1] 2]:RADio:ARB:WMA WMB:MARKer 2 3:EDIT:CYCLe				
	<ext_numeric></ext_numeric>				
	Query				
	[:SOURce[1] 2]:RADio:ARB:WMA WMB:MARKer1 2 3:EDIT:CYCLe?				
	Response				
	<ext_numeric></ext_numeric>				
	Parameter				
	<ext_numeric></ext_numeric>	Output pulse cycle			
	Setting range, resolution, and default				
	Refer to the above explanation.				
	Unit	SystemUnit A/B			
	Suffix code	None			
	Programming Example				
	To set the output pulse cycle of Marker 2 of Waveform Pattern A to 200. RAD:ARB:WMA:MARK2:EDIT:CYCL 200				
	RAD:ARB:WMA:MARK2:EDIT:CYCL?				
	> 200.00				

Polarity

anty					
	Mode or Top>Mode	de, > >>> Marker Setup>Marker 1/2/3 A/B>Polarity			
	Sets the output polarity of Marker.				
	In MG3740A, this	can be used only when option-020/120 is installed.			
	Press F8 Polarity on the Marker 1/2/3 A(B) function menu for setting.				
	Positive	Positive polarity (Default)			
	Negative	Negative polarity			
Remote command	Set the Marker 1/2/3 output polarity				
	Command				
	[:SOURce[1] 2]:RADio:ARB:WMA WMB:MARKer 2 3:POLarity				
	POSitive NEGative				
	Query				
	[:SOURce[1] 2]:RADio:ARB:WMA WMB:MARKer 2 3:POLarity?				
	Response				
	<polarity></polarity>	POS or NEG			
	Parameter				
	<polarity></polarity>	Polarity			
	POSitive	Positive (Positive polarity)			
	NEGative	Negative (Negative polarity)			
	Programming Example				
	To set the polarity of Marker 2 of Waveform Pattern A to Negative.				
	RAD:ARB:WMA:MARK2:POL NEG				
	RAD:ARB:WMA:MARK2:POL?				
	> NEG				

7.3.13 Sequence Mode

Mode or Top>Mode, >→>Sequence Mode

Sequence Mode is to play the waveform patterns in the specified sequence.

In MG3740A, this can be used only when option-020/120 is installed.

For the creation method for combination files for Sequence Mode, refer to MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducerTM).

Press **F7 Sequence Mode** on page 2 of ARB/Waveform function menu to open the **Sequence Progress** dialog box and Sequence Mode function menu.

Index	Package Name	Pattern Nar	ne	Repeat	Frequency Offset	Level
1	Test	BBDC		1	0 Hz	0.00 dB
2	TestWvc2	BBDCp1		1	0 Hz	0.00 dB
3	Test	BBDC		1	0 Hz	0.00 dB
otal :	3					
ARB			Power Mete	r	BER	
On			A: Off		Stop 0.000EH	
Seq.(/	4+R)		B: Off		0	/0

Figure 7.3.13-1 Sequence Progress Dialog Box

Index	Element (each element of Sequence Mode) number
Package Name	Package name
Pattern Name	Pattern file name
Repeat	Repetition count of the element
Frequency Offset	Frequency offset of the element based on
	Baseband center frequency
Level	Level ratio of each element
	When Add Pattern is not set, the element of the
	highest output level becomes the reference.
	When Add Pattern is set, the output level of Add
	Pattern becomes the reference.
Total	Displays the number of elements in Sequence
	Mode.

Note:

For Add Pattern, refer to 4.8.2 "Combination File Edit screen" in MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducerTM).

Page	Key No.	Menu Display	Function
1	F1	Next Pattern	Proceeds with the elements of the sequence mode to the next element.
	F2	Sequence Restart	Restarts the elements from the top in the sequence mode.
	F3	Play Mode <u>Auto</u> Manual	Selects the play mode for elements of the sequence mode.
	F4	Repeat Mode <u>Continuous</u> Single	Selects the operation after the last element is executed in the sequence mode.
	F5	PatternTrigger	Displays the Pattern Trigger function menu. Refer to 7.3.14 "PatternTrigger".

Table 7.3.13-1	Sequence	Mode	Function	Menu
----------------	----------	------	----------	------

Next Pattern

Mode) or Top>Mode, >>>>Sequence Mode>Next Pattern

The elements of the sequence mode is proceeded with to the next element.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Next Pattern** on the Sequence Mode function menu for execution.

Remote command Proceed with the elements of the sequence mode to the next element Command

[:SOURce[1]|2]:RADio:ARB:SEQuence:NEXT

Programming Example

To proceed with the elements of the sequence mode to the next element. RAD:ARB:SEQ:NEXT

Sequence Restart			
•	Mode or Top>Mode	e,>⊖→>Sequence Mode>Sequence Restart	
	Restarts the elements from the top in the sequence mode.		
	In MG3740A, this ca	an be used only when option-020/120 is installed.	
	Press F2 Sequence execution.	Restart on the Sequence Mode function menu for	
Remote command	Restart the element Command	s from the top in the sequence mode	
	:INITiate[1] 2:2	ARB:SEQuence[:IMMediate]	
	Related command		
		mmand to obtain the play status and to wait for	
	completion.		
	[:SOURce[1] 2]:	RADio:ARB:SEQuence:REGister[:STATus]?	
	Programming Exam	nple	
	To restart SG1 outp	ut elements from the top in the sequence mode.	
	INIT:ARB:SEQ		
Remote command	Query the playback status of the sequence mode		
	Query		
	[:SOURce[1] 2]:	RADio:ARB:SEQuence:REGister[:STATus]?	
	Response		
	<status></status>		
	Parameter		
	<status></status>	Playback status	
	$bit2: 2^2 = 4$	(0: Paused, 1: Playback)	
	bit0, 1, 3 to 15	Not used	
	Details		
	"Playing" is returne	d during trigger waiting.	
	Related command		
		mmand for the pattern play status.	
	_	RADio:ARB:REGister[:STATus]?	
	Programming Exam	nple	
		Itput play status in the sequence mode.	
	RAD:ARB:SEQ:REG		
	> 4		

Play Mode Mode or Top>Mode,>>>>Sequence Mode>Play Mode Selects the play mode for elements of the sequence mode. In MG3740A, this can be used only when option-020/120 is installed. Press F3 Play mode on the Sequence Mode function menu for selection. Auto Proceeds with elements automatically. Manual Proceeds with elements manually. **Remote command** Select the play mode for elements of the sequence mode Command [:SOURce[1] | 2]:RADio:ARB:SEQuence:MODE AUTO | MANual Query [:SOURce[1]|2]:RADio:ARB:SEQuence:MODE? Response <mode> AUTO | MANual Parameter <mode> Play mode for elements AUTO Proceeds with elements automatically. MANual Proceeds with elements manually. **Programming Example** To set the play mode for elements of the sequence mode to automatic. RAD:ARB:SEQ:MODE AUTO RAD:ARB:SEQ:MODE?

> AUTO

Repeat Mode Mode or Top>Mode,>>>>Sequence Mode>Repeat Mode Selects the operation after the last element is executed in the sequence mode. In MG3740A, this can be used only when option-020/120 is installed. Press F4 Repeat mode on the Sequence Mode function menu for selection. Continuous After the last element is executed, the execution of signal output is continued returning to the first element. Single After the last element is executed, execution is stopped. **Remote command** Select the operation after the last element is executed in the sequence mode Command INITiate[1]|2:ARB:SEQuence:CONTinuous[:ALL] <boolean> Query INITiate[1] | 2:ARB:SEQuence:CONTinuous[:ALL]? Response 0 or 1 <boolean> Parameter <boolean> Operation after the last element is executed ON | 1 Continuous OFF | 0 Single **Programming Example**

To set the sequence mode to Single. INIT:ARB:SEQ:CONT OFF INIT:ARB:SEQ:CONT? > 0

Remote command

Set the RepeatCount of each index for Sequence Mode Command

[:SOURce[1]|2]:RADio:ARB:SEQuence:ELEMent:RCOunt
<integer>,<ext_integer>

Query

[:SOURce[1]|2]:RADio:ARB:SEQuence:ELEMent:RCOunt?
<integer>

Response

<ext_integer>

Parameter

Index
1 to 200
1
None
RepeatCount
RepeatCount 0 to 65535
1
0 to 65535

Programming Example

To set the RepeatCount at Index = 1 to 100. RAD:ARB:SEQ:ELEM:RCO 1,100 RAD:ARB:SEQ:ELEM:RCO? 1 > 100

7.3.14 Pattern Trigger

Mode or Top>Mode,>>>>Sequence Mode>PatternTrigger

Uses the pattern trigger to proceed with patterns to the next pattern in the sequence mode.

In MG3740A, this can be used only when option-020/120 is installed.

Note:

In the sequence mode, the pattern trigger and pattern status are used as the trigger to be used to proceed with patterns to the next pattern. Switching of the pattern trigger and pattern status depends on the internal setting of the waveform pattern. The pattern status operation is described in the last half of this section.

Press **F5 Pattern Trigger** on the Sequence Mode function menu to open the **Pattern Trigger Info** dialog box and Pattern Trigger function menu.

Pattern Trigger	On			
Pattern Trigger Mode	3 Triggers			
Switching Point	Pattern			
Name	State	Source	Edge	
Pattern Trigger 1	State Off	Source Ext	Edge Rise	
	-1	1		

Figure 7.3.14-1 Pattern Trigger Info Dialog Box

Table 7.3.14-1 Pattern Trigger Function Me	nu
--	----

Page	Key No.	Menu Display	Function
1	F1	Pattern Trigger <u>Off</u> On	Sets whether the trigger is to be used or not to be used for Sequence Mode pattern switching.
	F2	Pattern Trigger 1	Displays the Pattern Trigger 1 function menu.
	F3	Pattern Trigger 2	Displays the Pattern Trigger 2 function menu.
	F4	Pattern Trigger 3	Displays the Pattern Trigger 3 function menu.
	F5	Switching Point <u>Pattern</u> Frame	Selects the switching timing to move to the next element on pattern trigger input.
	F8	Trigger Key	Generates Pattern Trigger manually. This is executable only from this menu. When Pattern Trigger Source is Trigger Key, executing this function applies the trigger.

Pattern Trigger				
	Mode or Top>Mode, >→>Sequence Mode>PatternTrigger >PatternTrigger			
	Sets whether the trigger is to be used or not to be used for Sequence Mode pattern switching. In MG3740A, this can be used only when option-020/120 is installed.			
	Press F1 Pattern Trigger on the Pattern Trigger function menu for setting.			
	On	Uses the trigger.		
	Off	Does not use the trigger (Default).		
Remote command	Set whether the trigger is to be used or not to be used for Sequence			
	Mode pattern switching			
	Command			
	[:SOURce[1] 2]:RADio:ARB:SEQuence:TRIGger[:STATe]			
	<boolean></boolean>			
	Query			
	[:SOURce[1] 2]	:RADio:ARB:SEQuence:TRIGger[:STATe]?		
	Response			
	<boolean></boolean>	0 or 1		
	Parameter			
	<boolean></boolean>	Trigger On/Off		
	OFF 0 Uses the trigger.			
	ON 1	Does not use the trigger (Default).		
	Programming Exa	ample		
	To use the trigger	To use the trigger for Sequence Mode pattern switching.		
	RAD:ARB:SEQ:TR	IG ON		
	RAD:ARB:SEQ:TR	IG?		
	> 1			

Pattern Trigger 1/2/3

Mode or Top>Mode, >→>Sequence Mode>PatternTrigger

>PatternTrigger 1/2/3

Sets the pattern trigger 1/2/3.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F2 Pattern Trigger 1** to **F4 Pattern Trigger 3** on the Pattern Trigger function menu to display the Pattern Trigger 1 to Pattern Trigger 3 function menus. Pattern Trigger 1 function menu is described in the table below.

Page	Key No.	Menu Display	Function
1	F1	Pattern Trigger 1 <u>Off</u> On	Enables/disables the pattern trigger 1.
	F2	Source <u>Ext</u> Bus Key	Sets the trigger source of the pattern trigger 1.
	F3	Edge <u>Rise</u> Fall	Sets the edge of the pattern trigger 1.

Table 7.3.14-2 Pattern Trigger 1 Function Menu

Pattern Trigger 1/2/3 On/Off: Pattern Trigger 1/2/3

Mode or Top>Mode, >→>Sequence Mode>PatternTrigger >PatternTrigger 1/2/3>PatternTrigger 1/2/3

Enables/disables the pattern trigger 1/2/3.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F1 Pattern Trigger 1/2/3** on the Pattern Trigger 1/2/3 function menu for setting.

On	Enables the pattern trigger $1/2/3$.
Off	Disables the pattern trigger 1/2/3 (Default).

Remote command Enable/disable the pattern trigger 1/2/3 Command [:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger1|2|3:STATe <boolean>

Query

[:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger1|2|3:STATe?

Response

<boolean> 0 or 1

Parameter

<boolean>Trigger On/OffOFF | 0Disables the pattern trigger 1/2/3 (Default).ON | 1Enables the pattern trigger 1/2/3.

Programming Example

To enable the pattern trigger 1. RAD:ARB:SEQ:TRIG1:STAT ON RAD:ARB:SEQ:TRIG1:STAT? > 1

Trigger source: Source

Mode or Top>Mode, >	Sequence Mode>PatternTrigger	
>PatternTrigger 1/2/3>Source		
Sets the pattern trigger 1/2/3 trigger source.		
In MG3740A, this can be used only when option-020/120 is installed.		
Press F2 Source on the Pattern Trigger $1/2/3$ function menu for setting.		
Ext	Terminal set to PatternTrig1/2/3 with	
	RouteInputConnectors (Default)	
Bus	Remote command	
Key	Trigger Key	

Remote command Set the pattern trigger 1/2/3 trigger source Command [:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger1|2|3:SOURce KEY|EXT|BUS KEY

Query

[:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger1|2|3:SOURce?

Response

<mode>

EXT, BUS or KEY

Parameter

<mode></mode>	Trigger source
EXT	Terminal set to PatternTrig $1/2/3$ with
	RouteInputConnectors (Default)
BUS	Remote command
KEY	Trigger Key

Programming Example

To set the pattern trigger 1 trigger source to Trigger Key. RAD:ARB:SEQ:TRIG1:SOUR KEY RAD:ARB:SEQ:TRIG1:SOUR? > KEY

Pattern Status

The pattern status is a type of trigger to be used to proceed with patterns to the next pattern in the sequence mode.

In MG3740A, this can be used only when option 020/120 is installed.

While the pattern trigger 1/2/3 become three triggers independently, the pattern status create eight trigger statuses with three signal statuses.

To use the pattern status, the use of the pattern status must be set to the waveform pattern in advance.

The relation of Status and Status terminal is shown in the figure below.

Status	Pattern Status 1	Pattern Status 2	Pattern Status 3
0	High	High	High
1	Low	High	High
2	High	Low	High
3	Low	Low	High
4	High	High	Low
5	Low	High	Low
6	High	Low	Low
7	Low	Low	Low

 Table 7.3.14-3
 Relation of Status 0 to 7 and Status Terminal

Edge

ge					
	Mode or Top>Mo	ode, >⊖→>Sequence Mode>PatternTrigger			
	>PatternTrigger	> PatternTrigger 1/2/3>Edge Sets the pattern trigger 1/2/3 edge.			
	Sets the pattern				
	In MG3740A, thi	s can be used only when option-020/120 is installed.			
	Press F3 Edge on the Pattern Trigger 1/2/3 function menu for se				
	Rise	Applies the trigger at the signal rising. (Default)			
	Fall	Applies the trigger at the signal falling.			
Remote command	Set the pattern tr	igger 1/2/3 edge			
	Command				
	[:SOURce[1] 2]:RADio:ARB:SEQuence:TRIGger1 2 3:SLOPe				
	POSitive NEGative				
	Query				
	[:SOURce[1] 2]:RADio:ARB:SEQuence:TRIGger1 2 3:SLOPe?				
	Response				
	<mode></mode>	POS or NEG			
	Parameter				
	<mode></mode>	Pattern trigger edge			
	POSitive	Rise, the trigger is applied at the signal rising.			
		(Default)			
	NEGative	Fall, the trigger is applied at the signal falling.			
	Programming Ex	ample			
	To apply the trigger to the pattern trigger 1 edge at the signal rising.				
	RAD:ARB:SEQ:TRIG1:SLOP POS				
	RAD:ARB:SEQ:TRIG1:SLOP?				
	> DOC				

> POS

Switching Point

Mode or Top>Mode, >→>Sequence Mode>PatternTrigger >Switching Point

Selects the switching timing to move to the next element on pattern trigger input.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F5 Switching Point** on the Sequence Mode function menu for selection.

Pattern

Frame

Switched to the next element with the data length of the waveform pattern of each element as the base unit (Default). Switched to the next element with the frame

length of the waveform pattern of each element as the base unit.

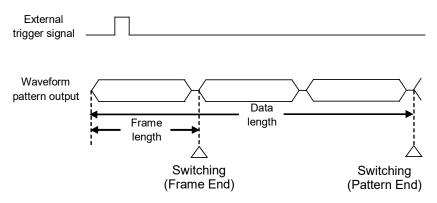


Figure 7.3.14-2 Switching Timing

Remote command Select the switching timing to move to the next element on pattern trigger input Command [:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger:SPOint PATTen|FRAMe Query

[:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger:SPOint?

Response

<mode>

PATT or FRAM

Parameter	
<mode></mode>	Switching timing to move to the next element
PATTern	Switched to the next element with the data
	length of the waveform pattern of each element
	as the base unit (Default).
FRAMe	Switched to the next element with the frame
	length of the waveform pattern of each element
	as the base unit.

Programming Example

To set the switching timing base unit to move to the next element on pattern trigger input to the frame length. RAD:ARB:SEQ:TRIG:SPO FRAM RAD:ARB:SEQ:TRIG:SPO? > FRAM

Trigger Key

Mode or Top>Mode, >→>Sequence Mode>PatternTrigger >Trigger Key

Generates Pattern Trigger manually. This is executable only from this menu. It is enabled only when Trigger Key is set with **F2 Source** on the Pattern Trigger 1/2/3 function menu.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F8 Trigger Key** on the Pattern Trigger function menu to apply the trigger.

7.3.15 Sync Multi SG

Mode) or Top>Mode,>→>Sync Multi SG

Sync Multi SG function is used to output signals with synchronized timings or phases among multiple SGs.

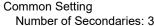
In MG3740A, the Sync Multi SG function cannot be used.

The MG3710A/MG3710E can have the synchronization system with up to four units. Sharing each Local signal, baseband clock, and trigger signal allows output of phase coherent signals with the same signal output timings. If four units of 2nd RF option-installed MG3710A/MG3710E are used, 8x8 MIMO system configuration will be available.

This function allows easy setting necessary for the synchronization system configuration with multiple MG3710A/MG3710Es.(The Local signal input/output and baseband lock input/output require the Universal Input/Output option.)

Note:

When several MG3710A/MG3710E units are connected, sometimes the output level of the MG3710A/MG3710E LO Output is outside the LO Input it level range, depending on the set frequency. In this case, use an external LO signal source to input a LO signal with the appropriate level to the MG3710A/MG3710E LO Input connector.



LO Sync: On

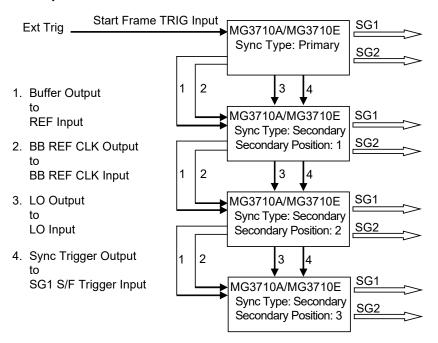


Figure 7.3.15-1 Sync Multi SG Configuration

SG1/2 synchronization procedure

The method to synchronize the phases and timings of signals output from SG1/2 with the use of the Multi SG Sync function is explained.

- 1. Phase synchronization
- 1.1 Output waveform patterns which become 0 Hz (= DC) on Baseband from both SG1 and SG2.

Waveform pattern	BBDC (Waveform pattern where I-phase is
	1-fixed and Q-phase is 0-fixed)
Frequency	Same setting value
	(frequency to be used after synchronization)
Level	Same setting value
	(level to be used after synchronization)
Mod	On
RF	On
ATT Hold	On
Changing frequency	/level changes the internal path length;
therefore, phase/tim	ing synchronization must be executed
again.(When ATT H	old = On, changing the level does not change
the path length.)	

1.2 Execute the synchronization setting for SG1 and SG2.

Sync Type	SG1&2
LO Sync	On

When the option-017/117 is installed, SG1/2 Local signal and Baseband Reference Clock are connected within the unit. The synchronization can be executed without change.

- 1.3 Execute I/Q DC Cal for both SG1 and SG2, and minimize carrier leakage.
- 1.4 When synchronizing several MG3710A/MG3710E units, connect them as shown.

When synchronizing several MG3710A/MG3710E units, connect them as shown in items 1 to 4 of Figure 7.3.15-1 Sync Multi SG Composition and set Sync Type, Number of Secondaries, Secondary Position, and LO Sync at each SG.

Note:

When several MG3710A/MG3710E units are connected, sometimes the output level of the MG3710A/MG3710E LO Output is outside the LO Input level range, depending on the set frequency. In this case, use an external LO signal source to input a LO signal with the appropriate level to the MG3710A/MG3710E LO Input connector. 1.5 Input the mixed wave of SG1 and SG2 to the spectrum analyzer. Input the mixed wave of SG1/2 to the spectrum analyzer as shown in the figure below.

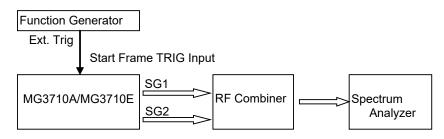


Figure 7.3.15-2 Phase Synchronization/Timing Synchronization Adjustment

1.6 Adjust the I/Q Phase of SG1 (coarse adjustment).

Estimate the phase difference between SG1/2 using the behavior where CW signals with the phase difference of 180 degrees negate each other. Adjust the SG1 I/Q Phase to the values where the mixed wave output level becomes the minimum.

1.7 Adjust the level of SG1.

Adjust the level of SG1 to reduce the level difference between SG1/2 close to zero because the level difference between SG1/2 remains as the residual level. Adjust the level of SG1 to the value where the mixed wave output level becomes the minimum.

1.8 Adjust the I/Q Phase of SG1 (fine adjustment).

Adjust the SG1 I/Q Phase to the values where the mixed wave output level becomes the minimum again.

2. Timing synchronization

Adjust the timing synchronization continuously after the phase synchronization is completed.

2.1 Output waveform patterns to be used from both SG1/2.

Waveform patternSame setting (arbitrary waveform pattern)ATT HoldOn

2.2 Adjust the I/Q Delay of SG1 (coarse adjustment).

Estimate the timing difference between SG1/2 using the behavior where CW signals with the phase difference of 180 degrees negate each other. Adjust the SG1 I/Q Delay to the values where the mixed wave output level becomes the minimum.

2.3 Adjust the level of SG1.

Adjust the level of SG1 to reduce the level difference between SG1/2 close to zero because the level difference between SG1/2 remains as the residual level. Adjust the level of SG1 to the value where the mixed wave output level becomes the minimum.

2.4~ Adjust the I/Q Delay of SG1 (fine adjustment).

Adjust the I/Q Delay of SG1.

2.5~ Add +180 degrees to the I/Q Phase of SG1.

Add +180 degrees to the I/Q Phase value of SG1 in Step 1.8 and set the I/Q Phase again. They are changed from reversed status to in-phase status.

Display description

Press **F8 Sync Multi SG** on the ARB/Waveform function menu page 2 to display the Sync Multi SG.

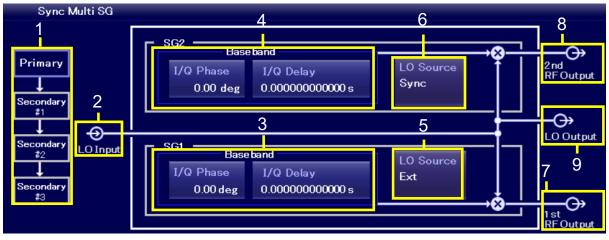


Figure 7.3.15-3 Sync Multi SG

Notes:

- The figure above is for explanation; it is different from the actual display.
- SG2-related blocks are displayed when SG2 (Option 062/162, 064/164 or 066/166) is installed.

No.	Display Example	Display	Description
1	Primary Secondary #1 Secondary #2 Secondary #3	Primary, Secondary#1 to Secondary#3	Displays the order of connecting MG3710A/MG3710E units when using several MG3710A/MG3710E units. This is displayed when Sync Type is Primary or Secondary. The number of Secondaries displayed depends on the "Number of Secondaries" setting.
2	→ LO Input	LO Input	Indicates the Local signal source is set to Ext (input from the rear LO Input connector).
	Docoband	SG1	
3	I/Q Phase I/Q Delay 0.00 deg 0.00000000000 s	I/Q Phase	Displays the I/Q Phase setting for SG1.
		I/Q Delay	Displays the I/Q Delay setting for SG1.
	Baseband	SG2	
4	I/Q Phase I/Q Delay 0.00 deg 0.00000000000 s	I/Q Phase	Displays the I/Q Phase setting for SG2.
		I/Q Delay	Displays the I/Q Delay setting for SG2.
5	L0 Source Ext	LO Source (SG1)	Indicates the status of the Local signal source for SG1. The status of the Local signal source for SG1 can be switched between Int and Ext by clicking this block.
6	LO Source Sync	LO Source (SG2)	Indicates the status of the Local signal source for SG2. The status of the Local signal source for SG2 can be switched between Int and Sync by clicking this block.
7	1st RF Output	1st RF Output	Indicates that the RF Output of SG1 is On.
8	2nd RF Output	2nd RF Output	Indicates that the RF Output of SG2 is On.
9		LO Output	Indicates the Local signal external output setting (output from the rear LO Output connector) is On.

Table 7.3.15-1	Sync Multi SG Display Contents
----------------	--------------------------------

Press **F8 Sync Multi SG** on page 2 of ARB/Waveform function menu to open the Sync Multi SG function menu. Also the Sync Multi SG control is also displayed.

Page	Key No.	Menu Display	Function
1	F1	Sync Type Off	Sets the synchronization mode.
	F2	Number of Secondaries 1	Sets the number of connected Secondaries. This is enabled when SyncType is Primary or Secondary.
	F3	Secondary Position 1	Sets the position of MG3710A/MG3710E when SyncType is Secondary. This is enabled when SyncType is Secondary. It is used for setting judgment such as the case Lo Out is set to Off for connection termination.
	F4	LO Sync <u>Off</u> On	Enables/disables the Local synchronization. This is used to synchronize signal phases from SGs.
	F5	Sync	Starts synchronization for multiple SGs. This is enabled when SyncType is Primary or Secondary.
	F6	Waveform Restart	Simultaneously restarts each waveform pattern selected by SG1 and SG2 when SG2 (Option 062/162, 064/164 or 066/166) is installed.
	F7	I/Q Phase 0.00 deg	Adjusts the Baseband signal phase. This is used to adjust multiple SGs signal phases with MIMO or beam forming.
	F8	I/Q Delay 0.000000000000 s	Adjusts the Baseband signal output timings. This is used when multiple SGs are to be synchronized and timings for signals to reach to DUT are to be adjusted.

Table 7.3.15-2 Sync Multi SG Function Menu

Sync Type

Mode or Top>Mode,>→>Sync Multi SG>Sync Type

Sets the synchronization mode.

Press **F1 Sync Type** on the Sync Multi SG function menu to open the Sync Type function menu for selection of the synchronization mode.

Off	Does not execute synchronization (Default).
Primary	Synchronizes multiple SGs. MG3710A/MG3710E
	is positioned as Primary. When SG2 is installed,
	SG1 and SG2 are synchronized.
Secondary	Synchronizes multiple SGs. MG3710A/MG3710E
	is positioned as Secondary. When SG2 is
	installed, SG1 and SG2 are synchronized.
SG1 & SG2	Synchronizes SG1 and SG2 of
	MG3710A/MG3710E.

Remote command	Set the synchronization mode Command [:SOURce]:RADio:ARB:MBSYnc OFF SG12 PRIMary SECondary		
	Query [:SOURce]:RADio:ARB:MBSYnc?		
	Response		
	<mode></mode>	OFF,SG12,PRIM or SEC	
	Parameter		
	<mode></mode>	Synchronization mode	
	OFF	Does not execute synchronization (Default).	
	PRIM	Synchronizes multiple SGs. MG3710A/MG3710E	
		is positioned as Primary. When SG2 is installed,	
		SG1 and SG2 are synchronized.	
	SEC	Synchronizes multiple SGs. MG3710A/MG3710E	
		is positioned as Secondary. When SG2 is	
		installed, SG1 and SG2 are synchronized.	
	SG12	Synchronizes SG1 and SG2 of	
		MG3710A/MG3710E.	

Programming Example

To set to the mode to synchronizes SG1 and SG2 of MG3710A/MG3710E. RAD:ARB:MBSY SG12 RAD:ARB:MBSY? > SG12

Number of Secondaries

Mode or Top>Mode,>→>Sync Multi SG>Number of Secondaries

Sets the number of connected Secondaries. This is enabled when SyncType is Primary or Secondary.

Press **F2 Number of Secondaries** on the Sync Multi SG function menu for setting.

Range	$1 \mbox{ to } 3$
Resolution	1
Default	1

Remote command

Set the number of connected Secondaries Command

[:SOURce]:RADio:ARB:MBSYnc:NSECondaries <ext integer>

Query

[:SOURce]:RADio:ARB:MBSYnc:NSECondaries?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	T
Range	1
Resolution	1
Default	1
Suffix code	Ν

The number of connected Secondaries 1 to 3 1 1 None

Programming Example

To set the number of connected Secondaries to 2. RAD:ARB:MBSY:NSEC 2 RAD:ARB:MBSY:NSEC? > 2

Secondary Position

Mode or Top>Mode, >>>Sync Multi SG>Secondary Position

Sets the position of MG3710A/MG3710E when SyncType is Secondary. This is enabled when SyncType is Secondary. It is used for setting judgment such as the case Lo Out is set to Off for connection termination.

Press **F3 Secondary Position** on the Sync Multi SG function menu for setting.

Range	1 to 3
Resolution	1
Default	1

Remote command

Set the position of MG3710A/MG3710E when SyncType is Secondary Command

[:SOURce]:RADio:ARB:MBSYnc:SREFerence <ext_integer>

Query

[:SOURce]:RADio:ARB:MBSYnc:SREFerence?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	Position of MG3710A/MG3710E
Range	1 to 3
Resolution	1
Default	1
Suffix code	None

Programming Example

To set the position of MG3710A/MG3710E when SyncType is Secondary to 2. RAD:ARB:MBSY:SREF 2 RAD:ARB:MBSY:SREF? > 2

Local synchronization: LO Sync

Mode or Top>Mode, >→>Sync Multi SG>LO Sync

Enables/disables the Local synchronization. This is used to synchronize signal phases from SGs.

Press F4 LO Sync on the Sync Multi SG function menu for setting.

Off Does not execute Local synchronization (Default). On Executes Local synchronization.

Remote command	Enable/disable the Local synchronization		
	Command		
	[:SOURce]:RADi	o:ARB:MBSYnc:LOSYnc <boolean></boolean>	
	Query		
	[:SOURce]:RADio:ARB:MBSYnc:LOSYnc?		
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	Local synchronization On/Off	
	OFF 0	Does not execute Local synchronization	
		(Default).	
	ON 1	Executes Local synchronization.	
	Programming Exa	ample	
	To set the Local s	ynchronization to On.	
	RAD:ARB:MBSY:I	LOSY ON	
	RAD:ARB:MBSY:I	JOSY?	
	> 1		
Sync			
-)	Mode or Top>M d	ode, >⊖→>Sync Multi SG>Sync	
		or multiple SGs is started. This is enabled when	
	SyncType is Prim		
	To start the signa	l output with the same trigger signal, execute Sync	
	starting from SGs	of latter part, and when all SGs are in trigger waiting	
	status, input the	trigger to Primary SG.	
	$\mathrm{Press}\ \mathbf{F5}\ \mathbf{Sync}\ \mathrm{on}$	the Sync Multi SG function menu for setting.	
Remote command	Start synchroniza	ation for multiple SGs	
	Command		
		o:ARB:MBSYnc:SSECondaries	
	Programming Exa	ample	
	To start synchron	ization for multiple SGs.	

RAD:ARB:MBSY:SSEC

Waveform Restart	
	or Top>Mode, >→>Sync Multi SG>Waveform Restart
	Simultaneously restarts each waveform pattern selected by SG1 and SG2
	when SG2 (Option 062/162, 064/164 or 066/166) is installed. SG1 and
	SG2 enter the Waiting-for-Trigger state when the trigger is to be used for
	Baseband signal output start.
	$\operatorname{Press}{\mathbf{F6}}$ Waveform Restart on the Sync Multi SG function menu for
	setting.
Remote command	Restarts each waveform pattern selected by SG1 and SG2
	Command
	[:SOURce]:RADio:ARB:MBSYnc:RESTart
	Programming Example
	To restart each waveform pattern selected by SG1 and SG2.
	RAD:ARB:MBSY:REST

I/Q Phase

Fliase					
	Mode or Top>Mode, >→>Sync Multi SG>I/Q Phase				
	Adjusts the Basel	oand signal IQ phase.			
	-	just multiple SGs signal phases with MIMO or beam			
	forming. The setting is same as F5 I/Q Phase in Table 7.6.4-1 "Internal				
	Baseband Adjust Function Menu".				
	-				
	Press F7 I/Q Phas	se on the Sync Multi SG function menu for adjustment.			
	Range	-360 deg to 360 deg			
	Resolution	0.01 deg			
	Default	0 deg			
Remote command	Adjust the Baseh	and signal IQ phase			
Remote command	Command	Adjust the Baseband signal IQ phase			
		:DM:IQADjustment:PHASe <phase></phase>			
	[.300KCe[1] 2]	.DM.IQADJUStment.PhASe (phase)			
	Query				
	[:SOURce[1] 2]	:DM:IQADjustment:PHASe?			
	Response				
	<phase></phase>	Unit: deg			
	Parameter				
	<phase></phase>	Baseband signal phase			
	Range	-360 deg to 360 deg			
	Resolution	0.01 deg			
	Default	0 deg			
	Suffix code	DEG, When omitted: DEG			
	Sum code	DEG, when omitted DEG			
	Programming Ex	Programming Example			
	To set the Baseband signal IQ phase to 5 deg. DM:IQAD:PHAS 5				
	DM:IQAD:PHAS?				
	> 5.00				

I/Q Delay Mode or Top>Mode,>>>>Sync Multi SG>I/Q Delay Adjusts the Baseband signal output timings. This is used when multiple SGs are to be synchronized and timings for signals to reach to DUT are to be adjusted. The setting is same as F7 I/Q Delay in Table 7.6.4-1 "Internal Baseband Adjust Function Menu". Press F8 I/Q Delay on the Sync Multi SG function menu for adjustment. Range -400 ns to 400 ns Resolution $1 \, \mathrm{ps}$ Default 0 s**Remote command** Adjust the Baseband signal IQ output timing Command [:SOURce[1]|2]:DM:IQADjustment:DELay <time> Query [:SOURce[1]|2]:DM:IQADjustment:DELay? Response <time> Unit: S Parameter <time> Baseband signal output timings Range -400 ns to 400 ns Resolution $1 \, \mathrm{ps}$ Default $0 \mathrm{s}$ Suffix code S, MS, US, NS, PS, When omitted: S **Programming Example** To set the time difference between I phase and Q phase to 300 ns. DM:IQAD:DEL 300NS DM: IQAD: DEL? > 0.00000300000

7.4 Route Connectors

Top> > Route Connectors

Sets signals of the input and output connectors. This setting is common for the entire MG3710A/MG3710E/MG3740A.

Press **F4 Route Connectors** on page 2 of the top function menu to open the Route Connectors function menu.

Page	Key No.	Menu Display	Function
1	F1	Route Input Connectors	Displays the Input Connectors function menu to set the input signals. Refer to 7.4.1 "Route Input Connectors".
	F2	Route Output Connectors	Displays the Output Connectors function menu to set the output signals. Refer to 7.4.2 "Route Output Connectors".

Table 7.4-1 Route Connectors Function Menu

7.4.1 Route Input Connectors

Top>>>>>Route Connectors>Route Input Connectors

Sets signals input to input connectors displayed on the menu. Press **F1 Route Input Connectors** on the Route Connectors function menu to display the Input Connectors function menu.

Page	Key No.	Menu Display	Function
1	F1	S/F Trigger	Selects the signal input to the Start/Frame Trigger Input connector.
	F2	Pattern Trigger 1	Selects the signal input to the Pattern Trigger 1 Input connector.
	F3	Pattern Trigger 2	Selects the signal input to the Pattern Trigger 2 terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.
	F4	Pattern Trigger 3	Selects the signal input to the Pattern Trigger 3 terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.
	F5	Pattern Status 1	Selects the signal input to the Pattern Status 1 terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.
	F6	Pulse Mod	Selects the signal input to the Pulse Mod terminal of AUX connector.
	F7	Pattern Trigger Type <u>Shared</u> Ind	Sets the usage of PatternTrigger 1, 2, 3, and PatternStatus1. This is available in MG3740A only when option-020/120 is installed.

Table 7.4.1-1 Input Connectors Function Menu

Setting each input connector

Top> > Route Connectors> Route Input Connectors> F1 to F6

Press **F1** to **F6** on the Input Connectors function menu to display the Input Connectors function menu.

You can set signals in the table below regardless of names of input connectors.

Table 7.4.1-2 Input Connector Function Menu (MG3710A, MG3710E, MG3740A installed option-020/120)

Page	Key No.	Menu Display	Function
1	F1	SG1 S/F Trigger	Handles the input signal as S/F Trigger for SG1. Refer to 7.3.8 "Start/Frame Trigger".
	F2	SG2 S/F Trigger	Handles the input signal as S/F Trigger for SG2. This is displayed when option-062/064/066/ 162/164/166 is installed. Refer to 7.3.8 "Start/Frame Trigger".
	F3	Pattern Trigger 1	Handles the input signal as Pattern Trigger 1/Point Trigger. Refer to 7.3.14 "Pattern Trigger". Refer to 6.5 "Point Trigger".
	F4	Pattern Trigger 2	Handles the input signal as Pattern Trigger 2/Pattern Status 2. Refer to 7.3.14 "Pattern Trigger".
	F5	Pattern Trigger 3	Handles the input signal as Pattern Trigger 3/Pattern Status 3. Refer to 7.3.14 "Pattern Trigger".
	F6	Pattern Status 1	Handles the input signal as Pattern Status 1. Refer to 7.3.14 "Pattern Trigger".
	F7	SG1 Pulse Mod	Handles the input signal as SG1 Pulse Mod. Menu Display is Pulse Mod when option-062/064/066/ 162/164/166 is not installed. Refer to 7.2.3 "Pulse".
	F8	SG2 Pulse Mod	Handles the input signal as SG2 Pulse Mod. This is displayed when option-062/064/066/ 162/164/166 is installed. Refer to 7.2.3 "Pulse".
2	F1	Off	Does not use the input signal.

Page	Key No.	Menu Display	Function
1	F1	Off	Does not use the input signal.
	F3	Detterne Thismen 1	Handles the input signal as Pattern Trigger 1/Point Trigger.
		Pattern Trigger 1	Refer to 7.3.14 "Pattern Trigger". Refer to 6.5 "Point Trigger".
	F7		Handles the input signal as SG1 Pulse Mod.
		SG1 Pulse Mod	Menu Display is [Pulse Mod] when option-062/064/066/162/164/166 is installed.
			Refer to 7.2.3 "Pulse".
	F8		Handles the input signal as SG2 Pulse Mod.
		SG2 Pulse Mod	This is displayed when option-062/064/066/ 162/164/166 is installed.
			Refer to 7.2.3 "Pulse".

Table 7.4.1-3 Input Connector Function Menu (MG3740A not installed option-020/120)

S/F Trigger

Top> > Route Connectors> Route Input Connectors> S/F Trigger

Selects the signal input to the S/F Trigger connector.

Press **F1 S/F Trigger** in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.

Options Listed in Table 7.4.1-2 "Input Connector Function Menu". Default SG1 S/F Trigger (MG3710A, MG3710E, MG3740A-020/120) OFF (MG3740A, when MG3740A-020/120 is not installed)

Remote command Select the signal input to the S/F Trigger connector Command :ROUTe[:CONNectors]:INPut:TRIGger:SFRame

SFT | SG2SFT | PT1 | PT2 | PT3 | PS1 | PM | SG2PM | OFF

Query

:ROUTe[:CONNectors]:INPut:TRIGger:SFRame?

Response

<signal>

<signal> Options Signal input to the S/F Trigger connector Refer to the table below.

 Table 7.4.1-4
 Input Connector

Parameter	Signal to be input	Remarks
SFT	SG1 S/F Trigger	Default (MG3710A, MG3710E, MG3740A-020/120) In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2SFT	SG2 S/F Trigger	In MG3740A, this cannot be selected when option-020/120 is not installed.
PT1	Pattern Trigger 1 /Point Trigger	
PT2	Pattern Trigger 2 /Pattern Status 2	In MG3740A, this cannot be selected when option-020/120 is not installed.
PT3	Pattern Trigger 3 /Pattern Status 3	In MG3740A, this cannot be selected when option-020/120 is not installed.
PS1	Pattern Status 1	In MG3740A, this cannot be selected when option-020/120 is not installed.
PM	SG1 Pulse Mod	
SG2PM	SG2 Pulse Mod	
OFF	Off	Default (MG3740A when option-020/120 not installed)

Programming Example

To set the signal input to the S/F Trigger connector to SG1 S/F Trigger. ROUT:INP:TRIG:SFR SFT ROUT:INP:TRIG:SFR? > SFT

Pattern Trigger 1

Top>→>Route Connectors>Route Input Connectors>Pattern Trigger 1

Selects the signal input to the Pattern Trigger 1 connector. Press **F2 Pattern Trigger 1** in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.

Options Listed in Table 7.4.1-2 "Input Connector Function Menu". Default Pattern Trigger 1 (MG3710A, MG3710E, MG3740A-020/120) OFF (MG3740A, when option-020/120 not installed)

Remote command	Select the signal input to the Pattern Trigger 1 connector Command		
	:ROUTe[:CONNectors]:INPut:TRIGger:PATTern1		
	SFT SG2SFT	' PT1 PT2	2 PT3 PS1 PM SG2PM OFF
	Query		
	:ROUTe[:CO	NNectors	s]:INPut:TRIGger:PATTern1?
	Response		
	<signal></signal>		
	Parameter		
	<signal></signal>	Signal i	input to the Pattern Trigger 1 connector
	Options	Listed i	in Table 7.4.1-3 "Input Connector".
	Default	PT1	(MG3710A, MG3710E, MG3740A-020/120)
		OFF	(MG3740A, when option-020/120 not installed)
	Programmin	g Example	e
	-		to the Pattern Trigger 1 connector to SG1 S/F
	Trigger.	, 1	
	ROUT:INP:T	RIG:PATT	F1 SFT
	ROUT:INP:TRIG:PATT1? > SFT		F1?
Pattern Trigger 2			
	-	oute Conn	ectors>Route Input Connectors>Pattern Trigger
	2		
			t to the Pattern Trigger 2 connector.
	In MG3740A	, this can l	be selected only when option-020/120 is installed.
	Press F3 Pattern Trigger 2 in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.		
	Options	0	Listed in Table 7.4.1-2 "Input Connector
			Function Menu".
	Default		Pattern Trigger 2

7.4 Route Connectors

Remote command	Command		
	:ROUTe[:CONNectors]:INPut:TRIGger:PATTern2		
	SFT SG2SFT PT1 PT2 PT3 PS1 PM SG2PM OFF		
	Query		
	:ROUTe[:CONNectors]:INPut:TRIGger:PATTern2?		
	Response		
	<signal></signal>		
	Parameter		
	<signal></signal>	Signal input to the Pattern Trigger 2 connector	
	Options	Listed in Table 7.4.1-3 "Input Connector".	
	Default	PT2	
	Programming Example		
	To set the signal input to the Pattern Trigger 2 connector to SG1 S/F		
	Trigger.		
	ROUT:INP:TRIG:PATT2 SFT		
	ROUT: INP: TRIG: PATT2?		
	> SFT		
Pattern Trigger 3			
r allern mgger 5	Top> >Route Connector>Route Input Connectors>Pattern Trigger 3		
	Selects the signal input to the Pattern Trigger 3 connector. In MG3740A, this can be selected only when option-020/120 is installed.		
	Press F4 Pattern Trigger 3 in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.		
	Options	Listed in Table 7.4.1-2 "Input Connector Function Menu".	
	Default	Pattern Trigger 3	
Pomoto commond	Salaat the signs	Linnut to the Dettern Trigger 2 connector	
Remote command	-	I input to the Pattern Trigger 3 connector	
	:ROUTe[:CONNectors]:INPut:TRIGger:PATTern3 SFT SG2SFT PT1 PT2 PT3 PS1 PM SG2PM OFF		
	Query		
	:ROUTe[:CONNectors]:INPut:TRIGger:PATTern3?		

Select the signal input to the Pattern Trigger 2 connector

Remote command

	Response <signal></signal>			
	Parameter			
	<signal></signal>	Signal input to the Pattern Trigger 3 connector		
	Options	Listed in Table 7.4.1-3 "Input Connector".		
	Default	PT3		
	Programming Example			
	To set the signal input to the Pattern Trigger 3 connector to SG1 S/F			
	Trigger.			
	ROUT:INP:TRIG:PATT3 SFT			
	ROUT:INP:TRIG:PATT3?			
	> SFT			
Pattern Status 1				
	Top> >Route Connectors>Route Input Connectors>Pattern Status 1			
	Selects the signal input to the Pattern Status 1 connector.			
	In MG3740A, this ca	In MG3740A, this can be selected only when option 020/120 is installed.		
	Press F5 Pattern Status 1 in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.			
	Options	Listed in Table 7.4.1-2 "Input Connector		
	-	Function Menu".		
	Default	Pattern Status 1		
Remote command	Select the signal input to the Pattern Status 1 connector Command			
	:ROUTe[:CONNecto	rs]:INPut:STATus:PATTern1		
	SFT SG2SFT PT1 PT2 PT3 PS1 PM SG2PM OFF			
	Query :ROUTe[:CONNectors]:INPut:STATus:PATTern1? Response			
	<signal></signal>			
	Parameter			
	<signal></signal>	Signal input to the Pattern Status 1 connector		
	Options	Listed in Table 7.4.1-3 "Input Connector".		
	Default	PS1		

	Programming Examp To set the signal input Trigger. ROUT:INP:STAT:PAT ROUT:INP:STAT:PAT > SFT	t to the Pattern Status 1 connector to SG1 S/F	
Pulse Mod			
	Top>→>Route Connectors>Route Input Connectors>Pulse Mod Selects the signal input to the Pulse Mod connector. Press F6 Pulse Mod in Table 7.4.1-1 "Input Connectors Function Menu" to select the signal.		
	Options	Listed in Table 7.4.1-2 "Input Connector Function Menu".	
	Default	SG1 Pulse Mod (When option-062/064/066/162/164/166 is installed.) Pulse Mod (When option-062/064/066/162/164/166 is not installed.)	
Remote command	Select the signal inpu Command	t to the Pulse Mod connector	
	:ROUTe[:CONNectors]:INPut:PLUM		
	SFT SG2SFT PT1 PT	2 PT3 PS1 PM SG2PM OFF	
	Query :ROUTe[:CONNectors]:INPut:PLUM?		
	Response		
	<signal></signal>		
	Parameter		
	Parameter		
	Parameter <signal></signal>	Signal input to the Pulse Mod connector	
	<signal> Options</signal>	Listed in Table 7.4.1-3 "Input Connector".	
	<signal></signal>		
	<signal> Options</signal>	Listed in Table 7.4.1-3 "Input Connector". PM	
	<signal> Options Default Programming Examp</signal>	Listed in Table 7.4.1-3 "Input Connector". PM le t to the Pulse Mod connector to SG1 S/F Trigger.	

Pattern Trigger Type

Top>→>Route Connectors>Route Input Connectors>Pattern Trigger Type

Selects the usage of PatternTrig1, 2, 3, and PatternStatus1. In MG3740A, this can be selected only when option-020/120 is installed.

Press **F7 Pattern Trigger Type** on the Input Connectors function menu to select the usage.

SharedPatternTrig1,2,3 and PatternStatus1 are
handled as the same signal in SG1/2. This is
used when the sequence mode is controlled with
all control signals of PatterTrig1,2,3 and
PatternStatus1, or when the sequence mode of
SG1 and SG2 are synchronized for operation
(Default).Ind (Independent)PatternTrig1,2 are handled as PatternTrig1,2 for
SG1, and PatternTrig3 and PatternStatus1 are
handled as PatternTrig1,2 for SG2. This is used
when the sequence mode is operated in SG1/2
independently.

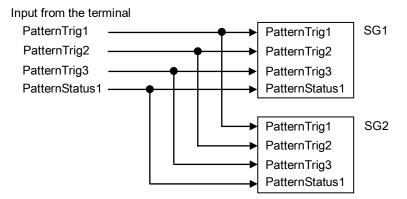
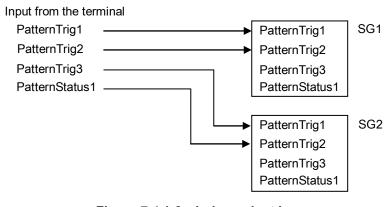


Figure 7.4.1-1 Shared Image





7.4 Route Connectors

Remote command

Select the usage of PatternTrig1, 2, 3, and PatternStatus1 Command

:ROUTe[:CONNectors]:INPut:TRIGger:PATTern:TYPE SHARe|DIVide

Query

:ROUTe[:CONNectors]:INPut:TRIGger:PATTern:TYPE?

Response

<mode>

SHAR or DIV

Parameter

<mode> SHARe DIVide Usage of PatternTrig 1, 2, 3, and PatternStatus1 Shared (Default) Independent

Programming Example

To set the usage of PatternTrig 1, 2, 3 and PatternStatus1 to Independent. ROUT:INP:TRIG:PATT:TYPE DIV ROUT:INP:TRIG:PATT:TYPE? > DIV

7.4.2 Route Output Connectors

Top> > Route Connectors> Route Output Connectors

Sets signals output from output connectors displayed on the menu.

Press **F2 Route Output Connectors** on the Route Connectors function menu to display the Output Connectors function menu.

Page	Key No.	Menu Display	Function
1	F1	Marker 1	Sets the signal output from the Marker 1 Output connector.
	F2	Marker 2	Sets the signal output from the Marker 2 terminal of AUX connector.
		Marker 2	This is available in MG3740A only when option-020/120 is installed.
	F3	Marker 3	Sets the signal output from the Marker 3 terminal of AUX connector.
		Marker 5	This is available in MG3740A only when option-020/120 is installed.
	F4	Pulse Video	Sets the signal output from the Pulse Video terminal of AUX connector.
	F5	Pulse Sync	Sets the signal output from the Pulse Sync terminal of AUX connector.
	F6	Suma Traig Out	Sets the signal output from the Sync Trig Out terminal of AUX connector.
		Sync Trig Out	This is available in MG3740A only when option-020/120 is installed.

Table 7.4.2-1 Output Connectors Function Menu

Setting each output connector

Top> > Route Connectors > Route Output Connectors > F1 to F6

Press **F1** to **F6** on the Output Connectors function menu to display the Marker Connectors function menu.

You can set signals in the table below regardless of names of output connectors.

Table 7.4.2-2 Marker Connector Function Menu (MG3710A, MG3710E, MG3740A installed option-020/120)

Page	Key No.	Menu Display	Function
1	F1	SG1 Marker 1 A	Outputs SG1 Waveform Memory A side Marker 1 signal. Refer to 7.3.12 "Marker Setup".
	F2	SG1 Marker 2 A	Outputs SG1 Waveform Memory A side Marker 2 signal. Refer to 7.3.12 "Marker Setup".
	F3	SG1 Marker 3 A	Outputs SG1 Waveform Memory A side Marker 3 signal. Refer to 7.3.12 "Marker Setup".
	F4	SG1 Marker 1 B	Outputs SG1 Waveform Memory B side Marker 1 signal. This is not displayed when the option 048/148 is not installed.
	F5		Refer to 7.3.12 "Marker Setup". Outputs SG1 Waveform Memory B side Marker 2 signal.
		SG1 Marker 2 B	This is not displayed when the option 048/148 is not installed.
			Refer to 7.3.12 "Marker Setup".
	F6		Outputs SG1 Waveform Memory B side Marker 3 signal.
		SG1 Marker 3 B	This is not displayed when the option 048/148 is not installed.
			Refer to 7.3.12 "Marker Setup".
	F7	SG1 Pulse Sync	Outputs the signal synchronized with SG1 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3710E/MG3740A is to be executed. Refer to Figure 7.4.2-3 "SG1/2 Pulse Sync" and 7.2.3 "Pulse"
	F8	SG1 Pulse Video	Outputs the signal synchronized with SG1 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3710E/MG3740A is to be executed. Refer to Figure 7.4.2-4 "SG1/2 Pulse Video" and 7.2.3 "Pulse".

Page	Key No.	Menu Display	Function
2	F1	SG1 Settled	Outputs the settling signal of SG1. This is used when the measurement synchronized with the signal transmission after frequency switching or others of the MG3710A/MG3710E/MG3740A is to be executed. Refer to Figure 7.4.2-5 "SG1/2 Source Settled".
	F2	Sync Trigger Out	Outputs the trigger signal for synchronization for multiple SGs. This is used for output waveforms of multiple signal generators to be synchronized with Start/Frame Trigger input to the MG3710A/MG3710E/MG3740A.
			Refer to Figure 7.4.2-1 "Sync Trigger Out".
	F3	Pattern Trigger 1 Out	Outputs Pattern Trigger 1 signal. This is used for output waveforms of multiple signal generators to be synchronized with Pattern Trigger 1 input to the MG3710A/MG3710E/MG3740A.
			Refer to 7.3.14 "Pattern Trigger".
	F4	Pattern Trigger 2 / Pattern Status 2	Outputs Pattern Trigger 2/Pattern Status 2 signal. This is used for output waveforms of multiple signal generators to be synchronized with Pattern Trigger 2/Pattern Status 2 input to the MG3710A/MG3710E/MG3740A.
			Refer to 7.3.14 "Pattern Trigger".
	F5	Pattern Trigger 3 / Pattern Status 3	Outputs Pattern Trigger 3/Pattern Status 3 signal. This is used for output waveforms of multiple signal generators to be synchronized with Pattern Trigger 3/Pattern Status 3 input to the MG3710A/MG3710E/MG3740A.
			Refer to 7.3.14 "Pattern Trigger".
	F6	Pattern Status 1	Outputs Pattern Status 1 signal. This is used for output waveforms of multiple signal generators to be synchronized with Pattern Status 1 input to the MG3710A/MG3710E/MG3740A. Refer to 7.3.14 "Pattern Trigger".
	F7		Outputs Point Trigger signal. This is used for
		Point Trigger	measurement synchronized with Sweep/List function. Refer to Figure 7.4.2-2 "Point Trigger Out" and 6.5 "Point Trigger".
	F8	SG2 Marker 1 A	Outputs SG2 Waveform Memory A side Marker 1 signal. This is not displayed when the option 062/162, 064/164 or 066/166 is not installed.
			Refer to 7.3.12 "Marker Setup".

Table 7.4.2-2Marker Connector Function Menu(MG3710A, MG3710E, MG3740A installed option-020/120 (Cont'd)

Key Page Menu Display Function No. 3 F1Outputs SG2 Waveform Memory A side Marker 2 signal. This is not displayed when the option 062/162, 064/164SG2 Marker 2 A or 066/166 is not installed. Refer to 7.3.12 "Marker Setup". F2Outputs SG2 Waveform Memory A side Marker 3 signal. This is not displayed when the option 062/162, 064/164SG2 Marker 3 A or 066/166 is not installed. Refer to 7.3.12 "Marker Setup". F3Outputs SG2 Waveform Memory B side Marker 1 signal. This is not displayed when the option 078/178 is not SG2 Marker 1 B installed. Refer to 7.3.12 "Marker Setup". F4Outputs SG2 Waveform Memory B side Marker 2 signal. This is not displayed when the option 078/178 is not SG2 Marker 2 B installed. Refer to 7.3.12 "Marker Setup". F5Outputs SG2 Waveform Memory B side Marker 3 signal. This is not displayed when the option 078/178 is not SG2 Marker 3 B installed. Refer to 7.3.12 "Marker Setup". F6 Outputs the signal synchronized with SG2 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3710E/MG3740A is to be executed. SG2 Pulse Sync This is not displayed when the option 062/162, 064/164or 066/166 is not installed. Refer to Figure 7.4.2-3 "SG1/2 Pulse Sync" and 7.2.3 "Pulse". F7Outputs the signal synchronized with SG2 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3710E/MG3740A is to be executed. SG2 Pulse Video This is not displayed when the option 062/162, 064/164or 066/166 is not installed. Refer to Figure 7.4.2-4 "SG1/2 Pulse Video" and 7.2.3 "Pulse". Outputs the settling signal of SG2. This is used when the F8 measurement synchronized with the signal transmission after frequency switching or others of the MG3710A/MG3710E/MG3740A is to be executed. SG2 Settled This is not displayed when the option 062/162, 064/164or 066/166 is not installed. Refer to Figure 7.4.2-5 "SG1/2 Source Settled".

Table 7.4.2-2Marker Connector Function Menu(MG3710A, MG3710E, MG3740A installed option-020/120 (Cont'd)

Page	Key No.	Menu Display	Function
1	F1	SG1 Pulse Sync	Outputs the signal synchronized with SG1 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3740A is to be executed. Refer to Figure 7.4.2-3 "SG1/2 Pulse Sync" and 7.2.3 "Pulse"
	F2	SG1 Pulse Video	Outputs the signal synchronized with SG1 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3740A is to be executed. Refer to Figure 7.4.2-4 "SG1/2 Pulse Video"
	F3	SG1 Settled	and 7.2.3 "Pulse". Outputs the settling signal of SG1. This is used when the measurement synchronized with the signal transmission after frequency switching or others of the MG3740A is to be executed. Refer to Figure 7.4.2-5 "SG1/2 Source Settled".
		Point Trigger	Outputs Point Trigger signal. This is used for measurement synchronized with Sweep/List function. Refer to Figure 7.4.2-2 "Point Trigger Out" and 6.5 "Point Trigger".
	F5	SG2 Pulse Sync	Outputs the signal synchronized with SG2 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3740A is to be executed. This is not displayed when the option 062/162, 064/164 or 066/166 is not installed. Refer to Figure 7.4.2-3 "SG1/2 Pulse Sync"
	F6	SG2 Pulse Video	and 7.2.3 "Pulse". Outputs the signal synchronized with SG2 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3740A is to be executed. This is not displayed when the option 062/162, 064/164 or 066/166 is not installed. Refer to Figure 7.4.2-4 "SG1/2 Pulse Video" and 7.2.3 "Pulse".
	F7	SG2 Settled	Outputs the settling signal of SG2. This is used when the measurement synchronized with the signal transmission after frequency switching or others of the MG3740A is to be executed. This is not displayed when the option 062/162, 064/164 or 066/166 is not installed. Refer to Figure 7.4.2-5 "SG1/2 Source Settled".

Table 7.4.2-3 Marker Connector Function Menu (MG3740A not installed option-020/120)

SG1/2 Marker 1A to 3A: Output level is TTL.

Outputs the waveform pattern-defined marker signal or user-defined marker signal.

SG1/2 Marker 1B to 3B: Output level is TTL.

Outputs the waveform pattern-defined marker signal or user-defined marker signal.

Sync Trigger Out: Output level is TTL.

Sends the trigger signal input as S/F Trigger to DFF circuit and outputs the signal at the timing of synchronization with Baseband Reference Clock Out falling.

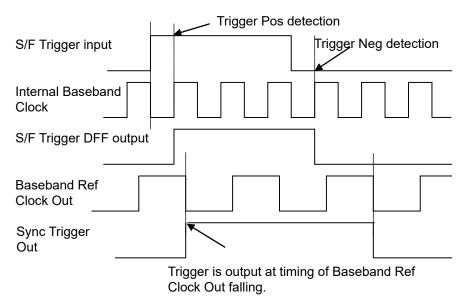


Figure 7.4.2-1 Sync Trigger Out

Pattern Trigger 1 Out, Pattern Trigger 2 / Pattern Status 2 Out, Pattern Trigger 3 / Pattern Status 3 Out: Output level is TTL.

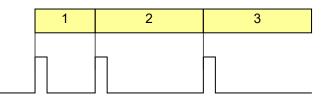
This is same as Sync Trigger Source Out.

Point Trigger Out:

Outputs the signal at the timing of switching of Sweep/List function sweep point.

Output level is TTL.

Sweep/List signal

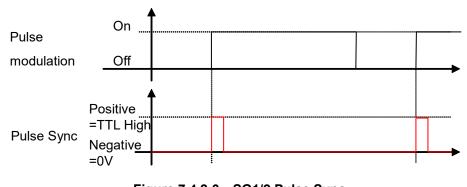


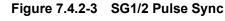
Point Trigger Out

Figure 7.4.2-2 Point Trigger Out

SG1/2 Pulse Sync: Output level is TTL.

Outputs the signal synchronized with the start position of the pulse modulation cycle.





SG1/2 Pulse Video: Output level is TTL.

Outputs the signal synchronized with the modulated signal of the pulse modulation.

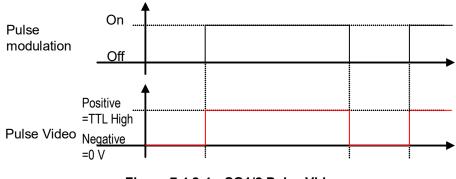


Figure 7.4.2-4 SG1/2 Pulse Video

SG1/2 Settled: Output level is TTL

Outputs the signal synchronized with the settling of SG1/2. "Settling" indicates the status where the signal transmission is being prepared with switching of the frequency or waveform data.

Example:

- During Cal
- When signals are not being output due to digital delay

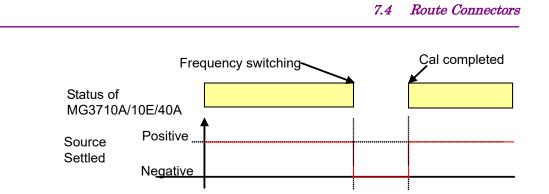


Figure 7.4.2-5 SG1/2 Source Settled

Marker 1 connector: Marker 1

	Top> Route Connectors>Route Output Connectors>Marker 1 Selects the signal output from the Marker 1 connector. Press F1 Marker 1 on the Output Connectors function menu to select the signal.			
	Options	Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	SG1 Marker 1 A (MG3710A, MG3710E, MG3740A-020/120) Point Trigger Out (MG3740A, when MG3740A-020/120 is not installed)		
Remote command	Select the signal output from the Marker 1 connector Command			
	:ROUTe[:CONNectors]:OUTPut:MARKer1			
	M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B SG2M			
	3A SG2M3B SYNC PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVID SG2			
	PVID SET SG2SET			
	Query			
	:ROUTe[:CONNectors]:OUTPut:MARKer1?			
	Response			
	<mode></mode>			
	Parameter			
	<mode></mode>	Signal to be output		
	Options	Refer to the table below.		

Parameter	Signal to be output	Remarks
M1A	SG1 Marker 1 A	Default (MG3710A, MG3710E, MG3740A-020/120) In MG3740A, this cannot be selected
		when option-020/120 is not installed.
M2A	SG1 Marker 2 A	In MG3740A, this cannot be selected when option-020/120 is not installed.
МЗА	SG1 Marker 3 A	In MG3740A, this cannot be selected when option-020/120 is not installed.
M1B	SG1 Marker 1 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
M2B	SG1 Marker 2 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
M3B	SG1 Marker 3 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
PSY	SG1 Pulse Sync	
PVID	SG1 Pulse Video	
SET	SG1 Settled	
SYNC	Sync Trigger Out	In MG3740A, this cannot be selected when option-020/120 is not installed.
PT1	Pattern Trigger 1 Out	In MG3740A, this cannot be selected when option-020/120 is not installed.
PT2	Pattern Trigger 2 / Pattern Status 2	In MG3740A, this cannot be selected when option-020/120 is not installed.
PT3	Pattern Trigger 3 / Pattern Status 3	In MG3740A, this cannot be selected when option-020/120 is not installed.
PS1	Pattern Status 1	In MG3740A, this cannot be selected when option-020/120 is not installed.
POINT	Point Trigger	Default (MG3740A when option-020/120 is not installed)
SG2M1A	SG2 Marker 1 A	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2M2A	SG2 Marker 2 A	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2M3A	SG2 Marker 3 A	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2M1B	SG2 Marker 1 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2M2B	SG2 Marker 2 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2M3B	SG2 Marker 3 B	In MG3740A, this cannot be selected when option-020/120 is not installed.
SG2PSY	SG2 Pulse Sync	
SG2PVID	SG2 Pulse Video	
SG2SET	SG2 Settled	

Table 7.4.2-4	Marker Connector

	Programming Example To set the signal output from the Marker 1 connector to SG1 Marker 1 A. ROUT:OUTP:MARK1 M1A ROUT:OUTP:MARK1? > M1A		
Marker 2 connector: Mar	ker 2		
	Top>→>Route Connectors>Route Output Connectors>Marker 2 Selects the signal output from the Marker 2 connector. In MG3740A, this can be selected only when option-020/120 is installed.		
	Press F2 Marker 2 on the Output Connectors function menu to select the signal.		
	Options Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	SG1 Marker 2 A	
Remote command	<pre>hd Select the signal output from the Marker 2 connector Command :ROUTe[:CONNectors]:OUTPut:MARKer2 M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B 3A SG2M3B SYNC PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVIE PVID SET SG2SET Query :ROUTe[:CONNectors]:OUTPut:MARKer2?</pre>		
	Response <mode></mode>		
	Parameter		
	<mode></mode>	Signal to be output	
	Options Default	Listed in Table 7.4.2-4 "Marker Connector". M2A	
	Programming Example To set the signal output ROUT:OUTP:MARK2 MI ROUT:OUTP:MARK2? > M1A	t from the Marker 2 connector to SG1 Marker 1 A.	

Marker 3 connector: Marker 3

irker 3 connector: Ma	arker 3			
	• —	e Connectors>Route Output Connectors>Marker 3 al output from the Marker 3 connector.		
	In MG3740A, th	In MG3740A, this can be selected only when option-020/120 is installed.		
	Press F3 Marker 3 on the Output Connectors function menu to select the signal.			
	Options	Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	SG1 Marker 3 A		
Remote command	Select the signal output from the Marker 3 connector			
	Command			
	:ROUTe[:CONNectors]:OUTPut:MARKer3			
	M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B SG2M			
	3A SG2M3B SYNC PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVID SG2			
	PVID SET SG2SET			
	Query			
	:ROUTe[:CONNe	ectors]:OUTPut:MARKer3?		
	Response			
	<mode></mode>			
	Parameter			
	<mode></mode>	Signal to be output		
	Options	Listed in Table 7.4.2-4 "Marker Connector".		

МЗА

Programming Example

Default

To set the signal output from the Marker 3 connector to SG1 Marker 1 A. ROUT:OUTP:MARK3 M1A ROUT:OUTP:MARK3? > M1A

Pulse Video				
	Top> > Route Connectors> Route Output Connectors> Pulse Video Selects the signal output from the Pulse Video connector. Press F4 Pulse Video on the Output Connectors function menu to select the signal.			
	Options	Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	SG1 Pulse Video		
Remote command	Select the signal output from the Pulse Video connector Command			
	:ROUTe[:CONNecto	ors]:OUTPut:PULSe:VIDeo		
	M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B SG2M			
		PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVID SG2		
	PVID SET SG2SET			
	Query			
	:ROUTe[:CONNectors]:OUTPut:PULSe:VIDeo?			
	Response			
	<mode></mode>			
	Parameter			
	<mode></mode>	Signal to be output		
	Options	Listed in Table 7.4.2-4 "Marker Connector".		
	Default	PVID		
	Programming Example			
	To set the signal output from the Pulse Video connector to SG1 Ma A. ROUT:OUTP:PULS:VID M1A			
	ROUT:OUTP:PULS:	/ID?		
	> M1A			

Pulse

lse Sync				
-	Top> Route Connectors>Route Output Connectors>Pulse Sync Selects the signal output from the Pulse Sync connector. Press F5 Pulse Sync on the Output Connectors function menu to select the signal.			
	Options	Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	SG1 Pulse Sync		
Remote command	Select the signal output from the Pulse Sync connector			
	Command :ROUTe[:CONNectors]:OUTPut:PULSe:SYNC M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B SG2M 3A SG2M3B SYNC PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVID SG2 PVID SET SG2SET			
	Query :ROUTe[:CONNectors]:OUTPut:PULSe:SYNC?			
	Response <mode></mode>			
	Parameter <mode> Options</mode>	Signal to be output Listed in Table 7.4.2-4 "Marker Connector".		
	Default	PSY		
	Programming E To set the signal A. ROUT:OUTP:PU	l output from the Pulse Sync connector to SG1 Marker 1		

ROUT:OUTP:PULS:SYNC?

> M1A

7-226

Sync Trig Out	Top>⊖>Route	Connectors>Route Output Connectors>Sync Trig Out		
		output from the Sync Trig Out connector. s can be selected only when option-020/120 is installed.		
	Press F6 Sync Trig Out on the Output Connectors function menu to select the signal.			
	Options	Listed in Table 7.4.2-2 "Marker Connector Function Menu".		
	Default	Sync Trigger Out		
Remote command	Select the signal output from the Sync Trig Out connector Command			
	:ROUTe[:CONNectors]:OUTPut:SYNC			
	M1A M1B M2A M2B M3A M3B SG2M1A SG2M1B SG2M2A SG2M2B SG2M			
	3A SG2M3B SYNC PT1 PT2 PT3 PS1 POINT PSY SG2PSY PVID SG2			
	PVID SET SG2SET			
	Query			
	:ROUTe[:CONNectors]:OUTPut:SYNC?			
	Response			
	<mode></mode>			
	Parameter			
	<mode></mode>	Signal to be output		
	Options	Listed in Table 7.4.2-4 "Marker Connector".		
	Default	SYNC		
	Programming Example			
	To set the signal of	output from the Sync Trig Out connector to SG1 Marker		
	1 A.			
	ROUT:OUTP:SYNC M1A			
	ROUT:OUTP:SYNC	2?		
	> MIA			

7.5 AWGN

Top>→>AWGN

Executes the digital-addition of AWGN signal for the selected waveform pattern.

This can be used when AWGN option

(MG3710A/MG3710E-049/079/149/179) is installed. This cannot be used in MG3740A.

Notes:

- The AWGN function cannot be used when a waveform pattern is not selected.
- If you want to use AWGN only, generate it by using IQproducer.

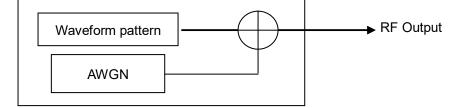


Figure 7.5-1 AWGN Addition Function

Press **F1 AWGN** on page 2 of the top function menu to open the AWGN function menu.

Table 7.5-1	AWGN	Function	Menu
	-		

Page	Key No.	Menu Display	Function
1	F1	AWGN	Enables/disables the AWGN.
		<u>Off</u> On	
	F2	Noise Bandwidth	Sets the bandwidth of AWGN.
		$128.000000 \mathrm{~MHz}$	
	F3	Carrier Level	Sets the carrier signal output level.
		-110.00 dBm	
	F4	Noise Level	Sets the noise level of the noise bandwidth conversion
		–20.00 dBm	when no carrier exists, and sets the noise level of the carrier bandwidth conversion when the carrier exists.
	F5	C/N Ratio	Sets the in-band Noise Power with the ratio to Carrier
		40.00 dB	Power when AWGN is added.
	F6	C/N Set Signal	Sets the target for level change on CN Ratio
		Carrier	change.(The option which is not selected is fixed.)

AWGN On/Off: AWGN	AWGN	On/Off:	AWGN
-------------------	------	---------	------

Top>>>>AWGN>AWGN

Enables/disables the AWGN addition. Press **F1 AWGN** on the AWGN function menu to set On/Off.

On	Outputs AWGN.
Off	Does not output AWGN (Default).

The signal with AWGN added is output when AWGN is On. While the combination of baseband signal (A+B) is being executed, the AWGN cannot be set to On.

Remote command

Enable/disable AWGN

Command

[:SOURce[1]|2]:RADio:ARB:NOISe[:STATe] <boolean>

Query

[:SOURce[1]|2]:RADio:ARB:NOISe[:STATe]?

Response

<boolean> 0 or 1

Parameter

<boolean> ON|1 OFF|0 AWGN output On/Off On Off

Details

The signal with AWGN added is output when AWGN is On. While the combination of baseband signal (A+B) is being executed, the AWGN cannot be set to On.

Programming Example

To add AWGN to the output signal. RAD:ARB:NOIS ON RAD:ARB:NOIS? > 1

Noise Bandwidth

Top> > AWGN> Noise Bandwidth

Sets the bandwidth of AWGN.

Press **F2 Noise Bandwidth** on the AWGN function menu to set with the **Noise Bandwidth** dialog box.

Range

See table below.

Note:

The table below describes the setting range when it is output with single AWGN.

Output waveform status	Upper limit	Lower limit
A, A + AWGN, Long, Long + Awgn	Sampling Rate A × 0.8	Sampling Rate A × 0.2
B, A + B, Awgn, CW No Signal, B + Awgn Multi	Sampling Rate B × 0.8	Sampling Rate B × 0.2
$\frac{\text{Seq (A), Seq (A + B)}}{\text{Seq (A + Awgn)}}$	16 kHz to 160 MHz	16 kHz to 160 MHz

Table 7.5-2 AWGN Noise Bandwidth

Resolution1 HzDefault128 MHz

This parameter indicates the bandwidth of the flat part.

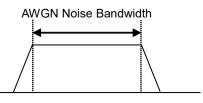


Figure 7.5-2 AWGN Noise Bandwidth

Remote command

Set the bandwidth of AWGN

Command

[:SOURce[1]|2]:RADio:ARB:NOISe:BANDWidth <freq>

Query

[:SOURce[1]|2]:RADio:ARB:NOISe:BANDWidth?

Response

<freq>

Unit: Hz

Parameter

<freq></freq>	Frequency
Range	Refer to Table 7.5-2.
Resolution	1 Hz
Default	$128 \mathrm{~MHz}$
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ
	When omitted: HZ

Programming Example

To set the bandwidth of AWGN to 10 MHz. RAD:ARB:NOIS:BANDW 10MHZ RAD:ARB:NOIS:BANDW? > 10000000

Carrier Level

Carrier Level			
	Top> AWGN > Carrier Level Sets the carrier signal output level.		
	$\mathrm{Press}\ \mathbf{F3}\ \mathbf{Carrier}\ \mathbf{I}$	_evel on the AWGN function menu to set with the	
	Carrier Level dialog box. Same value with Level A. When Level A is changed, also Carrier Level is		
	changed with the	same value. And vice versa.	
	Range	Output level range of MG3710A/MG3710E	
	Resolution	0.01 dB	
	Default	-110.00 dBm	
Remote command	Set the carrier sig	gnal output level	
	Command [:SOURce[1] 2]:RADio:ARB:NOISe:POWer:CARRier <ampl> Query</ampl>		
	[:SOURce[1] 2]	<pre>DURce[1] 2]:RADio:ARB:NOISe:POWer:CARRier?</pre>	
	Response		
	<ampl></ampl>	Unit: dBm	
	Parameter		
	<ampl></ampl>	Carrier signal level when AWGN is ON	
	Range	Output level range of MG3710A/MG3710E	
	Resolution	0.01 dB	
	Default	-110.00 dBm	
	Suffix code	DBM, DM, DBUV, DBUVE	
		When omitted: DBM	

Programming Example

To set the carrier signal level when AWGN is ON to -55.00 dBm. RAD:ARB:NOIS:POW:CARR -55 RAD:ARB:NOIS:POW:CARR? > -55.00

Noise Level

Top> >> AWGN>Noise Level

Sets the noise level of AWGN.

The noise level of the noise bandwidth conversion is set when no carrier exists, and the noise level of the carrier bandwidth conversion is set when the carrier exists.

Press **F4 Noise Level** on the AWGN function menu to set with the **Noise Level** dialog box.

Resolution	0.01 dB
Default	-20 dBm

The noise level of the noise bandwidth conversion is set when no carrier exists, and the noise level of the carrier bandwidth conversion is set when the carrier exists.

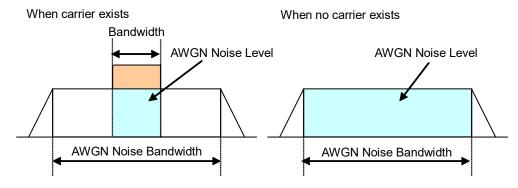


Figure 7.5-3 AWGN Noise Level

Remote command

Set the noise level of AWGN Command

[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:NOISe <ampl>

Query

[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:NOISe?

Response

<ampl>

Unit: dBm

Parameter

<ampl> Resolution Default Suffix code Output level 0.01 dB –20 dBm DBM, DM, DBUV, DBUVE When omitted: DBM

Programming Example

To set the AWGN noise level to -30.00 dBm. RAD:ARB:NOIS:POW:NOIS -30.00 RAD:ARB:NOIS:POW:NOIS? > -30.00

C/N Ratio

Top>>>>AWGN>C/N Ratio

Sets the ratio of in-band AWGN Noise Level to Carrier Level when AWGN is On.

Press **F5 C/N Ratio** on the AWGN function menu to set with the **C/N Ratio** dialog box.

Range Resolution Default -40 dB to 40 dB 0.01 dB 40 dB

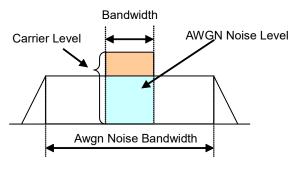


Figure 7.5-4 AWGN Noise Level

 Remote command
 Set the ratio of in-band AWGN Noise Level to Carrier Level when AWGN is On

 Command
 Command

 [:SOURce[1]|2]:RADio:ARB:NOISe:CN <rel_ampl>

 Query
 [:SOURce[1]|2]:RADio:ARB:NOISe:CN?

 Response

<rel_ampl>

Unit: dB

Parameter	
<rel_ampl></rel_ampl>	C/N
Range	$-40~\mathrm{dB}$ to $40~\mathrm{dB}$
Resolution	0.01
Default	40.00
Suffix code	DB, When omitted: DB

Details

When the RF output level is near the upper limit or lower limit, the settable range may become narrow.

Programming Example

To set the C/N to 3 dB. RAD:ARB:NOIS:CN 3DB RAD:ARB:NOIS:CN? > 3.00

C/N setting: C/N Set Signal

Top> > AWGN>C/N Set Signal

Sets the target for level change on C/N Ratio change.(The option which is not selected is fixed.)

 Press F6 C/N Set Signal on the AWGN function menu to set the target.

Carrier	Fixes Noise and changes Carrier.
Noise	Fixes Carrier and changes Noise.
Constant	Fixes the output level and changes Carrier and
	Noise (Default).

Remote command Set the target for level change on C/N Ratio change Command

[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:CONTrol[:MODE] TOTal|CARRier|NOISe

Query

[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:CONTrol[:MODE]?

Response

<mode>

TOT, CARR or NOIS

Parameter

<mode></mode>	Parameter to be changed
CARRier	Changes Carrier.
NOISe	Changes Noise.
TOTal	Fixes the output level and changes Carrier and
	Noise (Default).

Programming Example

To set the parameter to be changed when C/N is set to AWGN. RAD:ARB:NOIS:POW:CONT NOIS RAD:ARB:NOIS:POW:CONT? > NOIS

7.6 I/Q Modulation

or Top>→>I/Q

Sets the vector modulation with the external I/Q signal and correction, adjustment, and routing for the vector modulation.

In MG3740A, this can be used only when option-020/120 is installed.

Press $I\!/Q$ of the main function key or F2 $I\!/Q$ on page 2 of the top function menu to open the $I\!/Q$ function menu.

Page	Key No.	Menu Display	Function
1	F1	I/Q Source Internal	Sets the I/Q signal source. This is available in MG3710A/MG3710E only when option-018/118 is installed. This is not available in MG3740A.
	F2	I/Q Output RF	Sets the output destination for baseband signals. This is not available in MG3740A.
	F3	Internal Channel Correction <u>Off</u> On	Enables/disables the baseband in-band correction. This is not available in MG3740A.
	F5	I/Q Calibration	Displays the IQ Calibration function menu to set the settings related to I/Q quadrature modulator calibration. Refer to 7.6.1 "I/Q Calibration".
	F6	Wideband <u>Off</u> On	Selects the switching mode for RF output bandwidth. This is not available in MG3740A.
2	F1	Analog I/Q Input Adjustments	Displays the Analog I/Q Input function menu to adjust and set the analog I/Q input. This is available in MG3710A/MG3710E only when option-018/118 is installed. This is not available in MG3740A. Refer to 7.6.2 "Analog I/Q Input Adjustments".
	F2	Analog I/Q Output Adjustments	Displays the Analog I/Q Output function menu to adjust and set the analog I/Q output. This is available in MG3710A/MG3710E only when option-018/118 is installed. This is not available in MG3740A. Refer to 7.6.3 "Analog I/Q Output Adjustments".
	F3	Internal Baseband Adjustments	Displays the Internal Baseband Adjustments function menu to adjust the I/Q signal generated in the internal Baseband. Refer to 7.6.4 "Internal Baseband Adjustments".

Table 7.6-1 IQ Function Menu

I/Q Source	or Top> (→	∋I/Q. >I/Q Source	
	or Top> \rightarrow >I/Q, >I/Q Source Selects the I/Q signal source for the vector modulation with the external I/Q signal.		
	This can be used only when option-018/118 is installed in MG3710A/MG3710E. This cannot be used in MG3740A. Press F1 I/Q Source on the I/Q function menu to select from the I/Q Source function menu.		
	Internal	I/Q signal generated with the internal Baseband (Default).	
	Analog I/Q In	Signal input from Analog I/Q In connector (available only for SG1)	
		This is displayed when the option 018/118 is installed.	
	Internal is selected during Sweep/List execution.		
Remote command	Set the I/Q signal source Command		
	[:SOURce[1] 2]:DM:SOURce INTernal AEXTernal		
	Query		
	[:SOURce[1] 2]:DM:SOURce?		
	Response		
	<mode></mode>	INT or AEXT	
	Parameter		
	<mode></mode>	I/Q signal source	
	INTernal	Internal (Default)	
	AEXTernal	Analog I/Q In	
	Programming Example		
	To set the I/Q signal source to the I/Q signal generated with the internal		
	Baseband.		
	DM:SOUR INT		
	DM:SOUR?		
	> INT		

Operation description

The setting procedure for the vector modulation with the external I/Q signal is described below.

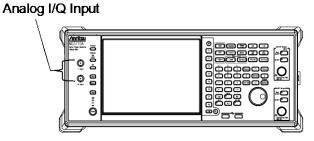


Figure 7.6-1 Analog I/Q Input Connector

The Analog I/Q Input connectors are internally terminated with 50 Ω . When the effective value voltage of $\sqrt{I^2 + Q^2}$ is 0.5 V in the 50 Ω termination status, RF signal that corresponds to the output level setting is output. Input the I/Q signal with 0.2 V of the effective value voltage of $\sqrt{I^2 + Q^2}$ when the vector modulation is actually executed. Also input the maximum I/Q signal within the range of ± 1 V for each.

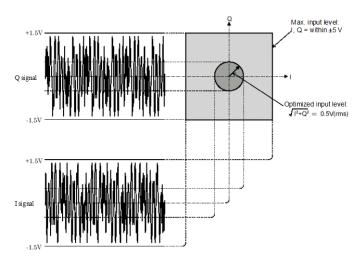


Figure 7.6-2 I/Q Signal Input Level

Example: To execute the vector modulation with the external I/Q signal.

 Press F1 I/Q Source on the I/Q function menu to switch F1 Internal to F2 Analog I/Q In. The display for "Src:" is switched to "Analog I/Q In" in the I/Q block in the figure below.



Figure 7.6-3 External I/Q Signal Input Status

2. Press onot of RF Output to set the RF output to On. Press Mod for to light the lamp (green) of the key to start the vector modulation. External input of "Analog I/Q In" is indicated between the I/Q block and the Pulse Mod block in the figure below. In addition, a line is displayed at the right side of the Pulse Mod block and it indicates that RF Output is On.



Figure 7.6-4 Modulation Status with External I/Q Signal

When the modulation is executed with the external I/Q signal and if the I/Q signal with $\sqrt{I^2 + Q^2} = 0.5$ V is input, the output level corresponds to the displayed level.

I/Q Output

\square or Top> \implies >I/Q, >I/Q Output

Can output the I/Q signal generated at the digital modulation unit from the I/Q signal output connector on the rear panel.

This cannot be used in MG3740A.

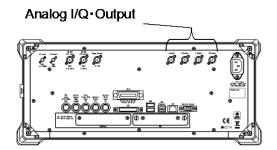


Figure 7.6-5 Analog I/Q Output Connector

Select the output destination for the Baseband signal.

Press F2 I/Q Output on the I/Q function menu to select from the I/Q Output function menu.

RF Analog I/Q Out RF terminal (Default)
Analog I/Q Out terminal (selectable only with SG1)
RF terminal output is CW.
This is displayed when the option 018/118 is installed.

Remote command

Set the output destination for baseband signals Command

[:SOURce[1]|2]:DM:OUTPut RFOut|AEXTernal

Query

[:SOURce[1]|2]:DM:OUTPut?

Response

<mode>

rfo or Aext

Parameter

<mode> RFOut AEXTernal

Baseband signal output destination RF terminal (Default) Analog I/Q Out

Programming Example

To set the output destination for baseband signals to Analog I/Q Out terminal. DM:OUTP AEXT DM:OUTP? > AEXT

Operation method Example: To output the I/Q signal from the I/Q signal output connector. *Note:*

When the power is turned on while the I/Q signal output is set to On, the DC voltage of +1 V is output for tens of microseconds during the power activation. Do not turn on the MG3710A/MG3710E while a low-voltage device or others are connected to the I/Q signal output.

1. Press F2 I/Q Output on the I/Q function menu to switch F1 RF to F2 Analog I/Q Out.

The display for "Out:" is switched to "Analog I/Q Out" in the I/Q block in the figure below.

2. Press did to light the lamp (green) of the key to start the vector modulation. External output of "Analog I/Q Out" is indicated between the I/Q block and the Pulse Mod block.



Figure 7.6-6 I/Q Signal Output Status

tion: Internal Channe	l Correction Q, Internal Channel Correction, or Cal	
Enables/disables the baseband in-band correction.		
This cannot be set in MG3740A.		
Press F3 Internal Channel Correction on the I/Q function menu to set the correction.		
Off Does not execute the baseband in-band correction (Default).		
On	Executes the baseband in-band correction.	
When it is set to On, the in-band flatness becomes better; however, the switching time for the frequency and pattern change becomes longer because the correction filter recalculation time and filter passing time become longer. If the in-band characteristics are not important, setting this function to Off allows the high-speed operation. When CW is output, this function has no effect.		
Enable/disable the baseband in-band correction Command		
[:SOURce[1] 2]:DM:INTernal:CHANnel:CORRection[:STATe] <boolean></boolean>		
Query		
[:SOURce[1] 2]:DM:INTernal:CHANnel:CORRection[:STATe]?		
Response		
<boolean></boolean>	0 or 1	
Parameter		
<boolean></boolean>	On/Off of the baseband in-band correction	
OFF 0	Does not execute the baseband in-band correction (Default).	
ON 1	Executes the baseband in-band correction.	
Programming Example To execute the baseband in-band correction.		
DM:INT:CHAN:CORR (NC	
DM:INT:CHAN:CORR? > 1		
	Image: Construction on the set of	

Baseband in-band correction: Wideband

Sebanu III-banu com				
	or Top>→>I/Q, >Wideband			
	Selects the switch	ects the switching mode for RF output bandwidth.		
	This cannot be us	ed in MG3740A.		
	Press F6 Widebar	Press F6 Wideband on the I/Q function menu to select the mode.		
	Off Harmonics distortion characteristic h (Default).			
	On	In-band flatness has priority. This function allows using the maximum modulation bandwidth with low frequency.(Harmonics cut filter has no effect.)		
	When CW is outp	ut, this function has no effect.		
Remote command	Enable/disable the wideband output			
		Command		
	[:SOURce[1] 2]:DM:WIDeband <boolean></boolean>			
	Query			
	[:SOURce[1] 2]:DM:WIDeband?			
	Response			
	<boolean></boolean>	0 or 1		
	Parameter			
	<boolean></boolean>	Wideband output switching mode On/Off		
	OFF 0	Does not execute the wideband output (Default).		
	ON 1	Executes the wideband output.		
	Programming Example			
	To execute the wideband output.			

DM:WID ON DM:WID? > 1

7.6.1 I/Q Calibration

or Top>→>I/Q, >I/Q Calibration, or Cal→>I/Q Cal

Sets the settings related to the I/Q quadrature modulator calibration.

Press F5 I/Q Calibration on the I/Q function menu to open the I/Q Calibration Info dialog box and I/Q Calibration function menu.



Figure 7.6.1-1 I/Q Calibration Info Dialog Box

Table 7.6.1-1	I/Q Calibration Function Menu
---------------	-------------------------------

Page	Key No.	Menu Display	Function
1	F1	Execute	Executes the calibration for the I/Q gain balance, origin offset, and I/Q quadrature angle.
	F2	Cal Type <u>DC</u> Full	Sets the calibration method for the I/Q calibration execution.
	F8	Restore Default	Returns the calibration value to factory setting status.

Execute Cal

or Top>>>I/Q, >I/Q Calibration>Execute

Executes the calibration for the I/Q gain balance, origin offset, and I/Q quadrature angle.

Press F1 Execute Cal on the I/Q Calibration function menu to execute the calibration.

This function cannot be executed during Sweep/List execution.

Remote command Execute the calibration for the I/Q quadrature modulator optimal in the current instrument setting status Command

:CALibration[1]|2:IQ:DC

Programming Example

To execute the optimal adjustment for SG1 in the current instrument setting status CAL:IQ:DC

Remote command	Execute the calibration of all frequencies Command :CALibration[1] 2:	for the I/Q quadrature modulator with the range
	Programming Example To execute the calibrati CAL:IQ:FULL	on of SG1 for the range of all frequencies.
Cal Type	or Top>→>I/Q, >I/Q Calibration>Cal Type	
	Selects the calibration	method for the I/Q calibration execution.
	Press F2 Cal Type on the method.	ne I/Q Calibration function menu to select the
	DC	Executes the optimal adjustment with the currently specified frequency. (Default) For other frequency points, the existing correction value is used without change.
	Full	Executes the calibration with the range of all frequencies.
Remote command	Select the calibration n Command	nethod for the I/Q calibration execution
	:CALibration[1] 2:	IQ:TYPE DC FULL
	Query	
	:CALibration[1] 2:	IQ:TYPE?
	Response	
	<type></type>	
	Parameter	
	<type></type>	Calibration method for the I/Q calibration execution
	DC	Executes the optimal adjustment with the currently specified frequency. (Default)
	FULL	Executes the calibration with the range of all frequencies.

	Programming Exa To set the calibrat range of all freque CAL:IQ:TYPE FU CAL:IQ:TYPE? > FULL	ion method for the SG1 I/Q calibration execution to the encies.	
Remote command	Query the calibration method for the calibration execution		
	Query	1 TO. TNEomotion. HYDE?	
	;CALIDIACION[I] 2:IQ:INFomation:TYPE?	
	Response		
	<type></type>	Calibration method for the I/Q calibration execution	
	DC	Executes the optimal adjustment with the currently specified frequency.	
	FULL	Executes the calibration with the range of all frequencies.	
	Programming Example		
	To query the calib CAL:IQ:INF:TYP	ration method for the SG1 calibration execution. E ?	
	> FULL		
Remote command	Query the latest date when the calibration has been executed Query		
:CALibration[1] 2:] 2:IQ:INFomation:DATE?	
	Response		
	<date></date>	yyyy/mm/dd	
	Default	2000/01/01	
	Programming Example		
	To query the date when the calibration for SG1 has been executed.		
	CAL:IQ:INF:DAT	E?	
	> 2011/01/01		

Remote command	Query the latest time when the calibration has been executed Query :CALibration[1] 2:IQ:INFomation:TIME? Response		
	<time></time>	hh:mm:ss	
	Default	00:00:00	
	Programming Example		
	To query the time CAL:IQ:INF:TIM	when the calibration for SG1 has been executed.	
	> 01:01:01		
Restore Default			
	or Top >(→)>I/Q, >I/Q Calibration>Restore Default	
	Returns the calibr	ation value to factory setting status.	
	Press F8 Restore execute the function	Default on the I/Q Calibration function menu to on.	
	This function can	not be executed during Sweep/List execution.	
Remote command		tion value to factory setting status	
	Command		
	:CALibration[1] 2:IQ:DEFault	
	Programming Exa	mple	
	To return the SG1	calibration value to factory setting status.	
	CAL:IQ:DEF		

7.6.2 Analog I/Q Input Adjustments

0.000 V

or Top> \rightarrow >I/Q, > \rightarrow >Analog I/Q Input Adjustments Adjusts/sets the analog I/Q input.

This is available in MG3710A/MG3710E only when option 018/118 is installed.

This is not available in MG3740A.

Press **F1 Analog I/Q Input Adjustments** on page 2 of the I/Q function menu to open the Analog I/Q Input Adjust function menu.

Page	Key No.	Menu Display	Function
1	F1	I Offset	Sets the offset for the I-phase.
	F2	0.000 V Q Offset	Sets the offset for the Q-phase.

Table 7.6.2-1 Analog I/Q Input Adjust Function Menu

I Offset

or Top> \rightarrow >I/Q, > \rightarrow >Analog I/Q Input Adjustments>I Offset Sets the offset for the I-phase.

This is available in MG3710A/MG3710E only when option-018/118 is installed.

This is not available in MG3740A.

Press **F1 I Offset** on the Analog I/Q Input Adjust function menu to set with the **I Offset** dialog box.

Range	$-100\ \mathrm{mV}$ to $100\ \mathrm{mV}$
Resolution	1 mV
Default	0 mV

Remote command

Set the offset for the I-phase

Command

[:SOURce[1]]:DM:IQADjustment:EXTernal:IOFFset <voltage>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:IOFFset?

Response

<voltage>

Unit: V

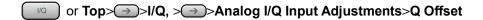
Parameter

<voltage></voltage>	I-phase offset value
Range	-100 mV to $100 mV$
Resolution	1 mV
Default	0 mV
Suffix code	V, MV, UV, When omitted: V

Programming Example

To set the offset for the I-phase to 50 mV. DM:IQAD:EXT:IOFF 50MV DM:IQAD:EXT:IOFF? > 0.050

Q Offset



Sets the offset to the Q-phase.

This is available in MG3710A/MG3710E only when option-018/118 is installed.

This is not available in MG3740A.

Press **F2 Q Offset** on the Analog I/Q Input Adjust function menu to set the offset with the **Q Offset** dialog box.

Range	$-100\ \mathrm{mV}$ to $100\ \mathrm{mV}$
Resolution	1 mV
Default	0 mV

Remote command

Set the offset for the Q-phase

Command

[:SOURce[1]]:DM:IQADjustment:EXTernal:QOFFset <voltage>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:QOFFset?

Response

<voltage>

Unit: V

Parameter

<voltage></voltage>	Q-phase offset value
Range	-100 mV to $100 mV$
Resolution	1 mV
Default	0 mV
Suffix code	V, MV, UV, When omitted: V

Programming Example

To set the offset for the Q-phase to 50 mV. DM:IQAD:EXT:QOFF 50MV DM:IQAD:EXT:QOFF? > 0.050

7.6.3 Analog I/Q Output Adjustments

or Top> \rightarrow >I/Q, > \rightarrow >Analog I/Q Output Adjustments Adjusts/sets the analog I/Q output.

This is available in MG3710A/MG3710E only when option 018/118 is installed.

This is not available in MG3740A.

Press **F2 Analog I/Q Output Adjustments** on page 2 of the I/Q function menu to open the Analog I/Q Output Adjust function menu.

Page	Key No.	Menu Display	Function
1	F1	I Level Trimming 100.0%	Adjusts the I-phase output level gain.
	F2	Q Level Trimming 100.0%	Adjusts the Q-phase output level gain.
	F3	I/Q Common Offset 0.0000 V	Adjusts the I/Q inphase output DC offset level.
	F4	I Diff Offset 0.0000 V	Adjusts the I-phase differential output DC offset level.
	F5	Q Diff Offset 0.0000 V	Adjusts the Q-phase differential output DC offset level.

Table 7.6.3-1 Analog I/Q Output Adjust Function Menu

Set the I/Q signal output

The I/Q signal output voltage and DC offset can be adjusted. The output voltage is set with the ratio (%) to the output voltage defined with the setting of the digital modulation unit.

These voltages are always indicated by open voltage.

Setting ranges of output voltage and DC offset	
Setting range of output voltage	0.0 to 120.0%
Minimum setting resolution	0.1%
Setting range of inphase DC offset Minimum setting resolution	–2.500 to 5.000 V 2 mV
Setting range of differential DC offset Minimum setting resolution	–50.00 to 50.00 mV 0.1 mV

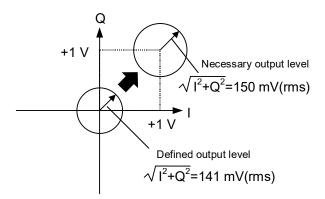
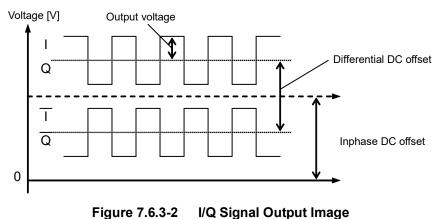


Figure 7.6.3-1 I/Q Signal Output Adjustment Image

Example: To set the I/Q signal output voltage to 150 mV (rms), inphase DC offset to +1 V, and differential DC offset to 0.5 mV.

However, the output voltage defined with the waveform pattern setting is 141 mV (rms).



- 1. Press F1 l level Trimming to display the I level Trimming dialog box.
- 2. Set "106%" (150/141 × 100 = 106 [%]) to the **I level Trimming** dialog box.
- 3. Press **F2 Q level Trimming** to display the **Q level Trimming** dialog box.
- 4. Set "106%" (150/141 × 100 = 106 [%]) to the **Q level Trimming** dialog box.
- 5. Press F3 I/Q Common Offset to display the I/Q Common Offset dialog box.
- 6. Set "1 V" to the **I/Q Common Offset** dialog box.
- 7. Press F4 I Diff Offset to display the I Diff Offset dialog box.
- 8. Set "0.5 mV" to the **I Diff Offset** dialog box.
- 9. Press **F5 Q Diff Offset** to display the **Q Diff Offset** dialog box.
- 10. Set "0.5 mV" to the **Q Diff Offset** dialog box.

I Level Trimming

I/Q	or Top>>>>I/Q, >>>>Analog I/Q Output Adjustments>I Level
Trimm	ing

Adjusts the I-phase output level gain.

This is available in MG3710A/MG3710E only when option-018/118 is installed.

This is not available in MG3740A.

Press **F1 I Level Trimming** on the Analog I/Q Output Adjust function menu to set with the **I Level Trimming** dialog box.

Range	0% to $120%$
Resolution	0.1%
Default	100%

Remote command Adjust the I-phase output level gain Command Command [:SOURce[1]]:DM:IQADjustment:EXTernal:ITRimming <percent>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:ITRimming?

Response

<percent>

Unit: PCT

Parameter

<percent> Range Resolution Default Suffix code I-phase output level gain 0% to 120% 0.1% 100% PCT (%), When omitted: PCT

Programming Example

To adjust the I-phase output level gain to 50%. DM:IQAD:EXT:ITR 50 DM:IQAD:EXT:ITR? > 50.0

Q Level Trimming

or Top>→>I/Q, >→>Analog I/Q Output Adjustments>Q	Level
Trimming	

Adjusts the Q-phase output level gain.

This is available in MG3710A/MG3710E only when option-018/118 is installed.

This is not available in MG3740A.

Press **F2 Q Level Trimming** on the Analog I/Q Output Adjust function menu to set with the **Q Level Trimming** dialog box.

Range	0% to $120%$
Resolution	0.1%
Default	100%

Remote command Adjust the Q-phase output level gain Command Command [:SOURce[1]]:DM:IQADjustment:EXTernal:QTRimming <percent>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:QTRimming?

Response

<percent>

Unit: PCT

Parameter

Q-phase output level gain
0% to 120%
0.1%
100%
PCT (%), When omitted: PCT

Programming Example

To adjust the Q-phase output level gain to 50%. DM:IQAD:EXT:QTR 50 DM:IQAD:EXT:QTR? > 50.0

I/Q Common Offset

or Top>→>I/Q, >→>Analog I/Q Output Adjustments>I/Q Common Offset

Adjusts the I/Q inphase output DC offset level.

This is available in MG3710A/MG3710E only when option-018/118 is installed.

This is not available in MG3740A.

Press **F3 I/Q Common Offset** on the Analog I/Q Output Adjust function menu to set with the **I/Q Common Offset** dialog box.

Range	$-2.5~\mathrm{V}$ to $5~\mathrm{V}$
Resolution	2 mV
Default	0 V

Remote command Adjust the I/Q inphase output DC offset level Command [:SOURce[1]]:DM:IQADjustment:EXTernal:COFFset <voltage>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:COFFset?

Response

<voltage>

Unit: V

Parameter

<voltage></voltage>	I-phase inphase output DC offset level
Range	-2.5 V to 5 V
Resolution	2 mV
Default	0 V
Suffix code	V, MV, UV, When omitted: V

Programming Example

To adjust the I-phase inphase output DC offset level to 50 mV. DM:IQAD:EXT:COFF 50MV DM:IQAD:EXT:COFF? > 0.050

I Diff Offset		
	I/Q or Top>→	⊃>I/Q, >⊖>>Analog I/Q Output Adjustments>I Diff
	Offset	
	Adjusts the I-pha	se differential output DC offset level.
	This is available i installed. This is not availa	in MG3710A/MG3710E only when option-018/118 is ble in MG3740A.
	Press F4 I Diff Of	fset on the Analog I/Q Output Adjust function menu to f Offset dialog box.
	Range	-50 mV to 50 mV
	Resolution	0.1 mV
	Default	0 V
Remote command	Adjust the I-phase differential output DC offset level Command [:SOURce[1]]:DM:IQADjustment:EXTernal:DIOFfset <voltage></voltage>	
	Query [:SOURce[1]]:	DM:IQADjustment:EXTernal:DIOFfset?
	Response	
	<voltage></voltage>	Unit: V
	Parameter	
	<voltage></voltage>	I-phase differential output DC offset level
	Range	-50 mV to $50 mV$
	Resolution	0.1 mV
	Default	
	Suffix code	V, MV, UV, When omitted: V
	Programming Ex	Programming Example
	To adjust the I-ph	ase differential output DC offset level to 5 mV.
	DM:IQAD:EXT:DI	
	DM:IQAD:EXT:DI	IOF?
	> 0.0050	

Q Diff Offset

	 or Top>→>I/Q, >→>Analog I/Q Output Adjustments>Q Diff Offset Adjusts the Q-phase differential output DC offset level. This is available in MG3710A/MG3710E only when option-018/118 is installed. This is not available in MG3740A. 		
		ffset on the Analog I/Q Output Adjust function menu to f Offset dialog box.	
	Range Resolution Default	-50 mV to 50 mV 0.1 mV 0 V	
Remote command	Command [:SOURce[1]]:D Query	se differential output DC offset level	
		DM:IQADjustment:EXTernal:DQOFfset?	
	Response <voltage></voltage>	Unit: V	
		nase differential output DC offset level to 5 mV.	
	DM:IQAD:EXT:DÇ DM:IQAD:EXT:DÇ		

> 0.0050

7.6.4 Internal Baseband Adjustments

or Top> \rightarrow >I/Q, > \rightarrow >Internal Baseband Adjustments Adjusts the I/Q signal generated in the internal Baseband.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F3 Internal Baseband Adjustments** on page 2 of I/Q function menu to open the **Internal Baseband Adjustments** dialog box and Internal Baseband Adjust function menu.

Table 7.6.4-1	Internal Baseband Adjust Function Menu
---------------	--

Page	Key No.	Menu Display	Function
1	F1	I Offset	Sets the DC offset for the I-phase.
		0.000 %	
	F2	Q Offset	Sets the DC offset for the Q-phase.
		0.000 %	
	F3	Gain Balance	Adjusts the I/Q phase gain balance.
		0.000 dB	
	F4	Quad. Angle	Adjusts the quadrature angle of I/Q phase.
		0.00 deg	
	F5	I/Q Phase	Adjusts the Baseband signal phases.
		0.00 deg	
	F6	I/Q Skew	Adjusts the I/Q phase time difference (timing).
		0.00000000000 s	
	$\mathbf{F7}$	I/Q Delay	Adjusts the Baseband signal output timing.
		$0.000000000000 \ s$	

I Offset

or Top> \rightarrow >I/Q, > \rightarrow >Internal Baseband Adjustments>I Offset Sets the DC offset for the I-phase.

Press **F1 I Offset** on the Internal Baseband Adjust function menu to set with the **I Offset** dialog box.

Range	-20% to $20%$
Resolution	0.025%
Default	0%

Remote command	Set the DC offset for Command [:SOURce[1] 2]:	or the l-phase DM:IQADjustment:IOFFset <percent></percent>
	Query [:SOURce[1] 2]:DM:IQADjustment:IOFFset?	
	Response <percent></percent>	PCT
	Parameter	
	<percent></percent>	DC offset value
	Range	-20% to $20%$
	Resolution	0.025%
	Default	0%
	Suffix code	PCT (%), When omitted: PCT
	Programming Exar	mple
	To adjust the I-phase DC offset to 10%.	
	DM:IQAD:IOFF 10)
	DM:IQAD:IOFF?	
	> 10.000	

Q	Offs	et
---	------	----

Offset	Sets the DC offset	>I/Q, > \rightarrow >Internal Baseband Adjustments>Q Offset tor the Q-phase.		
		on the Internal Baseband Adjust function menu to set		
	Range	-20% to $20%$		
	Resolution	0.025%		
	Default	0%		
Remote command	Set the DC offset	for the Q-phase		
	Command			
	[:SOURce[1] 2]	[:SOURce[1] 2]:DM:IQADjustment:QOFFset <percent></percent>		
	Query			
	[:SOURce[1] 2]:DM:IQADjustment:QOFFset?			
	Response			
	<percent></percent>	Unit: PCT		
	Parameter			
	<percent></percent>	Q-phase DC offset value		
	Range	-20% to $20%$		
	Resolution	0.025%		
	Default	0%		
	Suffix code	PCT, When omitted: PCT		
	Programming Example			
	To adjust the Q-phase DC offset to 10%.			
	DM:IQAD:QOFF 10			
	DM:IQAD:QOFF?			
	> 10.000			

Gain Balance

or Top>→>I/Q, >→>Internal Baseband Adjustments>Gain

Balance

Adjusts the I/Q phase gain balance.

Press **F3 Gain Balance** on the Internal Baseband Adjust function menu to set with the **Gain Balance** dialog box.

Range	-1 dB to 1 dB
Resolution	0.001 dB
Default	0 dB

When the positive value is set, Gain of the I-phase becomes larger than the Q-phase.

The amplitude ratio of the I/Q phase is the gain balance [dB]. Even if the gain balance is changed, RMS value is not changed.

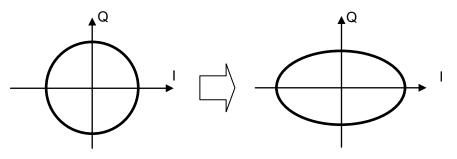


Figure 7.6.4-1 Gain Balance

Remote command

Adjust the I/Q phase gain balance Command

[:SOURce[1]|2]:DM:IQADjustment:GAIN <rel ampl>

Query

[:SOURce[1]|2]:DM:IQADjustment:GAIN?

Response

<rel_ampl>

Unit: dB

Parameter

<rel_ampl> Gain balance of the I/Q phase Range -1 dB to 1 dB Resolution 0.001 dB Default 0 dB Suffix code DB, When omitted: DB

Programming Example

To set the gain balance of I/Q phase to 1 dB. DM:IQAD:GAIN 1 DM:IQAD:GAIN? > 1.000

Quad. Angle



Angle

Adjusts the quadrature angle of I/Q phase.

Press **F4 Quad. Angle** on the Internal Baseband Adjust function menu to set with the **Quad. Angle** dialog box.

Range	$-10 \deg$ to $10 \deg$
Resolution	0.01 deg
Default	0 deg

The positive value increases the I/Q quadrature angle from 90 degrees, and the negative value decreases the I/Q quadrature angle from 90 degrees. For zero, the I/Q quadrature angle is 90 degrees.

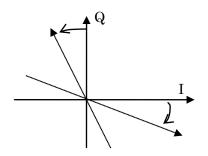


Figure 7.6.4-2 Quadrature Angle

Remote command	Adjust the I/Q phase quadrature angle Command	
	[:SOURce[1] 2]:DM:IQADjustment:QSKew <angle></angle>	
	Query	
	[:SOURce[1] 2]:DM:IQADjustment:QSKew?	

Response

<angle>

Unit: deg

Parameter	
<angle></angle>	Quadrature angle of the I/Q phase
Range	-10 deg to 10 deg
Resolution	0.01 deg
Default	0 deg
Suffix code	DEG, When omitted: DEG

Programming Example

To adjust the quadrature angle of I/Q phase to 90 deg + 5 deg. DM:IQAD:QSK 5 DM:IQAD:QSK? > 5.00

I/Q F

Phase	Phase Adjusts the Baseband s This is used to adjust m forming. The setting is Multi SG Function Mer	nultiple SGs signal phases with MIMO or beam same as F7 I/Q Phase in Table 7.3.15 ⁻ 1 "Sync nu".
	with the I/Q Phase dial	he Internal Baseband Adjust function menu to set og box.
	Range Resolution Default	-360 deg to 360 deg 0.01 deg 0 deg e is set, the phase is adjusted to be promoted.
Remote command	Adjust the Baseband s Command [:SOURce[1] 2]:DM:	ignal phase IQADjustment:PHASe <phase></phase>
	Query [:SOURce[1] 2]:DM:	IQADjustment:PHASe?
	Response	
	<phase></phase>	Unit: deg
	Parameter	
	<phase></phase>	Baseband signal phase
	Range	-360 deg to 360 deg
	Resolution	0.01 deg
	Default	0 deg
	Suffix code	DEG, When omitted: DEG

Programming Example

To set the Baseband signal IQ phase to 5 deg. DM:IQAD:PHAS 5 DM:IQAD:PHAS? > 5.00

I/Q time difference: I/Q Skew

Remote

fference: I/Q	Skew	
	or Top> →	⊇>l/Q, >⊖>>Internal Baseband Adjustments>l/Q
	Skew	
	Adjusts the I/Q pl	hase time difference (timing).
	Press F6 I/Q Skev with the I/Q Skev	v on the Internal Baseband Adjust function menu to set v dialog box.
	Range	-800 ns to 800 ns
	Resolution	1 ps
	Default	0 s
	When the positive	e value is set, the I-phase is delayed against the
	Q-phase.	
e command	Adjust the time d	ifference (timing) between I-phase and Q-phase
	Command	
	[:SOURce[1] 2]]:DM:IQADjustment:SKEW <time></time>
	Query	
	[:SOURce[1] 2]]:DM:IQADjustment:SKEW?
	Response	
	<time></time>	Unit: S
	Parameter	
	<time></time>	Time difference between the I-phase and
		Q-phase
	Range	-800 ns to 800 ns
	Resolution	1 ps
	Default	0 s
	Suffix code	S, MS, US, NS, PS, When omitted: S
	Programming Ex	ample
	To set the time di	fference between I-phase and Q-phase to 500 ps.
	DM:IQAD:SKEW 5	500PS
	DM:IQAD:SKEW?	
	> 0.000000005	500

I/Q Delay

Delay		
]>I/Q, >⊖>>Internal Baseband Adjustments>I/Q
	Delay	
	Adjusts the Basel	oand signal output timing.
	signals to reach to	a multiple SGs are to be synchronized and timings for b DUT are to be adjusted. The setting is same as F8 I/Q 3.15-1 "Sync Multi SG Function Menu".
	Press F7 I/Q Dela with the I/Q Dela	y on the Internal Baseband Adjust function menu to set y dialog box.
	Range	-400 ns to 400 ns
	Resolution	1 ps
	Default	0 s
Remote command	Command	and signal output timing :DM:IQADjustment:DELay <time></time>
	Query	
	[:SOURce[1] 2]	:DM:IQADjustment:DELay?
	Response	
	<time></time>	Unit: S
	Parameter	
	<time></time>	Baseband signal output timing
	Range	-400 ns to 400 ns
	Resolution	1 ps
	Default	0 s
	Suffix code	S, MS, US, NS, PS, When omitted: S
	Programming Ex	ample
	To set the time di	fference between I-phase and Q-phase to 300 ns.
	DM:IQAD:DEL 30	OONS
	DM:IQAD:DEL?	
	> 0 000003000	100

> 0.00000300000

This chapter describes the operations and screen display of the BER measurement function.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

8.1	Functi	on, Performance, and Communication	8-2
	8.1.1	Function and performance	8-2
	8.1.2	External connection	8-5
8.2	Displa	y Description	8-6
	8.2.1	BER dialog box	8-6
8.3	Perfor	ming BER Measurement	8-12
	8.3.1	Starting/stopping BER measurement	8-14
	8.3.2	Measure Mode	8-19
	8.3.3	Measurement end conditions: Count Mode	8-21
	8.3.4	Data Type	8-24
	8.3.5	Resync Condition	8-26
	8.3.6	BER Interface	8-32
8.4	PN Fix	Pattern	8-35
	8.4.1	Setting PN_Fix Pattern: PN Fix Pattern	8-36
	8.4.2	Synchronization establishing conditions of	
		PN_Fix patterns	8-39
	8.4.3	Examples of using PN_Fix patterns	8-41
8.5	User D	Defined Pattern	8-43
	8.5.1	Displaying user defined patterns	8-45
	8.5.2	Setting user defined patterns: User Pattern	ı 8-48
	8.5.3	Loading user defined patterns: Open	8-51
8.6	BER L	.og	8-54
	8.6.1	Deleting BER logs: Clear	8-57
	8.6.2	Saving BER logs: Save	8-58
8.7	About	BER Measurement Operations	8-61

8.1 Function, Performance, and Communication

(AUX Fctn or Top>→>Auxiliary, >BER

When the MG3710A/MG3710E/MG3740A has the option 021/121 BER measurement function installed, it can measure Bit Error Rates (BER) of externally input signals.

To switch the MG3710A/MG3710E/MG3740A to the BER measurement mode, press **Aux Fnct** on the main function menu or press **F5 Auxiliary** on page 2 of the top function menu to display the Auxiliary function menu, and press **F2 BER**.

This chapter assumes that the MG3710A/MG3710E/MG3740A is in the BER measurement mode, unless otherwise specified.

8.1.1 Function and performance

The BER measurement function of the MG3710A/MG3710E/MG3740A has the following functions and performance:

Input signal Data, Clock, and Enable (Polarity inversion is enabled.) Input level TTL Input bit rate 100 bps to 40 Mbps Measurable patterns PN9, PN11, PN15, PN20, PN23, ALL0, ALL1, Alternate (repetition of 01), PN9Fix, PN11Fix, PN15Fix, PN20Fix, PN23Fix, and user defined patterns Number of measurable bits ≤ 4294967295 bits = $(2^{32} - 1 \text{ bit})$ Number of measurable error bits ≤ 4294967295 bits = $(2^{32} - 1 \text{ bit})$ Measurement end condition Selectable between the number of measurement bits and the number of measurement error bits Operation mode Measure Mode : Continuous, Single, Endless Count Mode : Data, Error : On, Off Auto Resync

Synchronization establishing condition	
Depends on measured patterns.	
PN 9, 11, 15, 20, 23	: (PN order × 2) bit continuous error free
PN_Fix pattern	: Establish the synchronization with PN signal
	by PN order \times 2 bits error free, and then
	establish the synchronization with PNfix signal
	from the start bit of PNfix signal by PN order
	error free.
ALL0, ALL1, repetition	of 01 : 10 bit continuous error free
User defined patterns	: 8 to 1024 bit (variable) error free
	The start bit to be used for detecting
	synchronization can also be selected.
Probabilities of synchror	nization

Probabilities of synchronization

For PN signals on the MG3710A/MG3710E/MG3740A, the synchronization establishing condition is (PN order \times 2) bit continuous error free. For PN signals including random errors, probabilities of a section in which (PN order \times 2) bit continuous error free occurs are shown in the table below. The probabilities can be deemed as those of synchronizing with PN signals with a certain error rate in 1 cycle.

PN order PN signal error rate (%)	PN9	PN15	PN23
10	15.0	4.2	0.79
3	57.8	40.1	24.6
1	83.5	74.0	63.0
0.1	98.2	97.0	95.5

Table 8.1.1-1 Probabilities of Synchronizing with PN Signals (%)

Detection of SyncLoss

x/y:

When the Auto Resync setting is ON, the SyncLoss detection conditions are as follows:

y = number of measurement bit: selectable among 500,
5000 and 50000 bits
x = number of error bits among y bits: selectable in the

range from 1 to y/2

(When Auto Resync is Off, SyncLoss is not detected)

Resynchronization judgment

Based on detection of SyncLoss.

Resynchronization operations

Selectable between Clear BER Count and Count Keep

Display

Status, Error Rate, Error Count, SyncLoss Count, number of measurement bits

Measurement result clearing function

This function can start the measurement from 0 by clearing the measurement values while keeping synchronization during the BER measurement.

8.1.2 External connection

BER measurement requires signals to be input externally. The signals are input via the AUX connector on the rear panel. Refer to Table 3.1.2-1 "AUX Connectors".

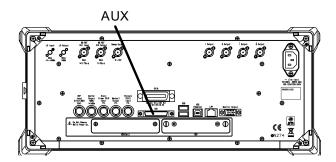


Figure 8.1.2-1 BER Measurement Input Connector

BER measurement uses three terminals of the AUX connectors:

• BER CLK terminal:	Inputs clock signals for BER measurement (TTL
	level and DC coupling).
• BER Enable terminal:	Inputs Enable signals for BER measurement of
	burst signals (TTL level and DC coupling).

• BER Data terminal: Inputs data signals for BER measurement (TTL level and DC coupling).

When Enables signals are not used, do not connect to the Enable terminal and set Enable Active to "Disable". Refer to 8.3.6 "BER Interface".

8.2 Display Description

This section describes display items of the BER measurement function.

8.2.1 BER dialog box

AUX Fctn or Top>→>Auxiliary, >BER

Press **Aux Fnct** on the main function menu or **F5 Auxiliary** on page 2 of the top function menu to display the Auxiliary function menu. Press **F2 BER** to display the **BER** dialog box.

The **BER** dialog box shows a measurement result.

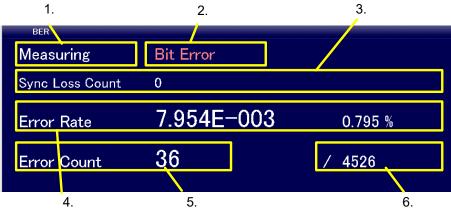


Figure 8.2.1-1 BER Dialog Box

When BER is not measured, Error Rate 0, Error Count 0, and Data Count 0 are displayed in the **BER** dialog box.

Table 0.2.1-1 DISDIAV ILEITIS OF DER DIATOU DU	Table 8.2.1-1	Display Items of BER Dialog Box
--	---------------	---------------------------------

No.	Display	Description
1	Status	Indicates the status of measurement.
2	Error	Explains an error when it occurs.
3	Sync Loss Count	Indicates a SyncLoss count and a reason why it stopped.
4	Error Rate	Indicates an error rate in index and percentage.
5	Error Count	Indicates the number of error bits.
6	Data Count	Indicates the number of measurement bits.

Status

Indicates the status of the BER measurement.

Table 8.2.1-2 Measurement Status

Display	Description
Stop	Measurement stopped.
Synchronizing	Synchronization is being established.
Measuring	Measurement is in progress.
OverflowDataCount	Measurement stopped because the number of measurement bits exceeded the maximum value (2 ³² - 1 bit).
OverflowSyncLoss	Measurement stopped because the SyncLoss count exceeded the maximum value (65535).

Remote command

Query the status of the BER measurement

Query

[:SENSe]:BERT[:BASeband]:MEASure?

Response

<status>

Parameter

<status></status>	Measurement status
0	Stop
1	Measuring
2	Synchronizing
3	Stopped because a measurement error occurs.
4	Stopped because the SyncLoss count exceeded
	the maximum value.
	OverflowSyncLoss
5	Stopped because the number of count bits
	exceeded the maximum value.
	OverflowDataCount

Details

When a measurement error occurs,

[:SENSe]:BERT[:BASeband]:ERRor? can be used to query the details of the error.

Programming Example

To query the current operation status. BERT:MEAS? > 0

Error

Indicates the error information of the BER measurement.

Table 8.2.1-3 Explanation of Errors

Display	Description
Bit Error	An error bit occurred.
SyncLoss	SyncLoss occurred.
ClockError	The input clock signal was abnormal.
EnableError	The input enable signal was abnormal.

Remote command

Query the error information of the BER measurement

Query

[:SENSe]:BERT[:BASeband]:ERRor?

Response

<status>

Parameter

<status></status>	Measurement status		
Value	= bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6		
	+ bit7 + bit8 + bit9 + bit10	+ bit11 + bit12	
	+ bit13 + bit14 + bit15		
When a target applicat	ion is BER, bits are assigned	l as follows:	
	bit $0: 2^0 = 1$	Sync Loss occurred	
	$\texttt{bit1} : 2^1 = 2$	Clock Error occurred	
	$bit2: 2^2 = 4$	Enable Error	
		occurred	
	bit $3 : 2^3 = 8$	(Not Used)	
	bit $4 : 2^4 = 16$	(Not Used)	
	bit $5: 2^5 = 32$	(Not Used)	
	bit6: $2^6 = 64$	(Not Used)	
	bit $7: 2^7 = 128$	(Not Used)	
	bit8: $2^8 = 256$	(Not Used)	
	bit9: $2^9 = 512$	(Not Used)	
	$bit10: 2^{10} = 1024$	(Not Used)	
	$bit11:2^{11} = 2048$	(Not Used)	
	$bit12:2^{12}=4096$	(Not Used)	
	$bit13:2^{13} = 8192$	(Not Used)	
	$bit14:2^{14} = 16384$	(Not Used)	
	$bit15:2^{15}=32768$	(Not Used)	
Range	0 to 65535		

	Details 0 is returned i	f both SG and BER operate normally.
	<pre>Programming To query the c BERT:ERR? > 0</pre>	Example urrent operation status.
SyncLoss Count		
	Displays a Syr	nc Loss count of the BER measurement.
Remote command	Query	Loss count of the BER measurement
	Response	
	<count></count>	
	Parameter	
	<count></count>	Sync Loss count
	Range	0 to 65535
	Programming	Example
	To query a Syr	nc Loss count.
	BERT:SYNL:C	OUN?
	> 500	
Error Rate		
	Displays a bit	error rate of the BER measurement function.
	Error Rate is 1	represented in two ways: in index; and in percentage. Each n follows the rules:
	In index	
		unded to the digit of a ten-thousandth of the maximum esented before the digit of a ten-thousandth.
	Example:	0.00978495 is displayed as 9.785E-03.
		presented in percentage, rounded to four decimal places, ed before four decimal places.
	Example:	0.00978495 is displayed as 0.978%.

Remote command	Query the bit e	rror rate of the BER measurement function	
	Query		
	:FETCh:BERT:	ERRor:RATE? EP ER	
	Response		
	<rate></rate>		
	Parameter		
	EP	Returns the bit error rate in percentage.	
	ER	Returns the bit error rate as an index.	
	<rate></rate>	Value of the bit error rate	
	EP	0.000 to 100.000 %	
	ER	0.000E+00 to 1.000E + 02	
	Programming Example		
	To query the bit	error rate of the BER measurement function in	
	percentage.		
	FETC:BERT:ER	R:RATE? EP	
	> 5.000		
Error Count			
	Displays the nu	mber of error bits of the BER measurement.	
Remote command	Query the number of error bits of the BER measurement Query :FETCh:BERT:ERROR:COUNT?		
	•••••••••••••••••••••••••••••••••••••••		
	Response		
	<bit></bit>		
	Parameter		
	<bit></bit>	Number of error bits	
	Range	0 to 2 ³² –1 bit	
	Programming E	Example	
	To query the nu	mber of error bits.	
	FETC:BERT:ER	R:COUN?	
	> 500		

Number of measurement bits: Data Count

Displays the number of measurement bits of the BER measurement.

 Remote command
 Query the number of measurement bits of the BER measurement

 Query
 :FETCh:BERT:DATA:COUNt?

Response

<bit>

Parameter

<bit> Range Number of measurement bits 0 to 2^{32} -1 bit

Programming Example

To query the number of measurement bits. FETC:BERT:DATA:COUN? > 10000

8.3 Performing BER Measurement

 $(AUX For Top > \rightarrow > Auxiliary, > BER$

Use the BER function menu to set and perform the BER measurement.

- 1. Following the explanation in 8.1.2 "External connection", input signals externally.
- 2. Use **F4 Measure Mode** to select a mode for the BER measurement.
- 3. Use **F5 Count Mode** to set the measurement end conditions.
- 4. Use **F6 Data Type** to select data pattern for measurement.
- 5. Use **F1 Resync Condition** on page 2 of the function menu to set the automatic resynchronization function.
- 6. Use **F2 BER Interface** on page 2 of the function menu to set the interface for the BER measurement.
- 7. Use **F1 Start BER** and **F2 Stop BER** to start and stop the measurement, respectively.

BER function menu

AUX or Top> \rightarrow >Auxiliary, >BER

Press **Aux Fnct** on the main function menu or **F5 Auxiliary** on page 2 of the top function menu to display the Auxiliary function menu. Press **F2 BER** to display the BER function menu.

Page	Key No.	Menu Display	Function
1	F1	Start BER Test	Starts the BER measurement.
			Refer to 8.3.1 "Starting/stopping BER measurement".
	F2	Stop BER Test	Stops the BER measurement.
			Refer to 8.3.1 "Starting/stopping BER measurement".
	F3	Clear BER	Clears Data Count, ErrorCount, or SyncLossCount.
		Count	Refer to 8.3.1 "Starting/stopping BER measurement".
	F4	Measure Mode	Selects a mode for the BER measurement from Single,
		Continuous	Continuous, or Endless.
			Refer to 8.3.2 "Measure Mode".
	F5	Count Mode	Selects either the number of measurement bits or the
			number of error bits for the measurement end condition.
			Refer to 8.3.3 "Measurement end conditions: Count Mode".
	Da		
	F6	Data Type	Selects data pattern for measurement.
		PN9	Refer to 8.3.4 "Data Type".
	$\mathbf{F7}$	PN Fix Pattern	Sets the PN Fix pattern.
			Refer to 8.4 "PN Fix Pattern".
	F8	User Pattern	Queries or sets user defined patterns.
			Refer to 8.5 "User Defined Pattern".

Table 8.3-1 BER Function Menu

8.3 Performing BER Measurement

Page	Key No.	Menu Display	Function
2	F1	Resync	Sets the automatic resynchronization function.
		Condition	Refer to 8.3.5 "Resync Condition".
	F2	BER Interface	Sets the interface for the BER measurement.
			Refer to 8.3.6 "BER Interface".
	F3	Show Log	Displays, saves, or deletes a log of the BER
			measurement result.
			Refer to 8.6 "BER Log".
	F4	Auto Restart	Sets whether to auto-restart BER measurement when
		<u>Off</u> On	output level is changed.
			Refer to 8.3.1 "Starting/stopping BER measurement".
	$\mathbf{F7}$	Level	Sets the output level.
		-144.00 dBm	Refer to 5.2 "Output Level Setting Method: Level".

Table 8.3-1 BER Function Menu (Cont'd)

8.3.1 Starting/stopping BER measurement

Start BER Test

Remote command Start the BER measurement Command :INITiate:BERT[:IMMediate] Programming Example To start the BER measurement. INIT:BERT Stop BER Test Stops the BER measurement. Example or Top>>Auxiliary, >BER>Stop BER Test Stops the BER measurement. Pressing F2 Stop BER Test during BER measurement stops measurement and saves measurements while stopped to the log.
<pre>:INITiate:BERT[:IMMediate] Programming Example To start the BER measurement. INIT:BERT Stop BER Test UNIT:BERT Or Top>→Auxiliary, >BER>Stop BER Test Stops the BER measurement. Pressing F2 Stop BER Test during BER measurement stops</pre>
Programming Example To start the BER measurement. INIT:BERT Stop BER Test Image: Stop BER Test
To start the BER measurement. INIT:BERT Stop BER Test Image: Stop BER Test
INIT:BERT Stop BER Test INIT:BERT INIT:BERT Stop BER Test Stops the BER measurement. Pressing F2 Stop BER Test during BER measurement stops
Stop BER Test
AUX or Top>→>Auxiliary , > BER>Stop BER Test Stops the BER measurement. Pressing F2 Stop BER Test during BER measurement stops
Stops the BER measurement. Pressing F2 Stop BER Test during BER measurement stops
Pressing F2 Stop BER Test during BER measurement stops
measurement and saves measurements while stopped to the log.
Remote command Stop the BER measurement
Command
:ABORt:BERT
Programming Example
To stop the BER measurement.
ABOR: BERT
Operation description Other measurement end conditions
Other measurement end conditions depend on operation modes.

Table 8.3.1-1	Measurement End Conditions of BER Measurement
	(Single Measurement Mode)

Auto Resync Count Mode	On	Off
Data	 Reaches the specified number of the measurement bits. Reaches the maximum SyncLoss count (65535). 	• Reaches the specified number of the measurement bits.
Error	 Reaches the specified number of the measurement error bits. Reaches the maximum number of measurement bits (2³²-1 bit). Reaches the maximum SyncLoss count (65535). 	 Reaches the specified number of the measurement error bits. Reaches the maximum number of measurement bits (2³²-1 bit).

Setting parameters stops measurements (except for BER Interface).

In the Continuous measurement mode, if the condition in Table 8.3.1-1 is met, the measurement stops. Then, it starts again.

The BER measurement continues even if you navigate to other screens during the BER measurement.

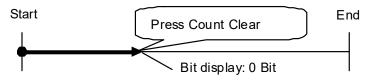
When you turn the power off and restart the

MG3710A/MG3710E/MG3740A during measurement, the BER measurement becomes the stop status.

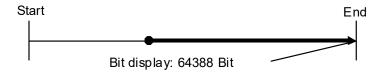
When 40 Mbps signals are measured, the result reaches the upper limit of bit count at the longest 107.4 seconds or so, and the measurement stops.

Clear BER Count	
	Aux or Top > \rightarrow > Auxiliary , > BER > Clear BER Count Clears the result of the BER measurement.
	Press F3 Clear BER Count to clear the result of the BER measurement.
	This is not available when Measurement Mode is Continuous.
Remote command	Clear the result of the BER measurement
	[:SENSe]:BERT[:BASeband]:COUNt:CLEar
	Programming Example
	To clear Error Rate, ErrorCount and SyncLossCount.
	BERT:COUN:CLE
Operation description	When Clear BER Count is pressed during synchronizing/measuring
	The number of measurement bits, the number of error bits, and the
	SyncLoss count are cleared during measurement while keeping
	synchronization. However, the displayed measurement status is not
	cleared. Therefore, if you perform Clear BER Count during measurement,
	and the measurement finishes, then the number of measurement bits is less than the specified number of measurement bits. Operations of the
	number of error bits and the SyncLoss count are similar to this.
	When you press F3 Clear BER Count , the measurement values (Data Count, Error Count, and Sync Loss Count) are stored as offset values.
	Then, the displayed values are updated by subtracting the offset values
	from the measurement values. These offset values are reset to 0 when
	the measurement finishes or stops.
	Executing Clear BER Count during measurement saves CLEAR to the
	log.
	Example: The displayed result of measuring 100000 bits when you press
	Clear BER Count.
	1. Start the measurement.
	Start End
	↓
	Bit display: 35612 Bit

2. Press **F3 Clear BER Count**. When the key is pressed, the number of count bits is 35612, but the "0 bit" is displayed.



3. When the measurement finishes, the total count bit is 100000 bits, but the "64388 bit" (100000 – 35612) is displayed.



When Clear BER Count is pressed after the measurement is finished or stopped

The number of measurement bits, the number of error bits, the SyncLoss count, the error rate, and the status displayed on the screen are cleared. Executing Clear BER Count saves CLEAR to the log.

Auto Restart

Auxiliary, >BER>→>Auto Restart

Enables/disables the Auto Restart.
Press is to display the page 2 of BER function menu. Press F4 Auto
Restart to select the Auto Restart setting after changing output level.
On Auto Restart enabled.
Off Auto Restart disabled. (Default).

Remote command

Enable/disable the Auto Restart.

Command

[:SENSe]:BERT:[BASeband]:RSTart:AUTO <boolean>

Query

[:SENSe]:BERT:[BASeband]:RSTart:AUTO?

Response

<boolean> 0 or 1

Parameter

<boolean></boolean>	Auto Restart setting
ON 1	Auto Restart enabled.
OFF 0	Auto Restart disabled (Default).

Programming Example

To enable Auto Restart.

BERT:RST:AUTO ON
BERT:RST:AUTO?
> 1

8.3.2 Measure Mode

	AUX or Top>→>A	uxiliary, >BER>Measure Mode	
	Selects a mode for the BER measurement.		
	Press F4 Measure Mod	le to display the Measure Mode function menu to	
	select a measurement	mode.	
	Single	Measures selected data patterns until a result reaches the specified number of bits or the specified number of error bits.	
	Continuous	Repeats Single measurements (Default).	
	Endless	Measures data until a result reaches the upper	
		limit of the measurement count bit (4294967295	
		bits).	
_ / .			
Remote command	Select a mode for the	BER measurement	
	Command [:SENSe]:BERT[:BASeband]:MODE SINGle CONTinuous ENDLess		
	[.06006].0601[.060	Sebanaj.Mobe Single (Continuous Endless	
	Query		
	[:SENSe]:BERT[:BASeband]:MODE?		
	Response		
	<mode></mode>	SING, CONT, or ENDL	
	Parameter		
	<mode></mode>		
	SINGle	Measures selected data patterns until a result reaches the specified number of bits or the specified number of error bits.	
	CONTinuous	Repeats Single measurements (Default).	
	ENDLess	Measures data until a result reaches the upper	
		limit of the measurement count bit (4294967295	
		bits).	
	Programming Example	e	
	• • •	t mode to Continuous.	
	BERT:MODE CONT		

BERT:MODE?
> CONT

Operation description Display the BER measurement mode

Displayed measurement results by BER measurement modes are shown below. Refer to Figure 8.2.1-1 "BER Dialog Box" for displayed status and error rates during measurement.

When Measure Mode is Continuous:

Status, Error, and Sync Loss Count are updated as required during measurement. When measurement starts again, the measurement results are cleared to 0.

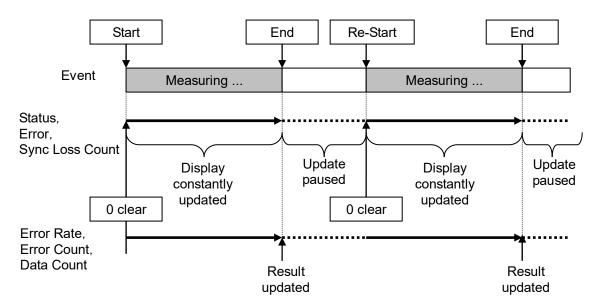
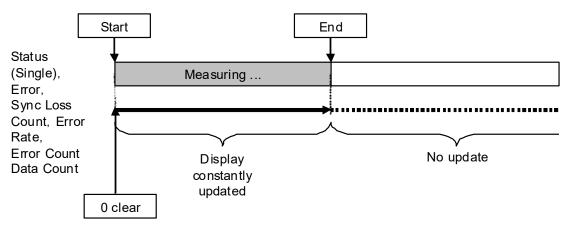
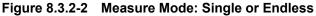


Figure 8.3.2-1 Measure Mode: Continuous

When Measure Mode is Single or Endless:

Error, Error Rate, Error Count, Data Count, and Status (only for Single) are updated as required during measurement. When the measurement finishes, updating stops.





8.3.3 Measurement end conditions: Count Mode

AUX or Top>>>Auxiliary, >BER>Count Mode

Sets the measurement end conditions.

This function is not available when Measure Mode is set to Endless.

Press **F5 Count Mode** to display the BER Count mode function menu to set the measurement end conditions.

Page	Key No.	Menu Display	Function
1	F1	Count Mode	Selects a measurement end condition.
		<u>Data</u> Error	
	F2	Data	Sets the number of measurement bits.
		1000	
	F3	Error	Sets the number of measurement error bits.
		1	

Table 8.3.3-1 Count Mode Function Menu

Selecting measurement end conditions: Count Mode

(AUX) or Top>>>>Auxiliary, >BER>Count Mode>Count Mode Selects a measurement end condition. This function is not available if Measure Mode is set to Endless. Press F1 Count Mode on the BER Count mode function menu to select a measurement end condition. Data Specifies the number of measurement bits(Default). Error Specifies the number of measurement error bits. **Remote command** Select a measurement end condition Command [:SENSe]:BERT[:BASeband]:STOP:CRITeria[:SELect] EBIT|NONE Query [:SENSe]:BERT[:BASeband]:STOP:CRITeria[:SELect]? Response <mode> Parameter <mode> NONE Specifies the condition to the number of measurement bits (Default). EBIT Specifies the condition to the number of

measurement error bits.

Programming Example

To set the Count mode to the number of measurement bits. BERT:STOP:CRIT NONE BERT:STOP:CRIT? > NONE

Setting the number of measurement bits: Data

AUX or Top>>>>Auxiliary, >BER>Count Mode>Data

Sets the number of measurement bits when Count Mode is Data. This function is not available if Measure Mode is set to Endless. Press **F2 Data** on the Count mode function menu to specify the number of measurement bits in the **Data** dialog box. When accumulated measurement bits reach the specified number of bits, the measurement stops.

Table 8.3.3-2	2 Setting	Range
---------------	-----------	-------

Setting range	1000 bit to $2^{32}-1$ (4294967295) bit
Resolution	1 bit
Default	1000 bit

Remote command

Set the number of measurement bits when Count Mode is Data Command

[:SENSe]:BERT[:BASeband]:TBITs <ext integer>

Query

[:SENSe]:BERT[:BASeband]:TBITs?

Response

<ext integer>

Parameter

<ext_integer> Based on Table 8.3.3-2 "Setting Range".

Programming Example

To set the number of measurement bits to 2000 bits. BERT:TBIT 2000 BERT:TBIT? > 2000

Setting the number of measurement error bits: Error

or Top> > Auxiliary, >BER>Count Mode>Error Sets the number of measurement error bits when Count Mode is Error. This function is not available if Measure Mode is set to Endless. Press F3 Error on the Count mode function menu to specify the number of measurement error bits in the Error dialog box. When accumulated measurement error bits reach the specified number of bits, the measurement stops.

Table 8.3.3-3 Setting Range

Setting range	1 bit to 2^{32} –1 (4294967295) bit
Resolution	1 bit
Default	1 bit

Remote command

Set the number of measurement error bits when Count Mode is Error Command

[:SENSe]:BERT[:BASeband]:STOP:CRITeria:EBIT <ext integer>

Query

[:SENSe]:BERT[:BASeband]:STOP:CRITeria:EBIT?

Response

<ext_integer>

Parameter

<ext_integer> Based on Table 8.3.3–3 "Setting Range".

Programming Example

To set the number of measurement error bits to 2000 bits. BERT:STOP:CRIT:EBIT 2000 BERT:STOP:CRIT:EBIT? > 2000

8.3.4 Data Type			
	Aux or Top>→>Auxiliary, >BER>Data Type Select a data type.		
		ta Type to display the Data type function menu to select a	
	data pattern for the measurement. Use \bigcirc to display page 2.		
	Options	PN9, PN11, PN15, PN20, PN23,	
	Ĩ	PN9Fix, PN11Fix, PN15Fix, PN20Fix, PN23Fix,	
		ALL0 (all 0s), ALL1 (all 1s), Alternate (0, 1, 0, 1),	
		User Defined (user defined patterns)	
	Note:		
		N_Fix pattern is a pattern consisting of repeated parts of PN	
		rns and PN patterns with length shorter than 1 cycle.	
	-	to 8.4 "PN Fix Pattern" and 8.5 "User Defined Pattern" for	
	detail	s of PN_Fix and UserDefined.	
Remote command	Select a dat	a type	
	Command		
	[:SENSe]:BERT[:BASeband]:PRBS[:DATA]		
		PN15 PN20 PN23 ALL0 ALL1 ALT FPN9 FPN11 FPN15 F	
	PN20 FPN23 USER		
	_		
	Query		
	[:SENSe]:BERT[:BASeband]:PRBS[:DATA]?		
	Response		
	<pattern></pattern>		
	Parameter		
	<pattern></pattern>	Type of data patterns	
	PN9	PN9 (Default)	
	PN11	PN11	
	PN15	PN15	
	PN20	PN20	
	PN23	PN23	
	FPN9	PN9Fix	
	FPN11	PN11Fix	
	FPN15	PN15Fix	
	FPN20	PN20Fix	
	FPN23	PN23Fix	
	ALLO	All $0s(000)$	
	ALL1	All 1s (111) Repetitions of 0, 1 $(0, 1, 0, 1,)$	
	ALT USER	Repetitions of 0, 1 (0, 1, 0, 1,) User defined patterns	

Programming Example

To set the data pattern for measurement to PN23. BERT:PRBS PN23 BERT:PRBS? > PN23

8.3.5 Resync Condition

$\binom{AUX}{Fch}$ or Top> \rightarrow >Auxiliary, >BER> \rightarrow >Resync Condition

Sets the automatic resynchronization function.

Press \bigcirc to display page 2 of the BER function menu. Press **F1 Resync Condition** to display the Resync Condition function menu and set the automatic resynchronization function for the BER measurement.

Page	Key No.	Menu Display	Function
1	F1	Auto Resync Off <u>On</u>	Specifies whether or not to automatically perform resynchronization when a Sync Loss occurs.
	F2	Threshold X 200	Specifies the number of bits to determine if Sync Loss occurs (numerator).
	F3	Threshold Y 500 bits	Specifies the number of bits to determine if Sync Loss occurs (denominator).
	F4	at SyncLoss <u>Clear</u> Keep	Specifies whether or not to clear the measurement results when a Sync Loss is detected.

Table 8.3.5-1 Resync Condition Function Menu

Details of Auto Resync

There are differences between Auto Resync On and Off.

Auto Resync On:

After establishing synchronization, if errors are more than the specified threshold values, then it is determined that SyncLoss occurred. The measurement stops, and resynchronization is performed. If thresholds are set to 200/500 (Default), and error bits are less than 200 of 500 bits, then it is not determined that SyncLoss occurred and the measurement continues.

To measure signals with high error rate, you can avoid SyncLoss in a condition where a block error occurs due to fading by specifying the thresholds to high values such as 200/500.

To measure signals with low error rate, you can immediately detect SyncLoss and perform resynchronization when an error occurs by specifying the thresholds to low values such as 50/500.

Auto Resync Off:

SyncLoss is not detected during measurement. Signals with high error rate can be measured without interruption. However, when clock is not reproduced at the DUT-side, the clock and data may not be synchronized. In this case, use AutoReEsync On for measurement. Measured error rates and the corresponding recommended settings are as follows:

Value	AutoResync On		AutoDeeuroe
Measured error rate	Threshold Value 50/500	Threshold Value 200/500	AutoResync Off
Less than 0.3%	Optimal setting	Measurable	Measurable
0.3% or more	\checkmark	Optimal setting	Measurable

 Table 8.3.5-2
 Measured Error Rates and Recommended Settings

 $\sqrt{}$ SyncLoss may occur frequently.

Reference:

The default threshold values of the MG3700A:	200/500
The specified threshold values of the MP1201C:	200/512
The default threshold values of the MD6420A:	200/512
The specified threshold values of the MT8820A (WCD	MA) BER
function:	23/64

There are differences between Auto Resync on the MG3710A/MG3710E/MG3740A and Auto Sync on the MP1201C or MD6420A.

Details of Auto Resync on the MG3710A/MG3710E/MG3740A

Auto Resync on the MG3710A/MG3710E/MG3740A behaves as follows:

Auto Resync On

The MG3710A/MG3710E/MG3740A performs synchronization when it starts measurement. It starts measurement after the synchronization is established. After the measurement starts, the

MG3710A/MG3710E/MG3740A automatically performs resynchronization when it detects SyncLoss.

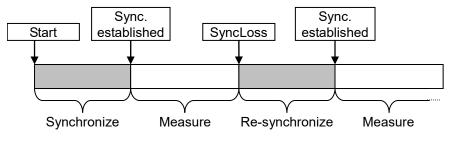


Figure 8.3.5-1 Auto Resync On

Auto Resync Off

The MG3710A/MG3710E/MG3740A performs synchronization when it starts measurement. It starts measurement after the synchronization is established. SyncLoss is not detected during measurement.

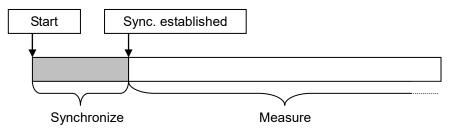


Figure 8.3.5-2 Auto Resync Off

Details of Auto Sync on the MP1201C or MD6420A

Auto Sync on the MP1201C or MD6420A behaves as follows:

Auto Sync On

The MP1201C or MD6420A performs synchronization when it starts measurement. It starts measurement after the synchronization is established. After the measurement starts, the MP1201C or MD6420A automatically performs resynchronization when it detects SyncLoss.

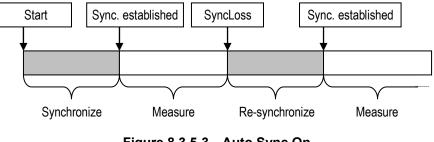


Figure 8.3.5-3 Auto Sync On

Auto Sync Off

The MP1201C or MD6420A assumes synchronization is established when it starts measurement. SyncLoss is not detected during measurement.

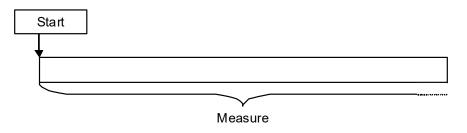


Figure 8.3.5-4 Auto Sync Off

	Note:		
	To get BER c	curve, set Auto Sync to On and establish	
	synchronizat	ion in good S/N condition, and then change Auto Sync	
	-	rform measurement with varying S/N.	
Auto Resync			
	Aux Fctn or Top>→>Auxiliary, >BER>→>Resync Condition>Auto		
	Resync		
	Enables/disables the automatic resynchronization.		
	Press F1 Auto Resync on the Resync Condition function menu to select		
	operations of resynchronization when Sync Loss occurs.		
	On	Automatically performs	
		resynchronization(Default).	
	Off	Does not automatically perform	
		resynchronization.	
Remote command	Enable/disable the automatic resynchronization		
	Command		
	[:SENSe]:BERT[:BASeband]:RSYNc[:STATe] <boolean></boolean>		
	Query [:SENSe]:BERT[:BASeband]:RSYNc[:STATe]? Response		
	<boolean></boolean>	0 or 1	
	(00010all)		
	Parameter		
	<boolean></boolean>	Set the automatic resynchronization	
	ON 1	Automatically performs resynchronization	
		(Default).	
	OFF 0	Does not automatically perform	
		resynchronization.	
	Programming Examing	-	
	To set automatic resynchronization to On.		
	BERT:RSYN ON		

BERT:RSYN ON BERT:RSYN? > 1

Conditions for detecting Sync Loss: Threshold X, Threshold Y

Threshold X

Aux Fein or Top>→>Auxiliary, >BER>→>Resync Condition> Threshold X

Sets conditions for detecting Sync Loss of the BER measurement. Set values of X and Y so that when X bits in Y bits become error, it is determined that SyncLoss occurred.

Press **F2 Threshold X** on the Resync Condition function menu to set a value of X in the **Threshold X** dialog box.

This function is available when Auto Resync is **On**.

Table 8.3.5-3 Setting Range

Setting range	1 bit to (Y/2) bits
Resolution	1 bit
Default	200 bits

Threshold Y

Aux Feat or Top>→>Auxiliary, >BER>→>Resync Condition> Threshold Y

Press **F3 Threshold Y** on the Resync Condition function menu to select a value of Y on the Threshold function menu.

This function is available when Auto Resync is On.

Options 500 bits (Default), 5000 bits, 50000 bits

Remote command

nd Set conditions for detecting Sync Loss of the BER measurement Command

[:SENSe]:BERT[:BASeband]:RSYNc:THReshold
<ext_integer>,500|5000|50000

Query

[:SENSe]:BERT[:BASeband]:RSYNc:THReshold?

Response

<ext_integer>, <Y>

Parameter

<ext_integer></ext_integer>	Numerator of the threshold
Based on Table 8.3.5-3 '	'Setting Range".
<¥>	Denominator of the threshold
500	500 bits (Default)
5000	5000 bits
50000	50000 bits

Programming Example

To set conditions for determining Sync Loss to 123/500 bits. BERT:RSYN:THR 123,500 BERT:RSYN:THR? > 123,500

Operations when detecting Sync Loss: at SyncLoss

AUX Feth or Top>>>>Auxiliary, >BER>>>>Resync Condition>at SyncLoss Specifies to clear or hold the measurement results when a SyncLoss is detected. Press F4 at SyncLoss on the Resync Condition function menu to select a parameter. This function is available when Auto Resync is On. Clear Clears the measurement results(Default). Holds the measurement results. Keep **Remote command** Specify to clear or hold the measurement results when a SyncLoss is detected Command [:SENSe]:BERT[:BASeband]:RSYNc:COUNt:ACTion CLEar | KEEP Query [:SENSe]:BERT[:BASeband]:RSYNc:COUNt:ACTion? Response <mode> CLE or KEEP Parameter <mode> **Operation mode** CLEar Clears the measurement results (Default). KEEP Holds the measurement results. Details This function is available when Auto Resync is On.

Programming Example
To clear the count value when a Sync Loss occurs.
BERT:RSYN:COUN:ACT CLE
BERT:RSYN:COUN:ACT?
> CLE

8.3.6 BER Interface

AUX or Top> \rightarrow >Auxiliary, >BER> \rightarrow >BER Interface

Sets input signals for the BER measurement. Press > to display page 2 of the BER function menu. Press **F2 BER Interface** to display the BER Interface function menu to set an input interface for the BER measurement. You can set the input interface during measurement.

Page	Key No.	Menu Display	Function
1	F1	Clock Edge Fall <u>Rise</u>	Specifies an enabled edge for Clock.
	F2	Data Polarity Negative <u>Positive</u>	Specifies a polarity of the Data connector.
	F3	Enable Active Disable	Specifies a polarity of the Enable connector and whether or not to use it.

Table 8.3.6-1 BER Interface Function Menu

Clock Edge

	Auxiliary, >BER>→>Resync Condition> BER		
	Interface>Clock Edge		
	Sets a detection edge for Clock signals.		
	Press F1 Clock Edge on the BER Interface function menu to select a		
	parameter.		
	Rise Detects Data at the rising edge of Clock signals(Default).		
	Fall	Detects Data at the falling edge of Clock signals.	
Remote command	Set a detection edge	for Clock signals	
	Command		
	:INPut:BERT[:BASe	eband]:CLOCk:POLarity POSitive NEGative	
	Query		
	:INPut:BERT[:BASeband]:CLOCk:POLarity?		
	Response		
	<mode></mode>	POS or NEG	
		I OO OI NOO	

8.3 Performing BER Measurement

	Parameter		
	<mode></mode>	Detection edge of Clock signals	
	POSitive	Detects Data at the rising edge of Clock signals	
		(Default).	
	NEGative	Detects Data at the falling edge of Clock signals	
	Programming Ex	ample	
		ct Data at the rising edge of Clock signals.	
	INP:BERT:CLOC		
	INP:BERT:CLOC		
	> POS		
Data Polarity			
	AUX Fctn or Top> -	>Auxiliary, >BER>>>>Resync Condition> BER	
	Interface>Data P	olarity	
	Sets the logic for	Data signals.	
	Press F2 Data Po	larity on the BER Interface function menu to select a	
	parameter.		
	Positive	Sets the logic for Data signals to positive logic (Default).	
	Negative	Sets the logic for Data signals to negative logic.	
Remote command	Set the logic for	Data signals	
	Command		
	:INPut:BERT[:]	BASeband]:DATA:POLarity POSitive NEGative	
	Query		
	:INPut:BERT[:]	BASeband]:DATA:POLarity?	
	Response		
	<mode></mode>	POS or NEG	
	Parameter		
	<mode></mode>	Logic for Data signals	
	POSitive	Positive logic (Default)	
	NEGative	Negative logic	
	Programming Ex	ample	
	To set the polarit	y for Data signals to positive logic.	
	INP:BERT:DATA:POL POS		
	INI . DEINI . DAIA		
	INP:BERT:DATA	:POL?	

Enable Active

Remote

ive				
	AUX Fetn or Top>	→>Auxiliary, >BER>→>Resync Condition> BER		
	Interface>Enable Active			
	Sets the logic for	Enable signals of the BER measurement.		
	Press F3 Enable	Active on the BER Interface function menu to select a		
	value on the Ena	ble Active function menu.		
	Disable	Does not use Enable signals(Default).		
	High	Measures the signals when High input.		
	Low	Measures the signals when Low input.		
command	Set the logic for Enable signals of the BER measurement			
	Command			
	:INPut:BERT[:BASeband]:CGATe:POLarity			
	POSitive NEGa	tive DISable		
	Query			
	:INPut:BERT[:	BASeband]:CGATe:POLarity?		
	Response			
	<mode></mode>	POS, NEG, or DIS		
	Parameter			
	<mode></mode>	Logic for Enable signals		
	DISable	Does not use Enable signals (Default).		
	POSitive	Measures the signals when High input.		
	NEGative	Measures the signals when Low input.		
		annula.		

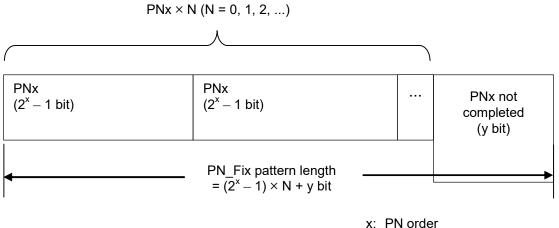
Programming Example

To perform measurement when Enable signals are High input. INP:BERT:CGAT:POL POS INP:BERT:CGAT:POL? > POS

8.4 PN Fix Pattern

For the BER measurement, you can use special PN patterns known as PN_Fix patterns.

The PN_Fix pattern is a pattern consisting of repeated parts of PN patterns and PN patterns with length shorter than 1 cycle.



x: PN order N: Repetition count of PNx

Figure 8.4-1 PN_Fix Pattern

Setting PN_Fix Pattern: PN Fix Pattern 8.4.1

AUX Fctn or Top> >> Auxiliary, >BER>PN Fix Pattern Sets a PN_Fix pattern.

A PN_Fix pattern can be set when PN9Fix, PN11Fix, PN15Fix, PN20Fix, or PN23Fix is selected for Data Type.

Press F7 PN Fix Pattern on the BER function menu to display the PN Fix Pattern function menu and set a PN Fix pattern.

Page	Key No.	Menu Display	Function
1	F1	Initial 1FF	Specifies an initial value of PN Pattern for PN Fix.
	F2	Length 96 Bits	Specifies a length of 1 cycle in bit unit for PN Fix.

Table 8.4.1-1 PN Fix Pattern Function Menu

Initial Pattern

Auxiliary, >BER>PN Fix Pattern>Initial Pattern Sets an initial pattern of PN_Fix patterns.

Press F1 Initial Pattern on the PN Fix Pattern function menu to set an initial pattern of PN_Fix patterns in the Initial Pattern dialog box.

Table 8.4.1-2	Initial Pattern Setting Value
---------------	-------------------------------

Dete Ture	Initial Pattern Setting Range	Resolution	Default	
Data Type	Binary He		Resolution	Default
PN9Fix	000000000 to 11111111 (9 bits)	000 to 1FF	1	1FF
PN11FIx	0000000000 to 111111111 (11 bits)	000 to 7FF	1	7FF
PN15Fix	000000000000000 to 1111111111111 (15 bits)	0000 to 7FFF	1	7FFF
PN20Fix	00000000000000000000000000000000000000	00000 to FFFFF	1	FFFFF
PN23Fix	00000000000000000000000000000000000000	000000 to 7FFFFF	1	7FFFFF

<Cautions for setting PN_Fix>

When you set all initial values of PN_Fix pattern to 0, the following

signals are output:

PN9Fix, PN11Fix, or PN20Fix: ALL0 signals PN15Fix or PN23Fix: ALL1 signals

8-36

Remote command

Set an initial pattern of PN_Fix patterns Command

[:SENSe]:BERT[:BASeband]:PRBS:PNFix:INITial <binary>

Query

[:SENSe]:BERT[:BASeband]:PRBS:PNFix:INITial?

Response

<binary>

Parameter

<binary>
Based on Table 8.4.1-2 "Initial Pattern Setting Value".

Details

You can set patterns using this function only when PN Fix pattern is selected for Data Type. Add the character string "#B", which indicates binary, before the parameter.

Programming Example

To set an initial value of PN9 Fix to "101010101". BERT:PRBS:PNF:INIT #B101010101 BERT:PRBS:PNF:INIT? > 101010101

Pattern length: Length

Auxiliary, >BER>PN Fix Pattern>Length

Sets a length of PN_Fix patterns.

Press **F2 Length** on the PN Fix Pattern function menu to set a length of PN_Fix patterns in the **Length** dialog box.

Table 8.4.1-3Setting Range

Setting range	96 bits to 134217728 bits (0x8000000)
Resolution	1 bit
Default	96 bit

Remote command

Set a length of PN_Fix patterns Command

[:SENSe]:BERT[:BASeband]:PRBS:PNFix:LENGth <ext_integer>

Query

[:SENSe]:BERT[:BASeband]:PRBS:PNFix:LENGth?

Response

<ext_integer>

Parameter

<ext_integer> Based on Table 8.4.1-3 "Setting Range".

Details

You can set patterns using this function only when PN Fix pattern is selected for Data Type.

Programming Example

To set a bit length of PN Fix patterns to 1024 bits. BERT:PRBS:PNF:LENG 1024 BERT:PRBS:PNF:LENG? > 1024

8.4.2 Synchronization establishing conditions of PN_Fix patterns

This section describes synchronization establishing conditions of PN_Fix patterns.

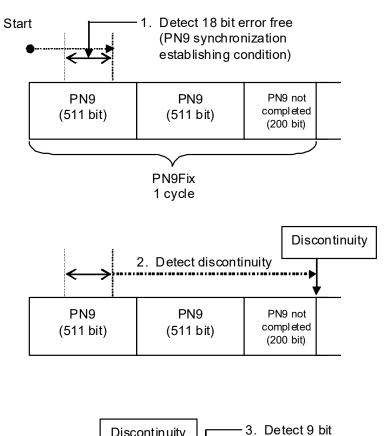
Assumptions: x: PN order(If PN9, x = 9)

Synchronization is established in 3 phases:

- 1. Establish synchronization with PN patterns by detecting $(x \times 2)$ bit error free.
- 2. Detect the last bit of PNxFix pattern from the initial bit pattern length of the specified PN pattern.
- 3. Establish synchronization with PN_Fix pattern overall by detecting x bit error free from the start PN_Fix pattern.

For example, synchronization establishing of PN9Fix pattern is as follows:





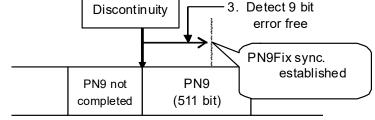


Figure 8.4.2-1 Example: Synchronization Establishing of PN9Fix Pattern

8.4.3 Examples of using PN_Fix patterns

This section describes examples of how to use PN_Fix patterns.

Imagine that a communication system has a frame format shown in Figure 8.4.3-1, in which the fixed bit A is 10 bits and the communication channel B is 1000 bits.

When the communication channel uses PN9, the number of bits per frame (1000 bits) does not match with the cycle of PN9 (511 bits). Therefore, the cycle must be 511 frames to keep continuity of PN 9 signals of the communication channel.

However, on a signal generator using a waveform generator like the MG3710A/MG3710E/MG3740A, increasing frames and samples of waveform patterns may decrease patterns stored in the waveform memory, or may cause over capacity of waveform memory.

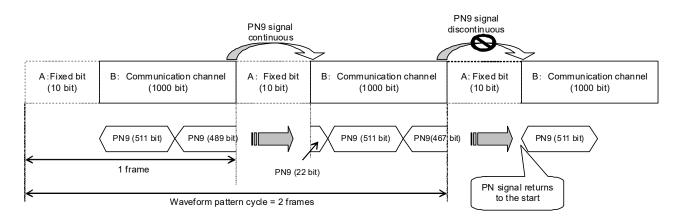


Figure 8.4.3-1 Example: PN9Fix Patterns

In such a case, to perform the BER measurement for PN9 signals that discontinues in the frame shown in Figure 8.4.3-1, use short-cycle signals, for example, 2-frame cycles generated by IQproducerTM shown in Figure 8.4.3-2, and select PN Fix pattern for Data Type.

Refer to an operation manual of each IQproducerTM for how to set PN_Fix signals on IQproducerTM.

When PN_Fix signals are used for measurement, pseudorandom signals lose some of their randomness.

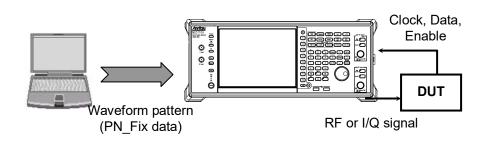


Figure 8.4.3-2 BER Measurement with PN_Fix Data

8.5 User Defined Pattern

The BER measurement can use a pattern created by a user, which is called a user defined pattern.

A user defined pattern is an arbitrary binary string that is 8 to 1024 bit length and that consists of a data bit string to determine if synchronization is established and a data bit string used as measurement data. Refer to 8.5.2 "Setting user defined patterns: User Pattern" for how to specify bits to determine if synchronization is established.

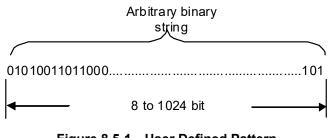


Figure 8.5-1 User Defined Pattern

You can create user defined patterns in text file formats using PCs. Load the file from USB memories or internal hard disks of the MG3710A/MG3710E/MG3740A. Following the explanation below, create a file and specify "*.bpn" as an extension.

Table 8.5-1 lists items that can be included in user defined patterns.

C	haracter	Description	
0, 1	Single-byte number	Loaded as bit data. Characters, including numbers, spaces, and CR/LF must be continuous.	
Space	Single-byte space	Used for improving readability when editing bit data.	
New line	CR/LF	Used for improving readability when editing bit data.	
#	Single-byte #	Indicates comments.	

Table 8.5-1 Items to Be Included in User Defined Patterns

For example, a file can have following content:

Example 1:

#20070216 Marked by Anritsu Co. 0010 0111 0110 0011 0000 1111 0101

Example 2:

#UserPattern Start 0000 0000 1111 1111 #mark001 0101 0101 #mark002 1111 1111 0000 0000

8.5.1 Displaying user defined patterns

▲ or Top> →> Auxiliary, >BER>User Pattern
To use user defined patterns, press F6 Data Type on the BERTEST function menu and select F6 User Defined on page 2 of the BERDataType function menu.

When you press **F8 User Pattern**, loaded parameters of user defined patterns are displayed in the **BERT User Defined Pattern** dialog box on the main screen. When no user defined pattern is loaded, "--" is displayed.

BERT User Define	d Pattern	
		001 - 128 bit 129 - 256 bit 257 - 384 bit 385 - 512 bit 513 - 640 bit 641 - 768 bit 769 - 896 bit 897 - 1024 bit
Pattern File Name	<no file=""></no>	
Pattern Length	0 Bits	
Sync Position Start	1 Bit	
Sync Position Length	32 Bits	

Figure 8.5.1-1 BERT User Defined Pattern Dialog Box

- 1. Pattern File Name
 - Indicates a loaded User Pattern name.
- 2. Pattern Length Indicates a loaded User Pattern length (number of bits).
- Sync Position Start Indicates a bit at which synchronizing User Patterns starts. Refer to 8.5.2 "Setting user defined patterns: User Pattern".
- Sync Position Length
 Indicates a length (number of bits) at which matching is performed
 for synchronizing User Pattern.
 Refer to 8.5.2 "Setting user defined patterns: User Pattern".
- User Defined Pattern Displays content of loaded User Pattern in hexadecimal formats.

Pattern File Name	Displays a loaded user defined pattern name of the BER measurement.		
Remote command	Query a loaded user defined pattern name of the BER measurement Query [:SENSe]:BERT[:BASeband]:PRBS:USER:PATTern?		
	Response <pattern>,<drive></drive></pattern>		
	Details If there is no user de	fined pattern file, the command returns ***.	
	Parameter		
	<pattern></pattern>	User defined pattern file name Character string within 100 characters, excluding an extension (bpn)	
	<drive></drive>	Drive name where the user defined pattern file is loaded	
	Programming Exam	ple	
	To query a user defined pattern name. BERT: PRBS: USER: PATT?		
	<pre>> TEST1,D Response when a cor > ***</pre>	responding pattern does not exist:	
Pattern Length			
	Displays a pattern le measurement.	ength of a user defined pattern for the BER	
Remote command	measurement Query	ength of a user defined pattern for the BER ASeband]:PRBS:USER:LENGth?	
	Response <integer></integer>		
	Parameter		
	<integer></integer>	Pattern length of the user defined pattern	
	Range	8 to 1024 bits	

Programming Example

To query the pattern length of the user defined pattern. BERT:PRBS:USER:LENG? > 1024

Bit string of user defined pattern: User Defined Pattern

Displays a bit string of a user defined pattern for the BER measurement.

Remote command	Query a bit string of a user defined pattern for the BER measurement	
	Query	
	[:SENSe]:BERT[:BASeband]:PRBS:USER:BIT?	

Response

<binary>

villary>

Parameter

<binary></binary>	Bit string of the user defined pattern
Range	Pattern from 8 to 1024 bits

Details

If the language mode is MS269xA, the "#B" is not added at the start. If there is no user defined pattern, the command returns #B***. *Note:*

1024 "0"s are inserted at ***.

Programming Example

To query the bit string of the user defined pattern. BERT:PRBS:USER:BIT? > #B001011101000101

8.5.2 Setting user defined patterns: User Pattern

AUX or Top> >> Auxiliary, >BER>User Pattern

Loads and sets user defined patterns.

Select **User Defined** on the Data Type function menu, and then press **F8 User Pattern**. The User Pattern function menu is displayed and you can set user defined patterns.

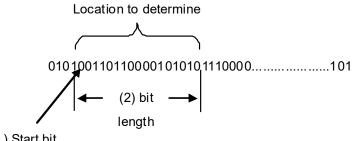
Page	Key No.	Menu Display	Function
1	F1	Sync Start 1	Specifies the start bit to determine if synchronization of user defined patterns is established.
	F2	Sync Length 32	Specifies a length to determine if synchronization of user defined patterns is established.
	F7	Open	Loads user defined patterns. Refer to 8.5.3 "Loading user defined patterns: Open".

Table 8.5.2-1 User Pattern Function Menu

Setting synchronization establishing conditions of user defined patterns

Sets a synchronization establishing condition after loading a user defined pattern file.

Specify a start bit and a bit length to determine if synchronization is established. When error free is detected at the locations specified here, it is determined that synchronization is established.



(1) Start bit

Figure 8.5.2-1 Specifying the Location to Determine if Synchronization Is Established

Setting the start bit: Sync Start

AUX or Top> >> Auxiliary, >BER>User Pattern>Sync Start

Sets the start bit of the part for judging the synchronization establishment.

Press **F1 Sync Start** on the User Pattern function menu to set a length to set the start bit of the part for judging the synchronization establishment in the **Sync Start** dialog box.

Table 8.5	.2-2 Sett	ing Range

Setting	1 bit to (Pattern Length) bit	
range		
Resolution	1 bit	
Default	1 bit	

Remote command Set the start bit to determine if synchronization is established

Command

[:SENSe]:BERT[:BASeband]:PRBS:USER:SYNC:STARt
<ext integer>

Query

[:SENSe]:BERT[:BASeband]:PRBS:USER:SYNC:STARt?

Response

<ext_integer>

Parameter

<ext_integer> Based on Table 8.5.2-2 "Setting Range".

Details

You can set the start bit using this function only when User Defined is selected for Data Type.

Programming Example

To set the 31st bit from the start of the user defined pattern as the start of the bit string to determine if synchronization is established. BERT:PRBS:USER:SYNC:STAR 31 BERT:PRBS:USER:SYNC:STAR? > 31

Sync Length

Auxiliary, >BER>User Pattern>Sync Length

Sets a length to determine if synchronization is established. Press **F2 Sync Length** on the User Pattern function menu to set a length to determine if synchronization is established in the **Sync Length** dialog box.

Table 8	.5.2-3	Setting	Range
---------	--------	---------	-------

Setting	8 bits to 1024 bits
range	
Resolution	1 bit
Default	32 bit

Remote command

Command

[:SENSe]:BERT[:BASeband]:PRBS:USER:SYNC:LENGth
<ext integer>

Set a length to determine if synchronization is established

Query

[:SENSe]:BERT[:BASeband]:PRBS:USER:SYNC:LENGth?

Response

<ext_integer>

Parameter

<ext_integer> Based on Table 8.5.2-3 "Setting Range".

Details

You can set the length using this function only when **User Defined** is selected for Data Type.

Programming Example

To specify 65 bit as a length of the user bit string to determine if synchronization is established. BERT:PRBS:USER:SYNC:LENG 65 BERT:PRBS:USER:SYNC:LENG? > 65

8.5.3 Loading user defined patterns: Open					
•	AUX Fctn or Top>(→)>A	- uxiliary, >BER>User Pattern>Open			
		terns for the BER measurement.			
	Place user defined pattern files directly below the specified USB				
	memories or Hard Disk (internal hard disk) (Root) or [Device]:\Anritsu\MG3710A\User Data\BERT BitPattern\.				
Remote command	Load a user defined pa	attern			
	Command				
	:MMEMory:LOAD:BER	I:PATTern <string>[,<device>]</device></string>			
	Parameter				
	<string></string>	File name excluding extension			
		Character string within 100 characters enclosed			
		by double quotes (" ") or single quotes (' ')			
		(excluding extension)			
	<device></device>	Number of the drive			
	Options	A to Z, currently selected drive when omitted			
	Details				
	Only a file with the ext	tension ".bpn" can be loaded.			
	If a corresponding user	r defined pattern file does not exist, the command			
	returns an error.				
	Programming Example	e			
		d pattern file "USERPATTERN.bpn" from D drive. IT "USERPATTERN", D			
Remote command	Load a list of user defi	ined pattern files			
	Query				
	:MMEMory:LIST:BERT:PATTern? [<device>]</device>				
	Response				
	<s1>,<s2>,<s3></s3></s2></s1>	, <s999>,<s1000></s1000></s999>			
	Parameter				
	<device></device>	Number of the drive			
	Options	A to Z, currently selected drive when omitted			
	<s1>,,<s1000></s1000></s1>	Existing user defined pattern file names			
		(up to 1000) Within 100 characters			

Details

If there is no user defined pattern file, the command returns ***. Files are listed alphabetically in a response message.

Programming Example

To load a list of user pattern files in C drive for the BER measurement. MMEM:LIST:BERT:PATT? > TEST1,TEST2,TEST3

Operation method Lo

Load a user defined pattern.

 Press F7 Open on the User Pattern function menu to display the User Pattern Open function menu, File List, and the User Pattern Open dialog box.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Specifies a drive of the device containing user patterns to select.
	F7	Open	Loads user defined pattern files.
	F8	Cancel	Returns to the previous menu.

Table 8.5.3-1 User Pattern Open Function Menu

- 2. Press **F1 Device** to select a device containing the user defined pattern files to load.
- Select user defined pattern files to load from File List and press F7 Open.

	Userdata111221_000	
User Pattern Open		
File List		
Path : C:\Anritsu\MG3	710A\User Data\BERT BitPattern\	
Name		
Userdata111221_000		
<u>Userdata111221_000</u> Userdata111221_001		

Figure 8.5.3-1 User Pattern Open Dialog Box and File List

When selecting files, only files with the extension "bpn" are displayed.

Place user defined pattern files in: [Device]:\Anritsu\MG3710A\User Data\BERT BitPattern\ File names are listed in alphanumeric order. If no user defined pattern file exists, "File not found" is displayed. If no user defined pattern file exists, the "No file to read" is displayed. If the length of user defined patterns are out of available range, the following errors are displayed: Less than 8 bits : "Bit pattern is too short." More than 1024 bits : "Bit pattern is too long." If user defined pattern files include characters other than "0", "1", or CR/LF, or comments starting with #, then "Illegal character exists." is displayed.

8.6 BER Log

AUX or Top> \rightarrow >Auxiliary, >BER> \rightarrow >Show Log

Displays the past results of the BER measurement and saves them as files.

Press \bigcirc to display page 2 of the BER function menu and press **F3 Show Log** to display BER Test Log. You can display up to 1000 logs. The BER Log function menu is displayed, too.

Logs are displayed in the following format:

	1	2	3	4	5	6	7	
	- I		- I.	- I	- I	- I -	- I	
	BER Test Log							
	Date	Status	Mode	Error Rate	Error Count	Bit Count	Sync Loss	1
▶ 1	2011/12/26 13:48:34	ок	Continuous #1	1.400E-002	14	1000	0	
2	2011/12/26 13:48:34	ОК	Continuous #2	1.400E-002	14	1000	0	
3	2011/12/26 13:48:35	OK	Continuous #3	1.000E-002	10	1000	0	
4	2011/12/26 13:48:35	ок	Continuous #4	1.000E-002	10	1000	0	
5	2011/12/26 13:48:36	ок	Continuous #5	1.100E-002	11	1000	0	1
6	2011/12/26 13:48:36	ОК	Continuous #6	1.200E-002	12	1000	0	
7	2011/12/26 13:48:36	ок	Continuous #7	1.200E-002	12	1000	0	
8	2011/12/26 13:48:37	ок	Continuous #8	1.000E-002	10	1000	0	
9	2011/12/26 13:48:37	ок	Continuous #9	8.000E-003	8	1000	0	
10	2011/12/26 13:48:37	ок	Continuous #10	8.000E-003	8	1000	0	
11	2011/12/26 13:48:38	ОК	Continuous #11	6.000E-003	6	1000	0	
12	2011/12/26 13:48:38	ОК	Continuous #12	4.000E-003	4	1000	0	
13	2011/12/26 13:48:38	ОК	Continuous #13	4.000E-003	4	1000	0	1
14	2011/12/26 13:48:39	ОК	Continuous #14	5.000E-003	5	1000	0	1
15	0011 /10 /06 19.40.90	OF	Continuous #15	6 000E-009	6	1000	0	1
<u> </u>								2

Figure 8.6-1 BER Test Log

No.	ltem	Description	
1	Date	Indicates the time when the measurement ended.	
2	Status	Indicates the reason why the measurement ended.	
3	Mode	Indicates the mode when the measurement was performed (Continuous, Single, or Endless).	
4	Error Rate	Indicates an error rate in index.	
5	Error Count	Indicates the number of error bits.	
6	Bit Count	Indicates the number of measurement bits.	
7	Sync Loss	Indicates a SyncLoss count (only for Auto Resync On).	

Table 8.6-1 Display Items of BER Test Log

Display	Description
ОК	Indicates that the specified bits or error bits were exceeded and the test completed successfully.
STOP	Indicates that you pressed F2 Stop BER Test to stop the measurement or specified parameters and the measurement stopped.
OVERFLOW_ DATACOUNT	Indicates that the measurement bits exceeded the maximum value and the measurement stopped.
OVERFLOW_ SYNCLOSS	Indicates that the SyncLoss count exceeded the maximum value and the measurement stopped.
ABNORMAL_ COUNT	Indicates that a malfunction of the BER measurement circuit resulted in the measurement stop.
CLEAR	Indicates that you pressed F3 Clear BER Count to clear the measurement value. This does not mean the measurement stopped.

Table 8.6-2 End Reasons

Remote commands for items in BER Test Log are as follows:

BER Test Log

Queries logs of the BER measurement results.

Remote command Query logs of the BER measurement results Query [:SENSe]:BERT[:BASeband]:LOG? <ext_integer>

Response

<string>

Parameter

<ext_integer></ext_integer>	Log No.
Range	1 to log count
<string></string>	The Log Date, Time, Status, Measure mode,
	Error Rate, Error Count, Bit Count, and Sync
	Loss for the specified number are output
	according to Figure 8.6-1 BER Test Log.

Programming Example

To	o query log #11	of the BER measurement.
BI	ERT:LOG? 11	
>	2011/09/01	10:35:42,OK,Continuous,1.800E-002,18,1000,0

Chapter 8 BER Measurement

BER Test Log Count

Queries a count of logs for the BER measurement results.

Remote command Query a count of logs for the BER measurement results Query [:SENSe]:BERT[:BASeband]:LOG:COUNt?

Response

<integer>

Parameter

<integer> Range Count of logs for the measurement results 0 to 1000

Details

This function is available only for remote commands.

Programming Example

To query a count of logs for the BER measurement results. BERT:LOG:COUN? > 1000

Table 8 6-3	BER Log Function Menu
1 abie 0.0-5	DER LOG I UNCLION MENU

Page	Key No.	Menu Display	Function
1	F1	Clear	Deletes logs stored in the memory. Turning the power of the MG3710A/MG3710E/MG3740A off also deletes logs. Refer to 8.6.1 "Deleting BER logs: Clear".
	F8	Save	Saves BER Test Log as a file in the text format. Refer to 8.6.2 "Saving BER logs: Save".

8.6.1 Deleting BER logs: Clear

image: state of the series for the series of the seri

[:SENSe]:BERT[:BASeband]:LOG:CLEar

Programming Example

To delete logs stored in the memory. BERT:LOG:CLE

Chapter 8 BER Measurement

8.6.2 Saving BER logs: Save

	Auxiliary, >BER> \rightarrow >Show Log>Save Saves logs of the BER measurement as a text file. The latest 1000 logs are kept. Logs are not stored in HDD unless			
	SaveLog is performed.	Therefore, turning the power off deletes the data.		
Remote command	Save logs of the BER measurement as a text file			
	Command			
	:MMEMory:STORe:BEN	RT:LOG [<string>[,<device>]]</device></string>		
	Parameter			
	<string></string>	File name excluding extension		
		Character string within 100 characters enclosed		
		by double quotes (" ") or single quotes (' ')		
		(excluding extension)		
		The following characters cannot be used:		
		\ / : * ? `` " \ / < >		
		Automatically named as		
		"Bert_[Date]_[Additional number].log" when		
		omitted.		
		The additional number will be the minimum		
		three-digit numerical number within 000 to 999		
		which does not exist.		
	<device></device>	Number of the drive		
	Options	A to Z, currently selected drive when omitted		

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\BERT Log\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To name a BER Log file as "BER123" and saves it in D drive. <code>MMEM:STOR:BERT:LOG</code> "BER123", D

Operation method Example: To name a log file of the measurement results as "ABC" and save it

1. Press **F8 Save** on the BER Log function menu to display the BER log Save function menu, File List in the function information frame, and the **BER Log Save** dialog box in the active function frame.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Specifies a drive of the device to save BER Test Log.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F5	Delete	Deletes BER Test Log files.
	F7	Save	Saves BER Test Log as a file.
	F8	Cancel	Returns to the previous menu.

Table 8.6.2-1 BER Log Save Function Menu

- 2. Press **F1 Drive** to select a destination drive for the file.
- 3. In the **BER Log Save** dialog box, enter "ABC" as a name of BER Log file and press **F7 Save** to save the log.

!!	ABC	
BER Log Save	▲ BC DE FG H I J K L M NO PQ R S T U V W X Y Z , . @ a b c d e f g h i j k l m no p q r s t u v w x y z ; ' ~ 0 1 2 3 4 5 6 7 8 9 ! # \$ \$ & () + - = [] ^ {]	
File List		
Path : C:\Anritsu\MG3710A\L	Jser Data\BERT Log\	
Name		
Bert20111222_000		
Bert20111222_001		
Bert20111222_002		
Bert20111222_003		

Figure 8.6.2-1 BER Log Save Dialog Box and File List

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Destination path: Anritsu\MG3710A\UserData\BERT Log\
- Default destination name:

Bert_[Date]_[Additional number].csv

The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.

• Characters available for file names are displayed on the character pallet.

		<pre>blowing characters cannot be used: / : * ? `` " ` ' < > </pre>
	• A spa cause	ce or dot "." at the beginning or the end of a file name s a file name error, and the file cannot be saved. 1000 files can be saved in a single folder. Saving more
	than saved	1000 files in a folder cause an error, and the file cannot be
Deleting BER log files: [Delete	
	AUX Fetn or Top> Deletes BER La	→>Auxiliary, >BER>→>Show Log>Save>Delete og files.
Remote command	Delete BER Lo Command :MMEMory:DEI	gfiles Lete:BERT:LOG <string>[,<device>]</device></string>
	Parameter	
	<string></string>	File name excluding extension
		Character string within 100 characters enclosed
		by double quotes (" ") or single quotes (' ')
	<device></device>	(excluding extension) Number of the drive
	Options	A to Z, drive C when omitted
	-	
	Programming	-
		ER Log file "BER123" from D drive. RT:LOG "BER123", D
Operation method	Example: To se	elect and delete BER Log files
		ave on the BER Log function menu to display the BER log
		tion menu, File List in the function information frame, and og Save dialog box in the active function frame.
	2. Press F1 D	Prive to select a destination drive for the file.
		BER Log files to delete from File List. When you press F5 e Confirmation function menu is displayed for your on.

Page	Key No.	Menu Display	Function
1	F7	Confirm Deletion	Deletes files.
	F8	Cancel	Returns to the previous menu.

Table 8.6.2-2 Confirmation Function Menu

4. Press **F7 Confirm Deletion** to delete files.

8.7 About BER Measurement Operations

This section describes the BER measurement operations from synchronization to finishing.

Auto Resync Off:

Overview of the measurement operations when Auto Resync is set to Off is as follows: In this mode, an error rate is checked immediately after synchronization to determine if the synchronization failed. If the error rate immediately after the synchronization is 30% or more, it is determined that the synchronization failed. Resynchronization is performed.



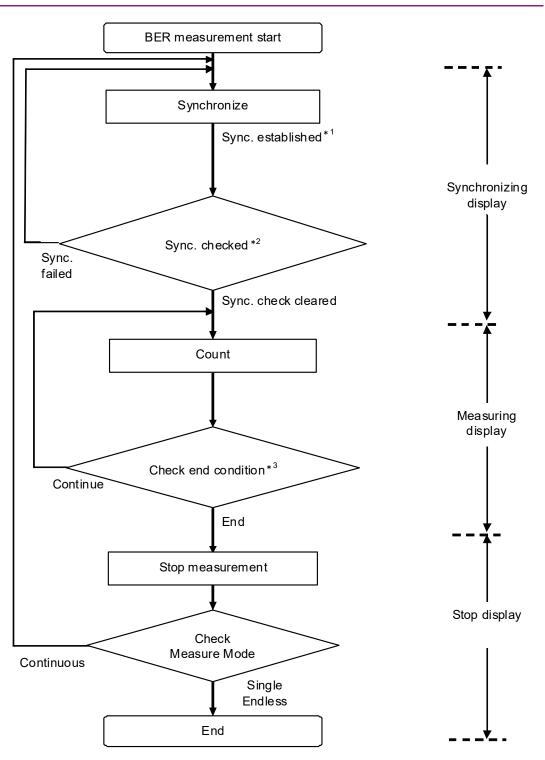


Figure 8.7-1 Auto Resync Off

- *1: If the number of measurement bits is less than 1000 bits and the measurement finishes, an error rate is not checked. The measurement result, therefore, may not be correct.
- *2: If the error rate is 30% or more and the number of measurement bits is 1000 or more, it is determined that synchronization failed.
- *3: The measurement finishes when one of the following conditions is met:
 - The number of measurement bits or measurement error bits reaches the specified number of bits.
 - The number of measurement bits exceeds the maximum value.
 - The SyncLoss count exceeds the maximum value.

Auto Resync On:

Overview of the measurement operations when Auto Resync is set to On is as follows: In this mode, when a SyncLoss occurs, resynchronization is automatically performed.

Chapter 8 BER Measurement

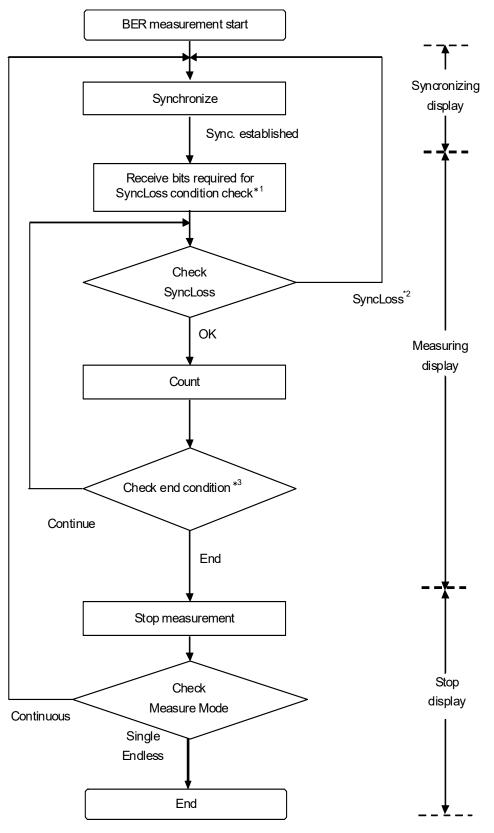


Figure 8.7-2 Auto Resync On

- *1: To check SyncLoss conditions, bits specified with the denominator of SyncLoss Threshold must be received. Therefore, it may take time to start counting after synchronization is established.
- *2: When a SyncLoss occurs, the operation specified with at SyncLoss is performed.
- *3: The measurement finishes when one of the following conditions is met:
 - The number of measurement bits or measurement error bits reaches the specified number of bits.
 - The number of measurement bits exceeds the maximum value.
 - The SyncLoss count exceeds the maximum value.

This chapter describes the Auxiliary and Utility functions, panel keys, touch panel, and how to configure Windows system settings.

Note on remote command:

When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions. Refer to Appendix E.7.6 "Selecting SG1/2" for details.

The MG3710A/MG3710E/MG3740A uses one of the following Microsoft Windows (hereinafter, referred to as "Windows") as the operating system (hereinafter, "OS").

- Windows Embedded Standard 2009 (hereinafter, "WES 2009")
- Windows Professional 7 32 bit ver. (hereinafter, "Win 7")
- Windows Embedded Standard 7 64 bit ver. (hereinafter, "WES 7")
- Windows 10 IoT 64 bit ver. (hereinafter, "Win 10")

9.1	Auxilia	ry Function9-3
9.2	Power	Meter
	9.2.1	Power Meter setting:Channel A/B Setup9-9
	9.2.2	Setting connection to power meters : Connection
		Settings9-11
	9.2.3	Power Meter setting: Channel Settings 9-14
9.3	Alarm	History
	9.3.1	Saving Alarm History: Save
9.4	Utility	Function
	9.4.1	Interface Settings9-26
	9.4.2	System Settings9-30
	9.4.3	Instrument Info9-32
	9.4.4	Install
	9.4.5	Displaying Error Information: Error Info9-49
	9.4.6	Changing Boot Loader Service9-52
9.5	Panel	Keys9-54
	9.5.1	Preset
	9.5.2	Switching Remote/Local: Local9-57
	9.5.3	Saving parameter file: Save
	9.5.4	Recalling Parameter File: Recall
	9.5.5	Screen copy: Copy9-72
	9.5.6	Functions specific to remote commands 9-77
	9.5.7	Calibration9-79
9.6	Touch	Panel
9.7	Setting	g Windows 9-83
	9.7.1	Displaying Windows desktop9-88
	9.7.2	Setting control panel9-89
	9.7.3	Using external display9-92

9.7.4	General notes9-95	
9.7.5	Storage device configuration	
9.7.6	System Recovery Functions	
9.7.7	Windows Security Measures	

9.1 Auxiliary Function

AUXFcth or Top> \rightarrow >Auxiliary

Press **Aux Fctn** on the main function key or **F5 Auxiliary** on page 2 of the top function menu to display the Auxiliary function menu. On this menu, you can set Power Meter, the BER measurement, and Alarm History.

This section describes the Auxiliary function menu.

Page	Key No.	Menu Display	Function
1	F1	Power Meter	Sets Power Meter.
			Refer to 9.2 "Power Meter"
	F2	BER	Performs the BER measurement.
			Refer to Chapter 8 "BER Measurement".
	F4	Alarm History	Saves Alarm History.
			Refer to 9.3 "Alarm History".

Table 9.1-1 Auxiliary Function Menu

9.2 Power Meter

AUX or Top> >> Auxiliary, >Power Meter

You can connect two USB power sensors to the MG3710A/MG3710E/MG3740A, simultaneously control them, and show their measurement values individually.

The two power sensor measurements are displayed at Ch. A and Ch. B of the power meter.

Press **F1 Power Meter** on the Auxiliary function menu to display the **Power Meter Measurements** dialog box and the Power Meter function menu.

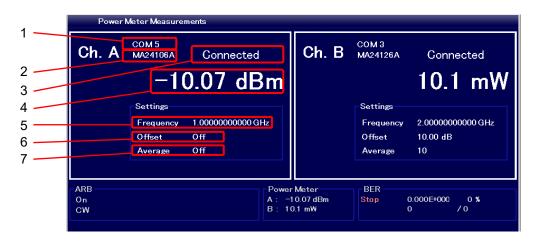


Figure 9.2-1 Power Meter Measurements Dialog Box

		-
No	Display	Description
1	COM	COM Port number
2	Model	Model name of power sensor
3	Connection	Connection status of the power sensorOff:The power sensor is Off.Connected:The power sensor is On andmeasurement is in progress.Disconnected:The power sensor is On andmeasurement is not in progress.(Notconnected)
4	Measurement value	Indicates a measurement result in dBm or W
5	Frequency	Measurement frequency of the power sensor
6	Offset	Offset level value to be added to the power sensor reading
7	Average	Averaging count for the measurement values with the power sensor

 Table 9.2-1
 Power Meter Measurements Dialog Box

Measurement value		
		urement value of a power sensor. When a power sensor s updated constantly. It includes a level offset.
Remote command	Query	sensor measurement display value
	Response	
	<power></power>	"-999.0" is returned when there is no value.
	Parameter	
	<power></power>	Level
	Resolution Details	0.01 dB when dBm, 1 nW when W
	As for node : PME follows:	Ter[1] 2, select Ch. A or B of power meter. Set as
	Ch.A: :PMETer1 Ch.B: :PMETer2	
	Programming Ex	ample
	To measure using SYST: PMET: MEAS	g the Ch. A power sensor and read the result. S?
	> -10.00	

Connection Displays the connection status of power sensor. Off Power sensor is turned off. (Default) Connected Power sensor is turned on and measuring Disconnected Power sensor is turned on but not measuring. (Disconnected) **Remote command** Querying the power sensor connection status Query :SYSTem:PMETer[1] |2:CONNection? Response <connect> Parameter <connect> Connection CONN Connected DISC Disconnected, or OFF Details As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows: Ch.A::PMETer1 or :PMETer Ch. B: : PMETer2 **Programming Example** To query the connection status of the Ch. A power sensor. SYST: PMET: CONN? > CONN

Information about the connection and measurement results are displayed in the resident frame below the function display frame.



Figure 9.2-2 Power Meter in Resident Frame

Table 9.2-2 P	ower Meter in	Resident Frame
---------------	---------------	-----------------------

No	Display	Description
1	A:	Connection status or a measurement value of Ch. A
2	B :	Connection status or a measurement value of Ch. B

Table 9.2-3 Power Meter Function Menu

Page	Key No.	Menu Display	Function
1	F1	Channel A Off On	Enables/disables measurement performed by the Ch. A power sensor.
	F2	Channel A Setup	Channel Setup Refer to 9.2.1 "Power Meter setting: Channel A/B Setup".
	F3	Channel B Off On	Enables/disables measurement performed by the Ch. B power sensor.
	F4	Channel B Setup	Channel Setup Refer to 9.2.1 "Power Meter setting: Channel A/B Setup".

Ch A/B power sensor On/Off: Channel A/B

(AUX) or Top>>>>Auxiliary, >Power Meter>Channel A or Channel B

Enables/disables measurement performed by Ch. A or Ch. B power sensor.

Press F1 Channel A or F3 Channel B to set On/Off.

On	Measures.
Off	Does not measure (Default).

Remote command Enable/disable measurement performed by Channel A or Channel B power sensor Command

:SYSTem:PMETer[1]|2[:STATe] <boolean>

Query

:SYSTem:PMETer[1] |2[:STATe]?

Response

<boolean> 0 or 1

Parameter

<boolean></boolean>	Measurement On/Off
ON 1	Measures.
OFF 0	Does not measure (Default).

Details

As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To enable measurement performed by Channel B. SYST:PMET2 ON SYST:PMET2? > 1

9.2.1 Power Meter setting: Channel A/B Setup

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup

Press **F2 Channel A Set up** or **F4 Channel B Setup** on the Power Meter function menu to display the Ch A/B Setup function menu. Ch. A and Ch. B can be set individually.

Page	Key No.	Menu Display	Function
1	F1	Connection Settings	Displays the PMC Connection function menu where you can set connection of power meters. Refer to 9.2.2 "Setting connection to power meters : Connection Settings".
	F2	Channel Settings	Displays the Channel Settings function menu where you can set measurement. Refer to 9.2.3 "Power Meter setting: Channel Settings".
	F4	Zero Sensor	Zeros the levels of power sensors.

Table 9.2.1-1 Ch A/B Setup Function Menu

Zero adjustment: Zero Sensor

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Zero Sensor

Execute the zero adjustment for the power sensor.

Press **F4 Zero Sensor** on the Ch A/B Setup function menu to execute the zero adjustment for the power sensor. Channel A Zero Sensor can be executed when Channel A is **On**, and Channel B Zero Sensor can be executed when Channel B is **On**.

"Executing **%" is displayed during the adjustment, and keys other than the power key are disabled.

Remote command	Execute the zero adjustment
	Command
	:SYSTem:PMETer[1] 2:ZERoset

Details

As for node : PMETer [1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To execute the zero adjustment for the Ch. A power sensor. SYST: PMET: ZER

Example: To execute the zero adjustment for the power sensor.1. Connect the USB terminal of the power sensor to the USB terminal of the MG3710A/MG3710E/MG3740A.		
2. Enter the information of the connected power sensor with Com Port number and Model to the MG3710A/MG3710E/MG3740A.		
3. Turn "On" Channel A or Channel B to be used.		
4. Connect the RF Input terminal of the power sensor to the RF output connector of the MG3710A/MG3710E/MG3740A.		
The power sensor may be damaged depending on the output level of the MG3710A/MG3710E/MG3740A. Beware not to apply excessive input when the terminal is connected.		

5. Perform ZeroSensor.

While the Zero adjustment is in progress, the RF Output of the MG3710A/MG3710E/MG3740A is automatically set to Off.

9.2.2 Setting connection to power meters : Connection Settings

Aux or Top> >> Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Connection Settings

Sets the connection to power meters.

Press **F1 Connection Settings** on the Ch A/B Setup function menu to display the Ch A/B Connection function menu.

Page	Key No.	Menu Display	Function
1	F1	Com Port 2	Sets the COM Port number allocated to the power sensor.
	F2	Model MA24106A	Displays the Model function menu for selection of the model name of the power sensor to be used.
	F3	Open Device Manager	Displays Windows Device Manager. This is used for checking the COM port number of connected power sensor.

Table 9.2.2-1 Ch A/B Connection Function Menu

COM Port setting: COM Port

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Connection Settings>COM Port

Sets the COM Port number of the power sensor.

Press **F1 COM Port** to display the **COM Port** dialog box in the active function frame. Enter numbers and press **F1 Enter** to set the COM Port number.

Setting range	$2 \ {\rm to} \ 8$
Resolution	1
Default	2



Figure 9.2.2-1 COM Port Dialog Box

Remote command

Set the COM Port number

Command

:SYSTem:PMETer[1]|2:COMMunicate:USB:PORT <ext_integer>

Query

:SYSTem:PMETer[1]|2:COMMunicate:USB:PORT?

Response

<ext_integer>

Parameter	
<ext_integer></ext_integer>	COM Port number
Setting range	2 to 8
Resolution	1
Default	2

Details

As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To set the COM Port number of Ch. A to 8. SYST:PMET:COMM:USB:PORT 8 SYST:PMET:COMM:USB:PORT? > 8

Model setting: Model

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Connection Settings>Model

Selects the model name of the power sensor.

Press **F2 Model** to display the Model function menu, and press the function key of the power sensor to be used to set the model.

Page	Key No.	Menu Display	Function
1	F1	MA24104A	600 MHz to 4 GHz
	F2	MA24105A	350 MHz to 4 GHz
	F3	MA24106A	50 MHz to 6 GHz (Default)
	F4	MA24108A	10 MHz to 8 GHz
	F5	MA24118A	10 MHz to 18 GHz
	F6	MA24126A	10 MHz to 26 GHz

Table 9.2.2-2 Sensor Model Function Menu

Notes:

If Windows Device Manager does not display the available USB power sensor, the older version of PowerXpert software may be the cause.

Download and install the latest PowerXpert software from Anritsu website.

Use PowerXpert Ver. 2.11 or later for MA24105A, use PowerXpert Ver. 2.00 or later for other power sensor.

Remote command

Select the model name for the power sensor Command

:SYSTem:PMETer[1]|2:SENSe:MODel MA24104A|MA24105A|MA24106A|MA24108A|MA24118A|MA24126A

Query

:SYSTem:PMETer[1] |2:SENSe:MODel?

Response

<model>

Parameter

<model> Options

Model name of power sensor MA24104A, MA24105A, MA24106A (Default), MA24108A, MA24118A, MA24126A

Details

As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To select the MA24118A for the power sensor. SYST:PMET:SENS:MOD MA24118A SYST:PMET:SENS:MOD? > MA24118A

9.2.3 Power Meter setting: Channel Settings

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Channel Settings

Performs the measurement-related settings.

Press **F2 Channel Settings** on the Ch A/B Setup function menu to display the Ch A/B Settings function menu.

Page	Key No.	Menu Display	Function
1	F1	Channel Freq 1.000000000 GHz	Sets a measurement frequency for the power sensor.
	F2	Channel Offset <u>Off</u> On	Enables/disables adding level offset to the value measured by the power sensor.
	F3	Channel Offset Value 0.00 dB	Sets the offset level value to be added to the power sensor reading.
	F4	Averaging <u>Off</u> On	Enables/disables the averaging for the measurement value with the power sensor.
	F5	Averaging Count Value 1024	Sets the averaging count for the measurement values with the power sensor.
	F6	Measurement Units <u>dBm</u> W	Sets a unit to be used for displaying the value measured by the power sensor.

Table 9.2.3-1 Ch A/B Setup Function Menu

Channel Freq

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Channel Settings>Channel Freq

Sets a measurement frequency for the power sensor.

Press **F1 Channel Freq** on the Ch A/B Settings function menu to display the **Channel Freq** dialog box. Enter the numbers and press the unit key of the Unit function menu to set the offset level value.

Power Sensor	Minimum Value	Maximum Value	Resolution	Default
MA24104A	$600 \mathrm{~MHz}$	4 GHz	1 kHz	1 GHz
MA24105A	$350 \mathrm{~MHz}$	4 GHz	100 kHz	1 GHz
MA24106A	$50 \mathrm{~MHz}$	$6~{ m GHz}$	1 kHz	1 GHz
MA24108A	$10 \mathrm{~MHz}$	$8~{ m GHz}$	100 kHz	1 GHz
MA24118A	$10 \mathrm{~MHz}$	$18~\mathrm{GHz}$	100 kHz	1 GHz
MA24126A	$10 \mathrm{~MHz}$	$26~{ m GHz}$	100 kHz	1 GHz

Table 9.2.3-2 Power Sensor Setting Range

Remote command

Set a measurement frequency for the power sensor Command

:SYSTem:PMETer[1]|2:SENSe:FREQuency[:CW|:FIXed] <freq>

Query

:SYSTem:PMETer[1]|2:SENSe:FREQuency[:CW|:FIXed]?

Response

<freq>

Range

Unit: Hz

Parameter <freq>

Frequency Refer to Table 9.2.3-2 Power Sensor Setting

Range	
Resolution	

Default Suffix code

 MA24104A, MA24106A
 1 kHz

 MA24105A
 100 kHz

 MA24108A, MA24118, MA24126
 100 kHz

 1 GHz
 100 kHz, KHZ, KZ, MHZ, MZ, GHZ, GZ

 When omitted
 Hz

Details

As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To set a measurement frequency of Ch. B to 800 MHz. SYST:PMET2:SENS:FREQ 80000000 SYST:PMET2:SENS:FREQ? > 800 000 000

Level Offset: Channel Offset

		-Auxiliary, >Power Meter>Channel A Setup or Channel Settings>Channel Offset	
	Enables/disables adding level offset to the value measured by the power sensor.		
	Press F2 Channel Offset on the Ch A/B Settings function menu to set it.		
	Off	Does not add level offset (Default).	
	On	Adds level offset.	
Remote command	Enable/disable the l	evel offset for the power sensor	
	Command		
	:SYSTem:PMETer[]	1] 2:SENSe:CORRection:GAIN2:STATe	
	<boolean></boolean>		
	Query :SYSTem:PMETer[1] 2:SENSe:CORRection:GAIN2:STATe?		
	Response		
	<boolean></boolean>	0 or 1	
	Parameter		
	<boolean></boolean>	Level offset On/Off	
	OFF 0	Off (Default)	
	ON 1	On	
	Details		
	As for node : PMETe: follows:	r[1] 2, select Ch. A or B of power meter. Set as	
	Ch.A::PMETer1 o	r :PMETer	
	Ch. B: : PMETer2		

	Programming Example To set a level offset for SYST: PMET2:SENS:CO SYST: PMET2:SENS:CO > 1	the Ch. B power sensor to ON. DRR:GAIN2:STAT ON	
Channel Offset Value	$\operatorname{Period}^{\text{AUX}}$ or Top> \longrightarrow >Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Channel Settings>Channel Offset Value Sets the offset level value to be added to the power sensor reading.		
	Press F3 Channel Offset Value on the Ch A/B Settings function menu to display the Channel Offset Value dialog box. Enter the numbers and press the unit key of the Unit function menu to set the offset level value.		
	Setting range Resolution Default	–100 dB to 100 dB 0.01 dB 0.00 dB	
Remote command	Set an offset level for the power sensor Command :SYSTem:PMETer[1] 2:SENSe:CORRection:GAIN2[:INPut][:MAGN itude] <rel_ampl></rel_ampl>		
	Query :SYSTem:PMETer[1] itude]?	2:SENSe:CORRection:GAIN2[:INPut][:MAGN	
	<pre>Response <rel_ampl></rel_ampl></pre>	Unit: dB	
	<pre>Parameter <rel_ampl> Setting range Resolution Default Suffix code Details As for node : PMETer[3 follows: Ch. A: : PMETer1 or Ch. B: : PMETer2</rel_ampl></pre>	Offset level -100 to +100 dB 0.01 dB 0.00 dB DB, when omitted: DB L] 2, select Ch. A or B of power meter. Set as : PMETer	

		vel for the Ch. B power sensor to -15.00 dB. NS:CORR:GAIN2 -15.00
Averaging	Channel B Setup,	>Auxiliary, >Power Meter>Channel A Setup or >Channel Settings>Averaging the averaging for the measurement value with the
	Press F4 Averagin	ig on the Ch A/B Settings function menu to set it.
	Off On	Does not perform averaging. (Default) Performs averaging.
Remote command	<pre>Enable/disable averaging Command :SYSTem:PMETer[1] 2:SENSe:AVERage[:STATe] <boolean> Query :SYSTem:PMETer[1] 2:SENSe:AVERage[:STATe]?</boolean></pre>	
	Response <boolean></boolean>	0 or 1
	follows: Ch.A::PMETer1 Ch.B::PMETer2 Programming Exa	ample or meter averaging to ON. IS:AVER ON

Averaging Count Value

Auxiliary, >Power Meter>Channel A Setup or Channel B Setup, >Channel Settings>Averaging Count Value

Sets the averaging count for the measurement values with the power sensor.

Press **F5 Averaging Count Value** on the Ch A/B Settings function menu to display the **Averaging Count Value** dialog box. Enter the numbers and press **F1 Enter** to set the averaging count.

Setting range	$1 \mbox{ to } 2048$
Resolution	1
Default	1024

Remote command Set the averaging count

Command

:SYSTem:PMETer[1]|2:SENSe:AVERage:COUNt <ext integer>

Query

:SYSTem:PMETer[1] |2:SENSe:AVERage:COUNt?

Response

<ext_integer>

Parameter

The number of measurement points
1 to 2048
1
1024

Details

As for node : PMETer[1] | 2, select Ch. A or B of power meter. Set as follows:

Ch.A::PMETer1 or :PMETer Ch.B::PMETer2

Programming Example

To set Ch. B power meter averaging to 1024 times. SYST:PMET2:SENS:AVER:COUN 1024 SYST:PMET2:SENS:AVER:COUN? > 1024

Measurement Units

	Channel B Setup, >Ch Sets a unit to be used a sensor.	uxiliary, >Power Meter>Channel A Setup or nannel Settings>Measurements Units for displaying the value measured by the power	
	Press F6 Measuremen set it.	t Units on the Ch A/B Settings function menu to	
	dBm W	Displays in dBm (Default). Displays in W.	
Remote command	Set the output level un Command :SYSTem:PMETer[1]	nit 2:UNIT:POWer DBM W	
	Query :SYSTem:PMETer[1]	2:UNIT:POWer?	
	Response <unit></unit>		
	Parameter		
	<unit></unit>	Output level unit	
	DBM	dBm	
	W	W	
	Details As for node : PMETer[1] 2, select Ch. A or B of power meter. Set as follows:		
	For Ch. A: : PMETer1 For Ch. B: : PMETer2	For Ch. A: : PMETer1 or : PMETer For Ch. B: : PMETer2	
	Programming Exampl To set a unit to be used meter to dBm. SYST:PMET2:UNIT:PO SYST:PMET2:UNIT:PO > DBM	d for displaying the output level of the Ch. B power	

9.3 Alarm History

AUX or Top> > Auxiliary, > Alarm History

The MG3710A/MG3710E/MG3740A can store occurred alarm histories up to 100 in files.

Press **F4 Alarm History** on the Auxiliary function menu to display the **Alarm History** dialog box and the Alarm History function menu.

	Date	[7]RSVD	[6]RSVD	[5]RSVD	[4]RPP	[3]BB	[2]ALC	[1]RSVD	[0]REF
1	2011/11/22 19:45:56	ОК	ок	ок	ок	NG	ОК	ОК	ок
2	2011/11/22 19:47:57	ок	ок	ок	ок	NG	ОК	ОК	NG
З	2011/11/22 19:53:38	ок	ок	ок	ок	NG	ОК	ОК	ок
4	2011/11/22 19:55:24	ок	ОК	ок	ок	NG	ОК	ОК	NG
5	2011/12/22 10:32:27	ок	ОК	ок	ок	NG	ОК	ОК	ок
6	2011/12/22 10:34:37	ок	ОК	ок	ок	NG	ок	ок	NG

Figure 9.3-1 Alarm History Dialog Box

Display	Description
Date	Alarm occurrence date, time
[7]RSVD	Not used
[6]RSVD	Not used
[5]RSVD	Not used
[4]RPP	RPP Alarm
[3]BB	Baseband Reference Clock PLL Alarm
[2]ALC	ALC Alarm
[1]RSVD	Not used
[0]REF	Reference Oscillator PLL Alarm
OK	Normal
NG	Alarm occurred.

Table 9.3-1 Alarm History Display

For measures for Alarm, refer to 11.6 "Troubleshooting".

Table 9.3-2 Alarm History Function Mer	u
--	---

Page	Key No.	Menu Display	Function
1	F8	Save	Displays the Save Alarm History function menu where you can set alarm histories to save.
			Refer to 9.3.1 "Saving Alarm History: Save".

9.3.1 Saving Alarm History: Save

	When an error occurs of MG3710A/MG3710E/M	uxiliary, >Alarm History>Save: during operation of the MG3740A, an alarm is displayed, describing details. larm History. Using this function, you can save
Remote command	Save Alarm History in Command	an alarm file
		Re:ALARm:LOG [<string>[,<device>]]</device></string>
	Parameter	
	<string></string>	File name excluding extension Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ') (excluding extension)
		The following characters cannot be used: $(/ : * ? " / < >)$
		Automatically named as "Alarm_[Date]_[Additional number].log" when omitted.
		The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
	<device> Options</device>	Number of the drive A to Z, currently selected drive when omitted

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\Alarm History\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To name an alarm file as "TEST" and saves it in D drive. MMEM:STOR:ALAR:LOG "TEST",D

Operation method Example: To name the currently displayed file as "Alarm20110624_000" and save it.

 Press F8 Save on the Alarm History function menu to display the Alarm Save dialog box on the active function menu, the File List dialog box in the function display frame, and the Alarm Save function menu in the function menu frame.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu and sets the destination Drive.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F7	Save	Saves the file to the Drive selected with F1 Drive .
	F8	Cancel	Returns to the previous menu.

 Table 9.3.1-1
 Alarm Save Function Menu

2. Press **F1 Drive** to select the destination Drive.

Options All connected Drives Default C

3. The **File List** dialog box of the device selected in Step 2 is displayed, and the files are displayed.

NOPQRSTUVWXYZ,.@ hopqrstuvwxyz;'~ &&()+-=_[]^{}}

Figure 9.3.1-1 Alarm Save Dialog Box

- Enter the file name to the text box in the active function frame. By default, the "Alarm[Date]_Additional number" is displayed in the text box.
- 5. Enter "Alarm20110624_0000" in the text box and press **F7 Save**. The file with the entered file name is saved, and the **Alarm Save** dialog box closes.

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Destination path: Anritsu\MG3710A\User Data¥Alarm History\
- Default destination name: Alarm[Date]_[Additional number].log The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
- Characters available for file names are displayed on the character pallet.
- The following characters cannot be used:
 / : * ? " " ' ' < > |
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

9.4 Utility Function

$(Utility) or Top > \rightarrow > Utility$

When you press the **Utility** of the main function key, the MG3710A/MG3710E/MG3740A becomes the utility setting mode and displays the Utility function menu. On this menu, you can save or call parameters or set networks and other functions.

This section assumes that the MG3710A/MG3710E/MG3740A is in the utility setting mode, unless otherwise explained.

Page	Key No.	Menu Display	Function
1	F1	Interface Settings	Sets the interface for remote control. Refer to 9.4.1 "Interface Settings".
	F2	System Settings	Performs common settings in the system. Refer to 9.4.2 "System Setting".
	F3	Instrument Info	Displays the status and factory shipment defaults of the MG3710A/MG3710E/MG3740A. Refer to 9.4.3. "Instrument Info".
	F4	Install	Adds or deletes firmware, waveform licenses, and options. Refer to 9.4.4 "Install".
	F5	Error Info	Displays the error information. Refer to 9.4.5 "Displaying Error Information: Error Info".

Table 9.4-1 Utility Function Menu

9.4.1 **Interface Settings**

(∪tility) or Top>→>Utility, >Interface Settings

The MG3710A/MG3710E/MG3740A allows the remote control with GPIB, Ethernet, and USB. Press F1 Interface Settings on the Utility function menu to display the Interface Settings function menu. Set the interface for remote control.

For details, refer to Appendix E "Remote Control".

Table 9.4.1-1	Interface Setting Function Menu
---------------	---------------------------------

Page	Key No.	Menu Display	Function
1	1 F1 GPIB 3		Sets GPIB Address.
	F2	Terminator <u>CR</u> LF EOI	Sets a terminator (end code) for a response message of controller sending, which is sent by a measuring instrument via remote control.
	F3	Language SCPI	Selects a language mode during remote control.
	F4	Raw Socket Port Number 49158	Specifies a TCP/IP port number for transmitting the waveform data from IQproducer, which locates on an external PC, to the MG3710A/MG3710E/MG3740A.

GPIB address: **GPIB**

Utility) or Top> > Utility, > Interface Settings> GPIB

Sets GPIB Address.

Press F1 GPIB on the Interface Settings function menu to display the GPIB dialog box on the active function frame. Enter numbers and press Enter to set it.

Setting range	$1 \mbox{ to } 30$
Default	3
Resolution	1

Remote command

Set GPIB Address

Command

:SYSTem:COMMunicate:GPIB:ADDRess <ext integer>

Query

:SYSTem:COMMunicate:GPIB:ADDRess?

Response

<ext_integer>

Parameter

<ext_integer></ext_integer>	$\ GPIB \ address$
Setting range	1 to 30
Default	3
Resolution	1

Programming Example

To set GPIB Address to 2. SYST:COMM:GPIB:ADDR 2 SYST:COMM:GPIB:ADDR? > 2

Terminator

Utility or Top>	>>Utility, >Interface Settings>Terminator				
Sets a terminate	Sets a terminator (end code) for a response message of controller sending,				
which is sent by	a measuring instrument via remote control.				
Press F2 Termin terminator.	nator on the Interface Settings function menu to select a				
\mathbf{CR}	Adds CR+LF to transmit EOI (Default).				
\mathbf{LF}	Adds LF to transmit EOI.				
EOI	Transmits EOI without adding any characters.				

Remote command

Set a terminator (end code)

Command

:SYSTem:COMMunicate:GPIB:TERMinator LF|CRLF|EOI

Query

:SYSTem:COMMunicate:GPIB:TERMinator?

Response

<terminator>

Parameter

<terminator></terminator>	Terminator
CRLF	Adds CR+LF to transmit EOI (Default).
LF	Adds LF to transmit EOI.
EOI	Transmits EOI without adding any characters.

Programming Example

To set a terminator to CRLF. SYST:COMM:GPIB:TERM CRLF SYST:COMM:GPIB:TERM? > CRLF

Selecting control language: Language

 \bigcirc or Top> \rightarrow >Utility, >Interface Settings>Language Selects a language mode during remote control.

Press **F3 Language** on the Interface Settings function menu to select an assignment from options displayed on the function menu.

SCPI	Sets a language mode to SCPI mode (Default).
MG3700A	Sets a language mode to the MG3700 mode.
MS269xA	Sets a language mode to the MS269x mode.
MS2830A	Sets a language mode to the MS2830 mode.
MG364x	Sets a language mode to the MG364x mode.

Remote command

Set a language mode

Command

:SYSTem:LANGuage SCPI | MG3700 | MS269X | MS2830 | MG364X

Query

:SYSTem:LANGuage?

Response

<language>

Parameter

<language></language>	Language mode
SCPI	Sets to the SCPI mode (Default).
MG3700	Sets to the MG3700 mode (Native).
MS269X	Sets to the MS269x mode (Native).
MS2830	Sets to the MS2830 mode (Native).
MG364X	Sets to the $MG364x$ mode (Native).

Programming Example

To set a language mode to the MS2830 mode. SYST:LANG MS2830A SYST:LANG? > MS2830A

TCP/IP port number: Raw Socket Port Number

Or Top>→>Utility, >Interface Settings>Raw Socket Port Number

Specifies a TCP/IP port number for transmitting the waveform data from IQproducer, which locates on an external PC, to the MG3710A/MG3710E/MG3740A.

Press **F4 Raw Socket Port Number** on the Interface Settings function menu to display the **Raw Socket Port Number** dialog box in the active function frame. Enter numbers and press **Enter** to set it.

Setting range	49152 to 65535
Default	49158
Resolution	1

9.4.2 System Settings

Utility or Top>→>Utility, >System Settings

Press **F2 System Settings** on the Utility function menu to display the System Setting function menu. Set common items in the system.

Page	Key No.	Menu Display	Function
1	F1	Beep Sound <u>Off</u> On	Specifies On to make a beep or Off not to make it when displaying an error message.
	F3	Power On <u>Preset</u> Last	Specifies status of parameters when the power is on.

Table 9.4.2-1	System	Settings	Function	Menu
---------------	--------	----------	----------	------

Beep

Utility or Top> > Utility, > System Settings> Beep Sound

Enables/disables a beep when displaying an error message.

Press **F1 Beep Sound** on the System Setting function menu to enable/disable a beep.

On	Enables a beep (Default).
Off	Disables a beep.

Remote command

Enable/disable a beep Command

:SYSTem:BEEPer <boolean>

Query

:SYSTem:BEEPer?

Response

<boolean>

0 or 1

Parameter

<boolean> ON|1 Off|0 Beep Enables a beep (Default). Disables a beep.

Programming Example

To disable a beep. SYST:BEEP OFF SYST:BEEP? > 0

Parameters at power-on: Power On

 \bigcirc or Top> \bigcirc >Utility, >System Setting>Power On Specifies status of parameters when the power is on.

Press F3 Power On of the System Setting function menu to set the status.

La

Last	Keeps the status when the power is on and
	recovers them if the power goes on (Default).
Preset	Does not keep the status when the power is on
	and uses default values if the power goes on.
	Pressing Preset performs the same
	operation as initializing by pressing F1 Preset .

Remote command Specify status of parameters when the power is on Command

:SYSTem:PON:TYPE PRESet|LAST

Query

:SYSTem:PON:TYPE?

Response

<type>

PRES or LAST

Parameter

<type> LAST

PRESet

Status of parameters Keeps the status when the power is off and recovers them if the power goes on (Default). Does not keep the status when the power is off and uses default values if the power goes on. Pressing Preset performs the same operation as initializing by pressing F1 Preset.

Programming Example

To set status of parameters when the power is on to the default values. SYST: PON: TYPE PRES SYST: PON: TYPE? > PRES

9.4.3 Instrument Info

Utility or Top>>>Utility, >Instrument Info

Press **F3 Instrument Info** on the Utility function menu to display the Instrument Info function menu. This function displays the status and factory shipment defaults of the system.

Page	Key No.	Menu Display	Function
1	F1	Product Info	Displays the Product Information dialog box where you can see the product information.
	F2	Instrument Options	Displays the Instrument Options dialog box where you can see the option information.
	F3	Board Info	Displays the Board Information dialog box where you can see the revision number of the board.
	F4	FPGA Info	Displays the FPGA Info dialog box where you can see the FPGA version.
	F5	Waveform Licenses	Displays the Waveform Licenses dialog box where you can see the license number of the waveform data.

Table 9.4.3-1	Instrument Info	Function Menu
	mati ument into	

Product Info

or **Top**> \rightarrow >**Utility**, >**Instrument Info**>**Product Info**Displays the product information.

Press **F1 Product Info** on the Instrument Info function menu to display the **Product Information** dialog box.

Product Name	Product name
Product Model	Product model name
Serial Number	Serial number of the system (hardware)
Firmware Version	Version of this application
USB Product ID	Product ID of the USB port for remote
	control
USB Vendor ID	Vendor ID of the USB port for remote
	control
USB Serial Number	Serial number of the USB port for remote
	control
Power On (Hours:Minutes	Seconds)
	Elapsed time since the power is turned to on
SG1 Frequency Setting Ra	nge
	SG1 Frequency Setting Range
SG1 Level Setting Range	SG1 Level Setting Range
SG1 ARB Memory Size	SG1 Waveform Memory Size (MSamples)
SG1 AWGN	SG AWGN function On/Off

SG1 RPP Count	Number of circuit breaker trips by SG1 RPP		
SG2 Frequency Setting Ra	inge		
	SG2 Frequency Setting Range		
SG2 Level Setting Range	SG2 Level Setting Range		
SG2 ARB Memory Size	SG2 Waveform Memory Size (MSamples)		
SG2 AWGN	SG2 AWGN function On/Off		
SG2 RPP Count	Number of circuit breaker trips by SG2 RPP $$		
Note:			
RPP Count is display	RPP Count is displayed when the reverse input power protection		

option (Opt-043/143/073/173) is installed.

Remote commands for displaying the product information are as follows:

Remote command Device information

Query Product Type (product model name), Serial Number (serial number), Firmware Version (version of this application), or the information common to IEEE488.2

Query

*IDN?

Response

company,model,serialnumber,firmware

Parameter

company	Manufacturer (ANRITSU)
model	Product model name (7 alphanumeric
	characters)
serialnumber	Serial number specific to the product (10-digit
	numbers)
firmware	Version number of this application
	11

Programming Example

To query the device information.

*IDN?

> ANRITSU,MG3710A,610000000,1.00.00.

Remote command	Query the Product Type (product model name) Query :SYSTem:INFormation:MODel? Response <model></model>	
	Parameter	
	<model></model>	Product model name
	Programming Exa	mple
	To query the produce SYST: INF: MOD?	act model name.
	> MG3710A	
Remote command	Query Product Name (product name) Query	
	:SYSTem:INForma	ation:TYPE?
	Response	
	<type></type>	
	Parameter	
	<type></type>	Product name
	Programming Exa	mple
	To query the product name.	
	SYST:INF:TYPE? > SIGNAL GENERATOR	
Remote command	Query Serial Numl Query	ber (serial number)
	:SYSTem:INForma	ation:SERial?
	Response	
	<serial></serial>	
	Parameter	
	<serial></serial>	Serial number
	Programming Exa	mple
	To query the serial	number.
	SYST:INF:SER? > 6100000000	
	> 010000000	

Remote command	Query Running Time (available time) Query :SYSTem:INFormation:RTIMe?		
	Response <time> Parameter <time> Bunning time</time></time>		
	Suffix code	Running time None, Unit: m (minutes)	
	Programming Ex To query the runn SYST:INF:RTIM [*] > 100	ning time.	
Remote command	Query Firmware Version (the version of this application) Refer to the explanation of "*IDN?".		
Instrument Options			
	Utility or Top> \rightarrow >Utility, >Instrument Info>Instrument OptionsDisplays the option information of the system.		
	Press F2 Instrument Options on the Instrument Info function menu to display the Instrument Options dialog box in the function display frame.		
	Number Name State	Number of the installed hardware option Name of the hardware option Status of On/Off switch	
Remote command	<pre>Query the option information Query :SYSTem:HARDware:OPTion:CATalog? Response <total>,<number1>,<switch1>,<name1>,<number2>,<switch2>, <name2> Parameter</name2></switch2></number2></name1></switch1></number1></total></pre>		
	<total> <number></number></total>	Total number of selectable options Number of the option	
	<switch></switch>	Status of the option (On or Off) ON, OFF	
	<name></name>	Name of the option	

Programming Example

To query the option information. SYST:HARD:OPT:CAT? > 1,001,ON,Rubidium Reference Oscillator

Board Info

Utility or Top>>>Utility, >Instrument Info>Board Info

Displays Revision of the system board.

Press **F3 Board Info** on the Instrument Info function menu to display the **Board Information** dialog box in the function display frame.

	Board Information				
ID	Board Name	Revision	Ext. ID	Ext. Board Name	Ext. Revision
10	VSG1	2	N/A	ANALOG_IQ	0
10	VSG1	2	5	SG_RF	2
10 10	VSG1	2	5	SG_BB	2
10	VSG1	2			

ID ID number of the board Board Name Name of the board Revision Revisions Ext.ID ID number of the expansion board Ext. Board Name Name of the expansion board Ext. Revision Revisions of the expansion board **Remote command** Query the revision number of the specified hardware Querv :SYSTem:HARDware:REVision? <hardware> Response <revision> Parameter <hardware> Hardware type MAIN Main Board (With BER option) MAIN NO BER Main Board (Without BER option) VSG1 1st VSG Board VSG2 2nd VSG Board MAIN IB Interface Board (With BER option) MAIN NO BER IB Interface Board (Without BER option) VSG1 ANALOG IQ 1st VSG Analog I/Q Board VSG1 SG BB 1st VSG Baseband Board VSG1 SG RF 1st VSG RF Board VSG2 ANALOG IQ 2nd VSG Analog I/Q Board VSG2 SG BB 2nd VSG Baseband Board VSG2 SG RF 2nd VSG RF Board

Figure 9.4.3-1 Board Information (VSG1 Revision=2)

<revision>

Revision number

Details

This command queries the revision number of the specified hardware. "-" is returned when reading a version number of hardware not installed. To query in batch all hardware names and revision numbers, use: :SYSTem:HARDware:REVision:CATalog?

Programming Example

To query the revision number of Main Board. SYST:HARD:REV? MAIN > 2

Remote command

Query revision numbers of all the hardware Query :SYSTem:HARDware:REVision:CATalog?

Response

<hardware1>, <revision1>, <hardware2>, <revision2>, ...

Parameter

<hardware></hardware>	Hardware type
MAIN	Main Board (With BER option)
MAIN_NO_BER	Main Board (Without BER option)
VSG1	1st VSG Board
VSG2	2nd VSG Board
MAIN_IB	Interface Board (With BER option)
MAIN_NO_BER_IB	Interface Board (Without BER option)
VSG1_ANALOG_IQ	1st VSG Analog I/Q Board
VSG1_SG_BB	1st VSG Baseband Board
VSG1_SG_RF	1st VSG RF Board
VSG2_ANALOG_IQ	2nd VSG Analog I/Q Board
VSG2_SG_BB	2nd VSG Baseband Board
VSG2_SG_RF	2nd VSG RF Board
<revision></revision>	Revision number

Details

This command queries revision numbers of all the hardware. No response is returned when the hardware does not exist.

Programming Example

To query all revision numbers. SYST:HARD:REV:CAT? > MAIN,2,VSG1,4,VSG_SG_RF,0,VSG1_SG BB,1

FPGA Info

\bigcirc or Top> \bigcirc >Utility, >Instrument Info>FPGA Info Displays FPGA Version of the system.

Displays FPGA version of the system.

Press **F4 FPGA Info** on the Instrument Info function menu to display the **FPGA Info** dialog box in the function display frame.

NameFPGA nameBoardInstalled FPGA board nameVersionVersions

Remote command

Query the version number of FPGA Query

:SYSTem:FPGA:VERSion? <hardware>

Response

<version>

Parameter

<hardware></hardware>	FPGA type
CNTR_KEY	ControlPldAndPanel
HWC	HardwareControlFpga
MEAS_COM	MeasureComDsp
MEAS_CORE	MeasureCoreFpga
MEAS_PCI	MeasurePciFpga
SGBB	${f SgBbHardwareControlFpga}$
SGCTRL	SgControlFpga
SGRF	SgRfFpga
<version></version>	Version number of FPGA

Details

This command queries the version number of the specified FPGA. "-" is returned when reading a version number of hardware not installed. To acquire in batch the version numbers of all the FPGAs, use: :SYSTem:FPGA:VERSion:CATalog?

Programming Example

To query the version number of HWC FPGA. SYST:FPGA:VERS? CNTR_KEY > 5

9.4 Utility Function

Remote command

Query the version numbers of all FPGAs

Query

:SYSTem:FPGA:VERSion:CATalog?

Response

<hardware1>, <version1>, <hardware2>, <version2>...

Parameter

<hardware></hardware>
ControlPldAndPanel
HardwareControlFpga
MeasureComDsp
MeasureCoreFpga
MeasurePciFpga
SgBbHardwareControlFpga
SgControlFpga
SgRfFpga
<version></version>

FPGA type ControlPldAndPanel HardwareControlFpga MeasureCoreFpga MeasurePciFpga SgBbHardwareControlFpga SgControlFpga SgRfFpga Version number of FPGA

Details

This command queries the version number of all FPGAs. No response is returned when the hardware does not exist.

Programming Example

To query the version number of all FPGAs. SYST:FPGA:VERS:CAT?

> HardwareControlFpga,6,MeasurePciFpga,15, MeasureComDsp,46,MeasureCoreFpga,21,SgBbHardwareContro lFpga,3,SgRfFpga,5,SgControlFpga,7,ControlPldAndPanel, 5

Waveform Licenses

utility, >Instrument Info>Waveform LicensesDisplays waveform licenses.

Press **F5 Waveform Licenses** on the Instrument Info function menu to display the **Waveform Licenses** dialog box and the Waveform Licenses function menu.

License Name	Names of waveform licenses
Serial Number	Serial number
Version Limit	Versions are limited. Only the files with the
	displayed version number or earlier can be
	worked with.
Note	Remarks

Table 9.4.3-2 Waveform Licenses Function Menu

Page	Key No.	Menu Display	Function
1	F1	Install	Displays the Waveform Licenses function menu and the Waveform License Install dialog box.
	F2	Uninstall	Selects a waveform license in the Waveform Licenses dialog box and deletes it.

Remote commands for Waveform license information are as follows:

Remote command Query the total number of waveform licenses Query :SYSTem:WAVeform:LICense:COUNt? Response <integer> Total number of waveform licenses **Programming Example** To query the total number of waveform licenses. SYST:WAV:LIC:COUN? > 3 **Remote command** Query a license name of waveform license specified with a number Query :SYSTem:WAVeform:LICense:NAME? <integer> Response <string>

	Parameter		
	<integer></integer>	Number	
	Setting range	0 to (license count -1)	
	Resolution	1	
	<string></string>	License name of the waveform license	
		Character string within 100 characters enclosed	
		by double quotes (" ") or single quotes (' ')	
		(excluding extension)	
	Programming Exar	nple	
	To query the license	e name of waveform license with #5.	
	SYST:WAV:LIC:NA	ME? 5	
	> "W-CDMA Wavef	form"	
Remote command	-	Imber of waveform license specified with a number	
Query :SYSTem:WAVeform:LICense:VERSion? <integer></integer>			
	:SYSTem:WAVefor	m:LICense:VERSion? <integer></integer>	
	Response		
	<numeric></numeric>		
	Parameter		
	<integer></integer>	No.	
	Setting range	0 to (license count -1)	
	Resolution	1	
	<numeric></numeric>	Version number	
	Programming Exar	nple	
		number of waveform license with #5.	
	SYST:WAV:LIC:VE	RS? 5	
	> 1.23		
Remote command	Doloto the wayofor	m license specified with a name	
Remote command	Command	ni ncense specined with a name	
	Command :SYSTem:WAVeform:LICense:DELete <string></string>		
	.SISTEM.WAVELUL	M. LICENSE. DELECE (String)	
	Parameter		
	<string></string>	Name of waveform license	
		Character string within 100 characters enclosed	
		by double quotes ("") or single quotes ('")	
		(excluding file extension)	
	Programming Exar	nple	
		DMA License" waveform license.	
		L "W-CDMA License"	
	To delete the "W-Cl	DMA License" waveform license.	

Remote command	Install a waveform lic Command	ense by specifying a license file	
	:SYSTem:WAVeform:	:LICense:INSTall <string>[,<device>]</device></string>	
	Parameter		
	<string></string>	Name of a license file	
		Character string within 100 characters enclosed	
		by double quotes (" ") or single quotes (' ') (excluding extension)	
	<device></device>	Drive number: A to Z, currently selected drive	
		when omitted	
	Programming Examp	le	
	To install the license file "LicenseFile" in D drive.		
	SYST:WAV:LIC:INST	f "LicenseFile",D	
Operation method	Install or uninstall wave	eform licenses	
	Example: To install a w	vaveform license.	
		on the Waveform Licenses function menu to display cense Install dialog box and the Waveform License	
	File Name	File name	
	License Name	Name of waveform license	
	State	Not used	
	Serial Number	Serial number	
	Version Limit	Versions are limited. Only the files with the	
		displayed version number or earlier can be worked with.	

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu where you can select a drive containing waveform licenses.
	$\mathbf{F7}$	Install	Installs selected waveform license files.

 $2. \quad {\rm Press} \ {\bf F1} \ {\bf Drive} \ {\rm to} \ {\rm select} \ {\rm a} \ {\rm drive} \ {\rm for} \ {\rm containing} \ {\rm waveform} \ {\rm licenses}.$

Options All connected drives

- Default C
- 3. The **File List** dialog box for the device selected in Step 2 appears and shows files.

 Select a waveform license to be installed in the Waveform License Install dialog box, press F7 Install, and the Confirmation function menu is displayed.

Page	Key No.	Menu Display	Function
1	F7	Confirm installation	Performs installation.
	F8	Cancel	Returns to the menu before this menu is opened.

Table 5.4.3-4 Communation Function Menu	Table 9.4.3-4	Confirmation	Function	Menu
---	---------------	--------------	-----------------	------

5. Press F7 Confirm installation.

Example: Uninstalling Waveform License

1. Select the way	veform license to be uninstalled at the Waveform
License dialog	g box.
License Name	Names of waveform licenses
Serial Number	Serial number
Version Limit	Versions are limited. Only the files with the
	displayed version number or earlier can be worked
	with.
Note	Remarks

2. Press **F2 Uninstall** at the Waveform Licenses function menu to display the **Waveform License** dialog box and Confirmation function menu.

Table 9.4.3-5	Confirmation	Function Menu
---------------	--------------	----------------------

Page	Key No.	Menu Display	Function
1	F7	Confirm Uninstallation	Performs Uninstallation.
	F8	Cancel	Returns to the menu before this menu is opened.

3. Press **F7** Confirm installation.

9.4.4 Install

Utility or Top> > Utility, >Install

Updates the firmware and adds or deletes waveform licenses.

Press **F4 Install** on the Utility function menu to display the Install function menu.

Page	Key No.	Menu Display	Function
1	F1	Firmware	Updates the firmware.
	F2	Waveform Licenses	Displays the Waveform Licenses dialog box where you can add or delete waveform licenses.
	F3	Options	Adds options.
	F8	Factory Preset	Initializes parameters to the level at which past status does not affect operations at all.

Table 9.4.4-1 Install Function Menu

Updating firmware: Firmware

Utility) or Top>>>>Utility, >Install>Firmware

Updates the firmware.

Note:

After installing the firmware, the auto-saved parameter file at power off "LastParameterSetting.xml" will be deleted. After power on, the setting returns to the default setting.

Example: To install a firmware file.

- Copy the installer file "Setup.msi" and "update.bat" to a root folder on any drives or to the following folder: [Drive] \Anritsu\MG3710A\User Data\Install
- 2. Press **F1 Firmware** on the Install function menu to display the Firmware Install function menu and the **Installer Lis**t dialog box.

Table 9.4.4-2 Firmware Install Function Menu

Page	Key No.	Menu Display	Function
1	$\mathbf{F7}$	Install	Displays the Confirmation function menu.

- 3. Make sure the **Installer List** dialog box shows the information about the installer file "Setup.msi".
- 4. Select a file to install and press **F7 Install** to display the Confirmation function menu.

Page	Key No.	Menu Display	Function
1	$\mathbf{F7}$	Confirm installation	Performs installation.
	F8	Cancel	Returns to the previous menu.

 Table 9.4.4-3
 Confirmation Function Menu

5. Press F7 Confirm installation.

6. Install is performed after quitting the application and uninstalling. Then a restart is performed; this all occurs automatically.

Note:

When installing the firmware, "Now Processing" displays.

Boot Lo	ader Service
	Now processing.

Adding/deleting waveform licenses: Waveform Licenses

 \bigcirc or Top> \bigcirc >Utility, >Install>Waveform Licenses Adds or deletes waveform licenses.

Press **F2 Waveform Licenses** on the Install function menu to display the Waveform Licenses function menu and the **Waveform Licenses** dialog box.

Refer to Table 9.4.3-2 "Waveform Licenses Function Menu" for how to add or delete waveform licenses.

Adding options: Options

\bigcirc or Top> \rightarrow >Utility, >Install>Options Adds options.

Press **F3 Options** on the Install function menu to display the **Option Install** dialog box and the Option Install function menu.

Number	Number of the option
Name	Name of the option
State	Indicates On/Off of the option.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu where you can select a drive containing options.
	F7	Install	Displays the Confirmation function menu.

Table 9.4.4-4 Option Install Function Menu

Example: To install an option.

- 1. Press **F1 Drive** on the Option Install function menu to select a drive containing options.
 - Options All connected drives
 - Default C

installation

Cancel

F8

2. Select options to install in the **Option Install** dialog box and press **F7 Install**. The Confirmation function menu is displayed.

Table 3.4.45 Commutation Function Menu					
Page	Key No.	Menu Display	Function		
1	F7	Confirm	Performs installation.		

Table 9.4.4-5 Confirmation Function Menu

3. Press **F7 Confirm installation** to perform installation.

Returns to the previous menu.

Factory Preset

Utility or Top>>>>Utility, >Install>Factory Preset

Factory Preset is initialization with the largest target range available with normal panel operations and remote control commands. It initializes parameters to the level at which past status before the initialization does not affect operations at all.

Any folders excluding Waveform in the UserData folder created by the MG3710A/MG3710E/MG3740A are deleted, and a reboot is executed after the following processings are executed.

- I/Q Calibration Restore Default Setting
- Preset Reference Clock, Correction Table Clear
- Channel Table Clear
- List Table Clear

• The following folders are deleted: Anritsu\MG3710A\User Data\Corrections\ Anritsu\MG3710A\User Data\Copy Files\ Anritsu\MG3710A\User Data\Parameter Setting\ Anritsu\MG3710A\User Data\ChannelTable\ Anritsu\MG3710A\User Data\ListTable\ Anritsu\MG3710A\User Data\Alarm History\ Anritsu\MG3710A\User Data\BERT BitPattern\ Anritsu\MG3710A\User Data\BERT Log\

Press **F8 Factory Preset** to display the Factory Preset function menu and **Factory Preset** message.

Factory Preset

This will reset all settings in the instrument to the factory defaults and restart. This includes the user data (C:¥Anritsu¥MG3710A¥User Data), but not the waveform data (C:¥Anritsu¥MG3710A¥User Data¥Waveform). I/Q Calibration data will also be reset to the factory defaults.

Figure 9.4.4-1 Factory Preset Message

Table 9.4.4-6	Factory Preset Function Mer	าน
---------------	-----------------------------	----

Page	Key No.	Menu Display	Function
1	F7	Confirm Reset To Factory Default	Performs System Preset and initialize parameters to the level at which past status does not affect operations at all.
	F8	Cancel	Returns the menu before this menu is opened.

SYST:FPR

9-48

9.4.5 Displaying Error Information: Error Info

Utility or Top>>>>Utility, >Error Info

Displays the error information.

Refer to Appendix B "Error Messages".

Note:

The **Error Queue** dialog box displays the most recent 30 screen operation errors.

Press **F5 Error Info** on the Utility function menu to display the Error Info function menu and **Error Queue** dialog box.

Er	Error Queue					
ID	Error	Description				
-310	System Error	Failed to load list file.				
-222 -222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222 -222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				
-222	Data out of range	Setting value out of range				

Figure 9.4.5-1 Error Queue Dialog Box

ID	Shows error code.
Error	Displays error message.
Description Describes error content	
Note:	
Error information caused by remote control can be read using the	
following remote commands. The most recent 30 errors are saved	

To read remote control error code and error message Query

:SYSTem:ERRor[:NEXT]?

Response

<code>

Remote command

Error code number 0, "No Error" returns where there is no error.

Programming Example

SYST:ERR?
> 0,"No error"

Remote command	To read remote control error code				
	Query				
	:SYSTem:ERRor:CODE[:NEXT]?				
	Response				
	<code></code>	Error code number			
		"0" returns where there is no error.			
	Programming Example				
	SYST:ERR:CODE?				
	> 0				
Remote command	Select the mode	to display error messages when an error occurs			
	during remote control				
	Command				
	:DISPlay:ERRor:MODE NORMal REMain LAST				
	Query				
	:DISPlay:ERRor:MODE?				
	Response				
	<mode></mode>	NORM, REM or LAST			
	Parameter				
	<mode></mode>	Display mode for error messages			
	NORMal	Clears the error message when the next			
		command is received (Default).			
	REMain	Keeps the first error message displayed.			
	LAST	Keeps the last error message displayed.			
	Details				
	This is a function only with a remote command.				
	The setting of th	e mode to display error messages is not included in the			
	initialization by 9.5.1 "Preset". The setting with this command can be				
	initialized with Factory Preset in 9.4.4 "Install".				

Programming Example

To keep the first error message displayed. DISP:ERR:MODE REM DISP:ERR:MODE? > REM

Page	Key No.	Menu Display	Function
1	F7	Clear	Deletes error information.

 Table 9.4.5-1
 Error Info Function Menu

Deleting Error Information: Clear

Or Top>→>Utility, >Error Info>Clear

Deletes the error information.

9.4.6 Changing Boot Loader Service

The Boot Loader Service program runs immediately after the MG3710A/MG3710E/MG3740A is powered-up to read and boot from the MG3710A/MG3710E/MG3740A firmware. This section explains the procedure for changing the Boot Loader Service program.

The procedure is performed in the following sequence: Disabling Boot Loader Service Start (Boot) Installing Boot Loader Service

Disabling Boot Loader Service Start (Boot)

- 1. Power-up the MG3710A/MG3710E/MG3740A.
- Click the Windows Start button and select All Programs > Startup > Shortcut to Boot Loader Service, and then right-click to display the context menu.
- 3. Select **Delete** so that Boot Loader Service does not run automatically immediately after Windows starts.
- 4. Power-down the MG3710A/MG3710E/MG3740A.
- 5. Power-up the MG3710A/MG3710E/MG3740A.

Note:

Subsequently, neither the Boot loader Service program nor the MG3710A/MG3710E/MG3740A applications will start when Windows starts.

Installing Boot Loader Service

1. Disable the Boot Loader Service program as described above.

2. WES 2009

 $\label{eq:click the Windows Start button and select Control Panel > Add or Remove Programs.$

Win 7, WES 7

Click the Windows **Start** button and select **Control Panel** > **Uninstall** a program.

Win 10

In the Start menu, scroll the app list to the W section, and select Windows System > Control Panel > Programs and Features.

- 3. Select "Anritsu Boot Loader Service for MG3710A" and delete it.
- 4. Connect a USB flash drive to the external PC and copy the installer file for the Boot Loader Service to be updated to the root folder of the USB flash drive.
- 5. Dismount the USB flash drive from the external PC and connect it to the MG3710A/MG3710E/MG3740A.

- 6. Run the Boot Loader Service installer file and follow the install wizard instructions.
- 7. The updated Boot Loader Service is enabled automatically at the next restart.

9.5 Panel Keys

This section describes functions available only from keys on the front panel.

9.5.1 Preset

Preset

Press **Preset** of the panel key to display the Preset function menu.

Page	Key No.	Menu Display	Function
1	F1	Preset	Performs Preset and resets all parameters managed by this application to default values, excluding those of the Utility function.
	F3	Preset All	Resets parameters managed by this application to default values, including those of the Utility function. The user correction data is not reset to default values.
	F7	Restart	Turns the power OFF and executes restart.
	F8	Cancel	Returns to the previous menu.

Table 9.5.1-1 Preset Function Menu

Preset



Performs Preset and resets all parameters managed by this application to default values, excluding those of the Utility function.

The power meter COM Port number and model name are not initialized. Initialize with **Preset All**.

Press F1 Preset for execution.

Remote command Initialize a device. A command common to IEEE488.2 Command *RST

Details

This command initializes the settings and status of the currently loaded all applications.

Programming Example

To initialize a device. *RST *OPC? // When 1 is returned, the initialization

is complete.

Remote command	Initialize the se Command :SYSTem:PRES	ettings and status of the currently selected application
	Programming To initialize the SYST: PRES *OPC?	<pre>Example e settings and status of the currently selected application. // When 1 is returned, the initialization is complete.</pre>
Preset All	including those Table, and the	ters managed by this application to default values, e of the Utility function. In addition, List Table, Channel waveform memory (with loaded waveform file) are wever, the user correction data is not initialized. Press F3
Remote command	including thos Command Syst : SYSTem: PRES Programming	Set:ALL Example leters including those of the Utility function.

is complete.

Restart	
	Preset Restart Turns the power OFF and executes restart. It resets Remote/Local to Local, Display On/Off to On, SignalGenerator function menu to the default values, and IEEE488.2 event status processing to the power on-equivalent.
Remote command	Restart
	Command
	:SYSTem:REBoot
	Details
	This function turns the power OFF and executes restart. It resets
	Remote/Local to Local, Display On/Off to On, SignalGenerator function
	menu to the default values, and IEEE488.2 event status processing to
	the power on-equivalent.
	Programming Example
	To restart.
	SYST:REB

9.5.2 Switching Remote/Local: Local

Remote



When you press **Local** of the panel key, the remote-control state is changed to the local-control state. Then, the lit Remote LED (Remote) goes off (Local).

Remote command Switch the remote-control state to the local-control state

Command :SYSTem:COMMunicate:GTLocal

Programming Example

To switch the state to the local-control state. SYST:COMM:GTL

9.5.3 Saving parameter file: Save

The MG3710A/MG3710E/MG3740A can restore the settings by saving and loading settings of frequencies, output levels, or modulation parameters. This section describes how to save the settings.

Save

Press **Save** of the panel key to display the **Parameter Save** dialog box, the **File List** dialog box, and the Parameter Save function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu where you can set a destination drive for saving files.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F5	Delete	Deletes the specified parameter file.
	F7	Save	Saves the settings and the status of the application in a parameter file.
	F8	Cancel	Returns to the previous menu.

Table 9.5.3-1 Parameter Save Function Menu

Saving Parameter File: Save

Save >Save

Saves the settings and the status of the application in a parameter file.

Remote	command	Sav
Remote	command	Sa

Save the settings and the status of the application in a parameter file Command

:MMEMory:STORe:STATe [<string>[,<device>]]

Parameter

<string></string>	File name excluding extension
	Character string enclosed by double quotes (" ")
	or single quotes (' ') (excluding extension)
	The following characters cannot be used:
	\ / : * ? `` <i>"</i> \ / < >
	Automatically named as
	"Param[Date]_[Additional number].xml" when
	omitted.
	The additional number will be the minimum
	three-digit numerical number within 000 to 999
	which does not exist.
<device></device>	Number of the drive
Options	A to Z, currently selected drive when omitted

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\Parameter Setting\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To name a parameter file as "TEST" and saves it in D drive. <code>MMEM:STOR:STAT</code> "TEST", <code>D</code>

Deleting Parameter File: Delete

(Save)>Delete

Deletes the specified parameter file.

When the parameter file to be deleted is selected and **F5 Delete** is pressed, the **Confirmation** function menu is displayed.

Table 9.5.3-2	Confirmation Function Menu
---------------	-----------------------------------

Page	Key No.	Menu Display	Function
1	$\mathbf{F7}$	Confirm Deletion	Executes delete.
	F8	Cancel	Returns to the menu before this menu is opened.

Press F7 Confirm Deletion to delete files.

Remote command

Delete the specified parameter file

Command

:MMEMory:DELete:STATe <filename>[,<device>]

Parameter

<filename></filename>	File name excluding extension
<device></device>	Number of the drive
Options	$\ensuremath{\mathbf{A}}$ to Z, currently selected drive when omitted

Programming Example

To delete the parameter file "TEST" stored in D drive. MMEM:DEL:STAT "TEST",D

Operation method

The procedure of saving parameters is as follows:

Example: To save the currently displayed parameters in "ABC".



Figure 9.5.3-1 File Name Input Window

- 1. Press **Save** of the panel key to display the Parameter Save function menu, the **Parameter Save** dialog box, and the **File List** dialog box.
- 2. Press **F1 Drive** to specify a destination drive.

Options A to Z Default C

3. Enter "ABC" for a file name in the text box in the **Parameter Save** dialog box.

By default, the "Param[Date]_[Additional number].xml" is displayed in the text box.

4. Press **F7 Save** to save a parameter file with the entered file name.

Notes:

- Do not turn the power off while saving parameter files because they may be damaged.
- When you input a file name, an extension is automatically added. You cannot specify an extension.
- Destination path: Anritsu\MG3710A\User Data\Parameter Setting\
- Default destination name: Param[Date]_[Additional number].xml The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.
- Characters available for file names are displayed on the character pallet.
- The following characters cannot be used: $\land / : * ? " " \land / < > |$

- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Chapter 9 Other Functions

Description of Function This function allows you to save the following items:

*: Setting item common to SG1 and SG2. Other items are saved for SG1 or SG2.

Table 9.5.3-3	Items Saved in a Parameter File
---------------	---------------------------------

System	Items
Frequency setting	Frequency
function	Frequency Relative Display On/Off
	Frequency Relative Value
	Frequency Offset On/Off
	Frequency Offset
	Frequency Offset Multiplier On/Off
	Frequency Offset Multiplier
	Frequency/Channel Display
	Frequency Display On/Off
	Channel Group
	Channel Selection
	Channel Table *
	Frequency Synchronization On/Off *
	Frequency Synchronization Mode *
	Phase Noise Optimization
	RF Spectrum
	Reference Frequency Source *
	Reference Frequency * Local Signal Source
	Local Signal Output *
	Local Signal Phase
Outractional	RF Output On/Off
Output level function	Output Level
Tunction	Display Unit
	Output Level Relative Display On/Off
	Output Level Relative Value
	Output Level Offset On/Off
	Output Level Offset
	Limit Level On/Off
	Limit Level
	Output Level Synchronization On/Off *
	User Correction On/Off
	User Correction Table *
	S/N Optimization On/Off
User correction	Com Port
	Model
	Start Freq
	Stop Freq
	Level Offset On/Off
	Level Offset value
	Correction Points
	Averaging On/Off
	Averaging Count

9.5 Panel Keys

System	Items
Sweep/List function	Sweep/List Freq On/Off
	Sweep/List Freq On/Off
	Sweep/List Type *
	Sweep Repeat *
	Sweep Direction *
	Manual Mode On/Off *
	Manual Point *
	Sweep Out Setting *
	Sweep Start Frequency
	Sweep Stop Frequency
	Sweep Center Frequency
	Sweep Span Frequency
	Sweep Start Level
	Sweep Stop Level
	Sweep Point
	Sweep Dwell Time
	Sweep Type
	List Frequency Setting
	List Level Setting
	List Table *

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

Chapter 9 Other Functions

System	Items
Modulation	Modulation On/Off
function	AM Modulation On/Off
	AM Depth Scale
	AM Depth (Lin)
	AM Depth (Log)
	AM Modulation Frequency
	FM Modulation On/Off
	FM Frequency Deviation
	FM Modulation Frequency
	φM Modulation On/Off
	φM Deviation Angle
	φM Modulation Frequency
	Pulse Modulation On/Off
	Pulse Modulation Source
	Pulse Modulation Frequency
	Pulse Modulation Period
	Pulse Modulation Delay
	Pulse Modulation Width
	Pulse 2 Delay
	Pulse 2 Width
	Pulse Sync/Pulse Video Output Signal Polarity
	Pulse Mod input signal polarity
	ARB On/Off
	RMS Adjustment
	Pattern Generation Mode
	Pattern A On/Off
	Pattern B On/Off
	Pattern A Output Level
	Pattern B Output Level
	Object of Level Change
	Level Ratio Setting
	Sampling Rate A
	Sampling Rate B
	Frequency Offset
	Frequency Offset A
	Frequency Offset B
	Reference Frequency
	Start Offset
	Spectrum Reverse A
	Spectrum Reverse B
	Waveform Load List Focus *
	Load Waveform Package Name *
	Load Waveform Pattern Name *
	Sub Item *
	Waveform Load Target Memory
	Waveform Selection List Focus *
	Waveform Selection Target Memory

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

9.5 Panel Keys

System	Items
Modulation	Selected Waveform Package Name *
function	Selected Waveform Pattern Name *
	Waveform Copy List Focus *
	RF Gate On/Off
	RF Gate Edit On/Off
	RF Gate Line
	RF Gate Offset 1
	RF Gate Width 1
	RF Gate Offset 2
	RF Gate Width 2
	RF Gate Frequency
	Start/Frame Trigger On/Off
	Start/Frame Trigger Mode
	Start/Frame Trigger Source
	Start/Frame Trigger Delay
	Start/Frame Trigger Edge
	Start/Frame Trigger Event
	Baseband Reference Clock Source
	Baseband Reference Clock Division *
	Baseband Reference Clock Out *
	Marker1 Edit Mode A On/Off
	Marker1 Offset A
	Marker1 Width A
	Marker1 Cycle A
	Marker1 Polarity A
	Marker1 Edit Mode B On/Off
	Marker1 Offset B
	Marker1 Width B
	Marker1 Cycle B
	Marker1 Polarity B
	Marker2 Edit Mode A On/Off
	Marker2 Offset A
	Marker2 Width A
	Marker2 Cycle A
	Marker2 Polarity A
	Marker2 Edit Mode B On/Off
	Marker2 Offset B
	Marker2 Width B
	Marker2 Cycle B
	Marker2 Polarity B
	Marker2 Folarity B Marker3 Edit Mode A On/Off
	Marker3 Edit Mode A On/On Marker3 Offset A
	Marker3 Width A
	Marker3 Cycle A Marker2 Polonity A
	Marker3 Polarity A Marker3 Edit Mada B. Or (Off
	Marker3 Edit Mode B On/Off Marker2 Offact B
	Marker3 Offset B

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

Chapter 9 Other Functions

System	Items
Modulation	Marker3 Width B
function	Marker3 Cycle B
	Marker1 Polarity B
	Sequence Play Mode
	Sequence Repeat Mode
	Pattern Trigger On/Off
	Pattern Trigger 1 On/Off
	Pattern Trigger 1 Source
	Pattern Trigger 1 Edge
	Pattern Trigger 2 On/Off
	Pattern Trigger 2 Source
	Pattern Trigger 2 Edge
	Pattern Trigger 3 On/Off
	Pattern Trigger 3 Source
	Pattern Trigger 3 Edge
	Pattern Trigger Switching Point
	Sync Type *
	Number of Secondaries *
	Secondary Position *
	LO Sync *
	I/Q Phase
	I/Q Delay
Route Connectors	S/F Trigger *
	Pattern Trigger 1 *
	Pattern Trigger 2 *
	Pattern Trigger 3 *
	Pattern Status 1 *
	Pulse Mod *
	Pattern Trigger Type *
	Marker1 *
	Marker2 *
	Marker3 *
	Pulse Video *
	Pulse Sync *
	Sync Trig Out *
AWGN	AWGN On/Off
	Noise Bandwidth
	Carrier Level
	Noise Level
	C/N Ratio
	C/N Set Signal

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

9.5 Panel Keys

System	Items
I/Q modulation	I/Q Source
	I/Q Output
	Internal Channel Correction
	Cal Type
	Wideband
	Analog I/Q Input I Offset *
	Analog I/Q Input Q Offset *
	Analog I/Q Output I Level Trimming *
	Analog I/Q Output Q Level Trimming *
	Analog I/Q Output I/Q Common Offset*
	Analog I/Q Output I Diff Offset *
	Analog I/Q Output Q Diff Offset *
	Internal Baseband I Offset
	Internal Baseband Q Offset
	Internal Baseband Gain Balance
	Internal Baseband Quad. Angle
	Internal Baseband I/Q Phase
	Internal Baseband I/Q Skew
	Internal Baseband I/Q Delay
BER measurement	Measure Mode *
	Data Type *
	Count Mode
	Data *
	Error *
	Auto Resync *
	Threshold X *
	Threshold Y *
	at SyncLoss *
	BER Interface Clock Edge *
	BER Interface Data Polarity *
	BER Interface Enable Active *
	PN Fix Pattern Length *
	User Defined Pattern Pattern Length *
	User Defined Pattern Sync Start *
	User Defined Pattern Sync Length *
	PN Fix9 Pattern Initial
	PN Fix11 Pattern Initial
	PN Fix15 Pattern Initial
	PN Fix20 Pattern Initial
	PN Fix23 Pattern Initial
	Pattern Length
	Sync Start
	Sync Length

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

Chapter 9 Other Functions

System	Items
Power Meter	Channel A On/Off *
	Channel A Com Port *
	Channel A Model *
	Channel A Freq *
	Channel A Offset On/Off *
	Channel A Offset value*
	Channel A Averaging On/Off *
	Channel A Averaging Count value *
	Channel A Measurement Units *
	Channel B On/Off *
	Channel B Com Port *
	Channel B Model *
	Channel B Freq *
	Channel B Offset On/Off *
	Channel B Offset value *
	Channel B Averaging On/Off *
	Channel B Averaging Count value *
	Channel B Measurement Units *
Utility	GPIB Address *
-	Terminator *
	Raw Socket Port Number *
	Beep Sound *
	Power On *
Others	File Type *
	Color *
	The following items are not saved:
	Remote-control state (Remote or Local)

Table 9.5.3-3 Items Saved in a Parameter File (Cont'd)

 The type of the displayed function menu. The MG3710A/MG3710E /MG3740A always displays the top-level function menu after loading

• Status of entered/displayed dialog boxes

the setting.

- Display On/Off. Display is always recalled as On.
- Regenerating points of output signals. After loading settings, regeneration restarts based on the current conditions.

The following items are stored in settings.

- The system information (model name, product name)
- File version. It is an integer in decimal number, starting 0.
- Parameter information (ID, type, name, value, min/max value for each parameter)

A parameter file is in the xml format. It can be transmitted from an external PC to multiple MG3710As/MG3710Es/MG3740As. Refer to MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducerTM) for how to transmit it.

9.5.4 Recalling Parameter File: Recall

Recall

Press the **Recall** of the panel key to display the Parameter Recall function menu, the **Parameter Recall** dialog box, and the **File List** dialog box.

Note:

Do not turn the power off when loading a parameter file. When you turn the power off during loading, the MG3710A/MG3710E/MG3740A may start with undefined parameters.

Note:

The set parameter settings file cannot be recalled with a different option configuration.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu where you can set a source drive for loading files.
	F7	Open	Performs loading settings.

Table 9.5.4-1 Parameter Recall Fu	unction Menu
-----------------------------------	--------------

Open

 $\mathbf{F8}$

Recall > Open

Cancel

Loads the parameter file specified in the **File List** dialog box. Press **F7 Open** to load a setting file.

Returns to the previous menu.

Remote command Recall the application settings and status into a parameter file Command Command

:MMEMory:LOAD:STATe <string>[,<device>]

Parameter

<string></string>	File name excluding extension	
	Character string enclosed by double quotes (" ")	
	or single quotes (' ') (excluding extension)	
<device></device>	Number of the drive	
Options	A to Z, currently selected drive when omitted	

Programming Example

To recall settings of all applications based on the parameter file "TEST", which is saved in D drive. MMEM:LOAD:STAT "TEST", D

Chapter 9 Other Functions

Displaying a parameter file list

Reads out a list of all parameter files in the specified device.

Remote command	Query a list of all parameter files in the specified device
	Query
	:MMEMory:CATalog:STATe? <device></device>

Response

<number>,<filename_1>,<filename_2>...

Parameter

<device></device>	Number of the drive
Options	A to Z, currently selected drive when omitted
<number></number>	Number of files: 0 to 1000
<filename_n></filename_n>	File name
	When files more than 1000 exist, the command
	sorts them by file name and returns the top 1000
	files.

Programming Example

To query a list of parameter files saved in D drive. MMEM:CAT:STAT? D > 3,Param_00,Param_01,Param_02

Operation method

The procedure of loading parameters is as follows:

Example: To load a parameter file.



Figure 9.5.4-1 Parameter Recall Dialog Box

- Press Recall of the panel key to display the Parameter Recall function menu, the Parameter Recall dialog box, and the File List dialog box.
- 2. Press **F1 Drive** to select a device containing parameters to load.

Options All connected drives Default C

- 3. Parameter files in the default folder of currently specified drive are listed. To select, place the cursor on files to load.
- 4. Press **F7 Open** to load target files and the **Parameter Recall** dialog box closes.

Notes:

- File names are listed in alphanumeric order.
- If no parameter file exists, the "File not found" is displayed.
- Parameter files created with one MG3710A/MG3710E/MG3740A can be loaded by another MG3710A/MG3710E/MG3740A, but check firmware versions installed on each MG3710A/MG3710E/MG3740A. When the firmware version of the MG3710A/MG3710E/MG3740A that loads parameter files is older than the one that saves files, files cannot be loaded successfully.

9.5.5 Screen copy: Copy

Сору

Copies the screen displayed on the MG3710A/MG3710E/MG3740A and saves it in the specified folder.

Press **Copy** of the panel key to display the **Screen Copy** dialog box, the **File List** dialog box, and the Screen Copy function menu.

Page	Key No.	Menu Display	Function
1	F1	Drive C:	Displays the Drive function menu where you can set a destination drive for saving the screen copy.
	F2	File Type BMP <u>PNG</u>	Sets the file format of the screen copy.
	F3	Color Normal	Sets the color of the screen copy.
	F4	Change Focus	Moves the cursor between dialog box and file list.
	F7	Save	Copies the screen.
	F8	Cancel	Returns to the previous menu.

 Table 9.5.5-1
 Screen Copy Function Menu

Setting a destination drive for screen copies: Drive

(Copy)>Drive

Displays the Drive function menu where you can set a destination drive for saving the screen copy.

Press **F1 Drive** on the Screen Copy function menu to display the Drive function menu and set copy.

Options	All connected drives
Default	С

Setting a file format for screen copies: File Type

Copy >File Type

Sets the file format of the screen copy.

 Press F2 File Type on the Screen Copy function menu to set the copy.

BMP	Saves a copy in the BMP file format.
PNG	Saves a copy in the PNG file format (Default).

9.5 Panel Keys

Remote command

Set the file format of the screen copy Command

:MMEMory:STORe:SCReen:MODE BMP|PNG

Query

:MMEMory:STORe:SCReen:MODE?

Response

<mode>

Parameter

<mode>File formatBMPBMP formatPNGPNG format (Default)

Programming Example

To save a hardcopy in the PNG format. MMEM:STOR:SCR:MODE PNG MMEM:STOR:SCR:MODE? > PNG

Setting a color scheme for screen copies: Color

Copy Color

Sets the color of the screen copy.

Press **F3 Color** on the Screen Copy function menu to display the Copy Color function menu and set copy.

NormalColor, the same as the displayed screen (Default)ReverseColor, reversedMonochromeMonochromeReversed MonochromeEntertion (Color)

Monochrome, reversed

Remote command

Set the color of the screen hardcopy Command

:MMEMory:STORe:SCReen:THEMe NORMal|REVerse|MONochrome|MREVerse

Query

:MMEMory:STORe:SCReen:THEMe?

	Deemenee	
	Response <mode></mode>	NODM DEV MONO or MDEV
		NORM, REV, MONO or MREV
	Parameter	
	<mode></mode>	Settings of colors
	NORMal	Color, the same as the displayed screen (Default)
	REVerse	Color, reversed
	MONochrome	Monochrome
	MREVerse	Monochrome, reversed
	Programming Examp	ble
		dcopy to reverse color.
	MMEM:STOR:SCR:TH	
	MMEM:STOR:SCR:TH	EM?
	> REV	
Copying screens: Save	_	
	Copy Save	
	Copies the screen.	
	Press F7 Save on the	Screen Copy function menu to copy the screen.
Remote command	Specify file and drive	e names and save the screen copy
	Command	
	:MMEMory:STORe:S	CReen [<string>[,<device>]]</device></string>
	Parameter	
	<pre>string></pre>	File nome evoluting outencien
	<string></string>	File name excluding extension
		Character string within 100 characters enclosed by double quotes (" ") or single quotes (' ')
		(excluding extension)
		The following characters cannot be used:
		\ / : * ? `` " ` ' < >
		Automatically named as
		"Copy_[Date]_[Additional number].bmp" or
		"Copy_[Date]_[Additional number].png" when
		omitted. The additional number will be the
		minimum three-digit numerical number within
		000 to 999 which does not exist.
	<device></device>	Number of the drive
	Options	A to Z, currently selected drive when omitted

Details

A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.

A destination path to save the file is the following directory in the specified drive.

Anritsu\MG3710A\User Data\Copy Files\

Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

Programming Example

To name the screen copy as "TEST" and save it in D drive. MMEM:STOR:SCR "TEST", D

Operation method Example: To name the currently displayed screen as "ABC" and save it in monochrome.

- 1. Press **Copy** of the panel key to display the **Screen Copy** dialog box, the **File List** dialog box, and the Screen Copy function menu.
- 2. Press **F1 Drive** to select a destination drive.

Options All connected drives Default C

- 3. Press **F2 File Type** to set a file format of the screen copy to "BMP".
- 4. Press F3 Color to set colors of the screen copy to "Monochrome".
- 5. Enter "ABC" for a file name in the text box in the **Screen Copy** dialog box. By default, the "Copy [Date]_Additional number" is displayed in the text box.
- Press F7 Save. The file with the entered file name is saved, and the Screen Copy dialog box closes. To return to the previous screen without saving the Copy file, press F8 Cancel.

Notes:

- When you input a file name, an extension is automatically added. You cannot specify an extension.
- The maximum 100 characters are allowed for a file name.
- Destination path: Anritsu\MG3710A\User Data\Copy Files\
- Default destination name: Copy[Date]_[Additional number].bmp or Copy[Date]_[Additional number].png The additional number will be the minimum three-digit numerical number within 000 to 999 which does not exist.

9-75

- Characters available for file names are displayed on the character pallet.
- The following characters cannot be used: (/ : * ? " / < >)
- A space or dot "." at the beginning or the end of a file name causes a file name error, and the file cannot be saved.
- Up to 1000 files can be saved in a single folder. Saving more than 1000 files in a folder cause an error, and the file cannot be saved.

9.5.6 Functions specific to remote commands

This section describes the functions available only for remote commands.

Screen display On/Off function

Turns the LCD backlight and the display ON/OFF. Turning Off the display quickens operations because drawing is omitted.

Remote command

Turn the display On/Off

Command
:DISPlay:ENABle <boolean>

Query

:DISPlay:ENABle?

Response

<boolean> 0 or 1

Parameter

<boolean></boolean>	Screen display On/Off
OFF 0	Does not display.
ON 1	Displays (Default)

Details

When you press the **Local**, the LCD backlight automatically turns ON.

Programming Example

To disable displaying screens. DISP:ENAB OFF DISP:ENAB? > 0

Chapter 9 Other Functions

Screen power On/Off function

Turns the screen power and display On/Off. Turning the screen power Off with this command can reduce the radiated interference from the monitor. However, operating a mouse, key board, panel key, and touch panel turns the power on again with the control of Windows.

Remote command

Turn On the screen power Command :DISPlay:POWer:ON

Turn Off the screen power Command :DISPlay:POWer:OFF

Programming Example To turn Off the screen power. DISP:POW:OFF

9.5.7 Calibration



Press **Cal** of the panel key to display the Calibration function menu.

Page	Key No.	Menu Display	Function
1	F1	Calibrate Level	Performs the level calibration.
		Calibrate Level	Refer to 5.3.6 "Calibrate Level".
	F2	I/Q Cal	Displays the IQ Calibration function menu to set the settings related to I/Q quadrature modulator calibration.
			Refer to 7.6.1 "I/Q Calibration".
	F3	Internal Channel Correction <u>Off</u> On	Enables/disables the baseband in-band correction. Refer to 7.6 "IQ Modulation".
	F8	Cancel	Returns to the menu before this menu is opened.
		Notes:	

Notes:

- Execute Calibrate Level while the device to be tested is connected to the RF connector of the MG3710A/MG3710E/MG3740A.
- Executing Calibrate Level with the RF connector opened may • degrade the level accuracy of output signals because of reflection.

9.6 Touch Panel

The MG3710A/MG3710E/MG3740A has the touch panel function. Aged deterioration of touch panels may cause constellations to be less accurate than at the time of deployment. In such a case, we recommend you to calibrate them again. This section describes how to calibrate them.

To calibrate the touch panel:

When the OS is other than Win 10

- 1. Press Context on the front panel or right click, and click the **Show the Desktop** on the displayed menu.
- 2. Select Start > All Program > DMC > DMC Touch Panel Configuration to start the property.

When the property starts, the **User Account Control** may be displayed. Then, click **Yes**.

3. In the setting tool, click the **Calibration** button on the upper left. Set calibration screen points (Calibration points) and calibration timeout (Timeout(s)) in second.

Note:

Do not change other settings.

- 4. In the setting tool, click the **Calibration** button on the upper right. The calibration screen is displayed.
- 5. Touch calibration points, which are intersection points in the calibration screen and displayed sequentially. When you touch one calibration point, the next one is displayed.
- After touching all calibration points, the OK button is displayed. When you touch all points successfully, press the OK button.

Note:

When you touch items other than calibration points by mistake, press the **Esc** or just wait for 15 seconds* with doing nothing. The **Timed out** dialog box is displayed after 15 s. Click the **OK** button to discard the executed calibration without saving it and return to the status for performing calibration again. Clicking **Cancel** returns to step 4 in the procedure.

*: 15 seconds is the default timeout value. It can be changed at Timeout(s).

For details, refer to the *TSC-DD User's Guide* for the DMC touch panel application included in the attached CD.

When the OS is Win 10

- 1. Press Context on the front panel or right click, and click the **Show the Desktop** on the displayed menu.
- 2. Select **Start > DMC > DMC DD** to display the **Touch Screen Properties** window.

Device Addition	Touch Panel Device List			Disabled COM port search [
Basic Setting	TP Driver	COM Port	COM Port	COM Port		
Monitor Setting	(USB) ID:1	(LPT1) Unconnected	(COM1) Unconnected	(COM9) Unconnected		
Touch Setting						
Mouse Setting						
Tool Setting						
Exit	List Update			sinstall:	11 -	

- 3. Select **Basic Setting**.
- 4. In the Software Setting tab, click the **9Point** button in the Calibrate area to start the calibration.

	Touch Screen Proper	ties		-	×
[3]	Device Addition	Device Select (USB)ID:1			
	Basic Setting	Software Setting Touch Input Setting Edge Set	ting Touch Sound Ha	rdware Settin	g Hardwy • •
	Monitor Setting	Software Setting Rotation [degree] 0 90 180 270 	Auto Function		
[4]	Touch Setting			Ent	ry
	Mouse Setting	Calibrate	Timeout (sec)		
[6]	Tool Setting	4Point 9Point	None () 15	O 30	0 60
[6]	┝───	Check Reset	EEPROM EEPROM is not four	nd.	
	Exit				

5. Tap 9 red sun crosses that appear on the screen in the order of appearance.

Note:

Press the $\ensuremath{\text{Esc}}$ to abort the calibration.

[5]	€	
		Tap the each cross on the screen as it appeared in order to input a calibration sample.
		to input a calibration sample. If you want to stop inputting a calibration sample, press the ESC button Do not change the display orientation until calibration is completed.

6. After tapping the 9 calibration points, the Calibrate dialog box is displayed. Press the OK button.
When the window of Step 4 is displayed, press the Exit button to finish.

For details, refer to the *DMT*-*DD User's Guide* for the DMC touch panel application included in the attached CD.

9.7 Setting Windows

The MG3710A/MG3710E/MG3740A uses Windows as an OS.

Settings for Windows and the system can be operated by connecting a mouse and a keyboard.

This section describes how to perform operations on Windows installed to the MG3710A/MG3710E/MG3740A and general notes.

Note:

The setting method varies depending on the CPU and operating system you are running. Check your CPU and operating system as below before starting the Windows setting.

How to check your CPU and operating system

Connect the mouse to MG3710A/MG3710E/MG3740A and perform the steps below.

1. Click the **Start** menu on the Windows taskbar.

When the Start menu is displayed as below, go to Step 4 and 5. Otherwise, go to Step 2 and 3.



- 2. Right-click on **My Computer** or **Computer** to display the menu and select **Properties**.
- 3. Find out the operating system from the window design and the Processor and System types displayed.

Figure 9.7-1Windows Embedded Standard 2009 (WES 2009)Figure 9.7-2Windows 7 Professional (Win 7)

Figure 9.7-3 Windows Embedded Standard 7 (WES 7)

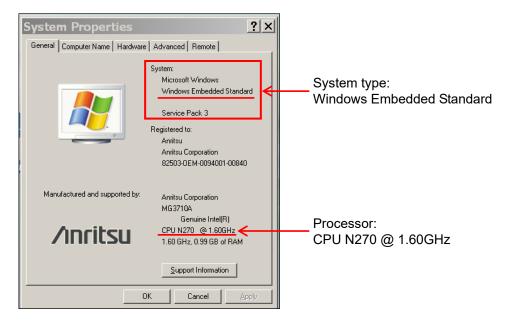


Figure 9.7-1 Windows Embedded Standard 2009 (WES 2009)

9.7 Setting Windows

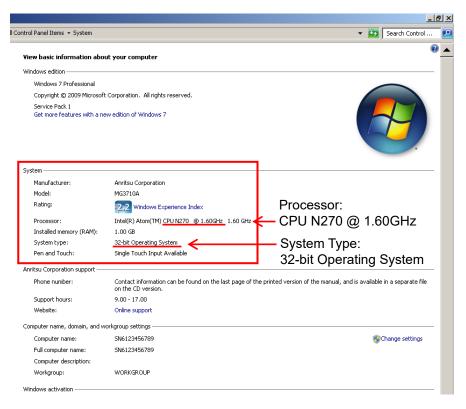


Figure 9.7-2 Windows 7 Professional (Win 7)

rol Panel Items 👻 System			▼ ¹ / ₂	Search Control Panel	
/iew basic information abo	ut your computer				
Vindows edition					
Windows Embedded Standa	rd			\bigcirc	
Copyright © 2010 Microsoft	Corporation. All rights reserved.				
Service Pack 1					
jystem					
Manufacturer:	Anritsu Corporation		Processor:		
Rating:	System rating is not available				
Processor:	Intel(R) Celeron(R) CPU 2000E @ 2.20GHz	2.20 GHz	CPU 2000	E @ 2.20GH	Z
Installed memory (RAM):	4.00 GB		0		
System type: Pen and Touch:	64-bit Operating System		System typ		
Pen and Touch:	Single Touch Input Available		64-bit Ope	rating Syster	n
Anritsu Corporation support —			•	0,	
Website:	Online support				
Computer name, domain, and w	orkgroup settings				
Computer name:	SN6123456789			🛞 Change se	ttings
Full computer name:	SN6123456789				
Computer description:					
Workgroup:	WORKGROUP				
Windows activation					
Windows is activated				adk for	~

Figure 9.7-3 Windows Embedded Standard 7 (WES 7)

- 4. Click Settings 🐼.
- 5. Click **About** to display the system information and check **Processor** and **Edition**.

\leftarrow Settings			
வ் Home	About		
Find a setting	Device specifications		
System	MG3710A	5	
Notifications & actions	Processor Intel(R) Core(TM) i5-7440EQ CPU @ 2.90GHz 2.90	Processor: CPU @ 2.90GHz	
C Notifications & actions	Installed RAM 8.00 GB		
 Focus assist 	Device ID		
	Product ID		
() Power & sleep	System type 64-bit operating system, x64-based processor		
	Pen and touch No pen or touch input is available for this display		
📼 Storage			
	Rename this PC		
-문 Tablet mode			
日 Multitasking			
9.0 m · · ·	Windows specifications		
X Shared experiences	Edition Windows 10 Enterprise LTSC	Edition:	
🛱 Clipboard	Version 1809	Windows 10	
	Installed on 11/26/2019		
Remote Desktop	OS build 17763.864		
	Change product key or upgrade your edition of Windows		
 About 	Read the Microsoft Services Agreement that applies to our services		

Figure 9.7-4 Windows 10 IoT (Win 10)

Setting Windows

The MG3710A/MG3710E/MG3740A is set to default settings at factory shipment so as to perform optimal measurements. Changing the Windows settings without instructions is outside the scope of operation warranty. In addition, performance may drop or functions may not operate correctly when Windows settings are changed. Carefully read the general notes of this section when changes to Windows settings are required.

When the system fails to operate correctly due to Windows operation, execute system recovery functions to restore the MG3710A/MG3710E/MG3740A to its status at factory shipment. Refer to 9.7.6 "System Recovery Functions" for details.



MG3710A/MG3710E/MG3740A operations are not guaranteed when Windows settings are changed from their default shipment status without instructions, or when a program not guaranteed by Anritsu Corporation is installed.

Windows Embedded prohibits the installation of applications by user.



Performing system recovery will cause software installation (including updates) after factory shipment of the MG3710A/MG3710E/MG3740A and application settings to be lost. In addition, data (measurements, parameters, etc.) recorded by the customer may be deleted depending on the method to perform system recovery.

9.7.1 Displaying Windows desktop

Connect a mouse and a keyboard to operate Windows. Use a USB mouse and a keyboard (USB) for applicable part.

The following are methods to display the Windows desktop. To display applications of the MG3710A/MG3710E/MG3740A again, press SG1 or SG2, or select an application in the Windows Taskbar.

Show Windows desktop

<u>Mouse</u>

- Right-click anywhere on the screen, and click the **Show the Desktop** on the displayed list to display the Windows desktop.
- Click the "Minimize" button located in the upper right corner of the application window of the MG3710A/MG3710E/MG3740A. Minimizing all applications displays the Windows desktop.
- Press Context on the front panel, and click the **Show the Desktop** on the displayed list to display the Windows desktop.

Keyboard

Pressing the Windows logo key + D minimizes all windows and displays the Windows desktop.

Show Start button

When the OS is WES 2009

- The **Start** button appears on the left side of the Windows taskbar at the bottom of the Windows desktop.
- On the application window, move the mouse pointer to the bottom of the screen to display the Windows taskbar. The **Start** button appears on the left side of the Windows taskbar.

When the OS is Win 7, WES 7, or Win 10

• On the Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar. The **Start** button or **Start** icon appears on the left side of the Windows taskbar.

Show Start menu

<u>Mouse</u>

• Click the **Start** button or **Start** icon to display the start menu.

Keyboard

• Press the **Windows logo key** 🔣 to display the start menu.

Show Control Panel

When the OS is other than Win 10

• Click the **Control Panel** in the start menu.

When the OS is Win 10

• Click Windows System > Control Panel in the W column of the app list displayed.

9.7.2 Setting control panel

Various Windows settings can be configured using the Control Panel. The following describes general notes on each setting. Although each setting can be set without using the Control Panel, use within the scope of the following restrictions.

The MG3710A/MG3710E/MG3740A may not operate normally when any other Windows settings are changed from the factory defaults.

Program and Hardware

- Do not delete the installed devices or update/delete the drivers.
- The MG3710A/MG3710E/MG3740A may not operate normally due to conflicts with device drivers when new hardware is added.
- Do not update or remove programs installed at the factory.
- Anritsu does not warrant operations of the MG3710A/MG3710E/MG3740A when programs not guaranteed are installed.

Windows Update

• Automatic updating of Windows is turned off at the factory. Refer to 9.7.7 "Windows Security Measures" for details.

Network Connection

- TCP/IP settings may change when the MG3710A/MG3710E/MG3740A is remote-controlled through Ethernet. Refer to E.3.2 "Ethernet interface settings".
- The IP address is set to use DHCP before shipment from the factory. Ensure that the network administrator settings are appropriate when connecting the MG3710A/MG3710E/MG3740A to a network.

User Account

• Automatic login with the following settings is enabled at the factory. Do not change the User Account settings shown below.

Account Name	"ANRITSU"	
Password	"anritsu"	(Other than Win 10)
	"ANRITSU"	(Win 10)
Account Type	Computer Administrator	

• New user accounts can be created. Specify "Computer Administrator" for the account type of the user account to be created. Applications will not start up normally with user accounts created using Limited (Power User).

Security

- Windows Firewall setting depends on the factory shipping date as show below.
 - Shipped in or before September 2018 Off
 - Shipped in or after October 2018 On

Refer to 9.7.7 "Windows Security Measures" for details.

When the setting is changed from Off to On, Windows Firewall displays a dialog box asking if you want to block the applications of the MG3710A/MG3710E/MG3740A at the next startup time. Be sure to click **Unblock**.

- Antivirus software is not installed at the factory. Anritsu strongly recommends installing antivirus software when connecting the MG3710A/MG3710E/MG3740A to a network. However, the MG3710A/MG3710E/MG3740A may not be remote-controlled through Ethernet if the function blocking external communications works.
- Security warnings are not displayed by factory default.

Date & Time

- You can change the date, time and time zone.
- Internet Time is set to Off by factory default. Operations may be affected; therefore, do not change this setting.

<u>Display</u>

- This setting must be changed when using an external monitor with connected to the VGA connector of the MG3710A/MG3710E/MG3740A. Refer to Section 9.7.3 "Using external display" for details.
- Operations may be affected by changing screen resolution, refresh rate or monitor power management or turning on the screen saver.

System

- The Computer Name can be changed. The factory default name is "SN" + "Serial Number".
- Do not change Hardware or Advanced settings.
- Do not enable the System Restore. Otherwise, the MG3710A/MG3710E/MG3740A may not operate normally.

Power Options

- The settings for the Auto Power Off function (Turn off Monitor) of the display can be changed.
- The Power Off function of the SSD (Turn off Hard Disks) is disabled (Never). Do not change this setting.
- Do not change the Power options settings other than those described above. The MG3710A/MG3710E/MG3740A will not operate normally after recovering from hibernation.

<u>Fonts</u>

• Fonts required for applications of the MG3710A/MG3710E/MG3740A are installed at factory shipment; therefore, do not delete these fonts.

Printer and Faxes

• Printers and fax machines can be set. However, operations are not guaranteed in the event print drivers or relevant applications affect the MG3710A/MG3710E/MG3740A.

Regional and Language Options

• Do not change this setting. Applications may not operate normally.

9.7.3 Using external display

An external display can be connected to the VGA connector on the rear side of the MG3710A/MG3710E/MG3740A, to display screens of the MG3710A/MG3710E/MG3740A and show multiple displays. The following describes the operation procedure for this function.

88 ics Media Scheme Options 🛃 Notebook and Monitor Single Display **Display Devices** Notebook O Monitor **Display Settings Multiple Display** Color Correction Primary Device Twin Notebook Hot Keys O Intel(R) Dual Display Clone Extended iii Secondary Device Desktop (intel) Monitor Launch Zoom 3D Settings Information Video Overlay oĸ Cancel Apply

When the OS is other than Win 10

Figure 9.7.3-1 Intel[®] GMA Driver

<Procedure>

1. Connect the display to the VGA connector on the rear side of the MG3710A/MG3710E/MG3740A.

When using Win 7 or WES 7, the connected external display and the main unit display are set automatically to the same display (mirroring).

- 2. Display the Intel[®] GMA Driver Settings screen using any of the following methods.
 - Execute "Intel[®] GMA Driver for Mobile" from the Windows Control Panel. For the Control Panel display method, refer to sections 9.7.1 "Displaying Windows Desktop" and 9.7.2 "Setting Control Panel".
 - Press Ctrl + Alt + F12 on the keyboard. (Only WES 2009)

- 3. Click the **Display Devices**, and change the settings as shown below:
 - When not using an external display
 - Single Display Notebook
 - When using only an external display
 - Single Display Monitor

<u>When displaying the MG3710A</u>/MG3710E/<u>MG3740A display to an</u> <u>external display</u>

- Multiple Display Twin or Intel[®] Dual Display Clone
- Primary Device Notebook
 - (MG3710A/MG3710E/MG3740A display)
- Secondary Device Monitor

<u>When displaying with the MG3710A</u>/MG3710E/<u>MG3740A and</u> <u>external display connected</u>

- Multiple Display Extended Desktop
- Primary Device Notebook (MG3710A/MG3710E/MG3740A display)
- Secondary Device Monitor
- 4. Press either the **OK** or **Apply** button.

When the OS is Win 10

Intel® HD Gr	raphics Control Par	hel		_ 🗆 X
🛈 Display				(intel)
General Settings	Select Display Mode	(7)	Arrange Displays	0
Color Settings	Single Display			
Multiple Displays	Clone Displays			
Custom Resolutions	✔ Extended Desktop		1	2
	Select One or More Active Displays			
	1 Primary Display			
	Built-in Display		Detect	Identify
Select Profile	Digital Display			
Current Settings 🗸 🗸				
	(Ð	×	\odot

Figure 9.7.3-2 Intel[®] HD Graphics Control Panel

<Procedure>

- 1. Connect the display to the VGA connector on the rear of MG3710A/MG3710E/MG3740A.
- 2. Open the Intel[®] HD Graphics Control Panel by the following method:
 - Display the Windows desktop, right-click an empty area on the screen, and click the Intel[®] Graphics Settings on the displayed list.

3.	Click Display > Multiple Di	isplays , and then change the settings.		
	When not using an external display			
	Select Display Mode	Single Display		
	Select One or More Activ	elect One or More Active Displays		
		Built-in Display		
		(MG3710A/MG3710E/MG3740A display)		
	When using only an extern	al display		
	• Select Display Mode	Single Display		
	Select One or More Active Displays			
		(Connected external display)		
	When displaying the same	content on each of		
	MG3710A/MG3710E	/MG3740A display and external display		
	Select Display Mode	Clone Displays		
	Select One or More Active Displays			
		Built-in Display		
		(MG3710A/MG3710E/MG3740A display)		
		(Connected external display)		
	<u>When displaying with MG3710A/MG3710E/MG3740A and external</u>			
		display connected		
	Select Display Mode	Extended Desktop		
	Select One or More Activ	Select One or More Active Displays		
	1. Primary Display	Built-in Display		
		(MG3710A/MG3710E/MG3740A display)		
	2.	(Connected external display)		

▲ CAUTION

Turning the MG3710A/MG3710E/MG3740A power On when an external display is not connected to the VGA connector initializes to mainframe display only. When continuously using an external display, it is recommended to keep the external monitor connected for use.

Do not change the resolution, refresh rate or power management settings of the mainframe monitor.

9.7.4 General notes

Besides the general notes on the previous section, note the following operations.

- Operations of the MG3710A/MG3710E/MG3740A are guaranteed at factory shipment status. However, if programs including Windows Update are added or updated without instructions, the operations are not guaranteed.
- When third party software is installed and/or executed, this may affect MG3710A/MG3710E/MG3740A operations.
- Note that the MG3710A/MG3710E/MG3740A may not operate normally when registries are changed.

9.7.5 Storage device configuration

The MG3710A/MG3710E/MG3740A has a built-in hard disk for storing the OS, application software, user data, and the like.

The hard disk of the MG3710A/MG3710E/MG3740A consists of the following partitions.

Volume C: System Disk

Windows, application software and files required for operation of the MG3710A/MG3710E/MG3740A are stored. Also, it is used as the destination for file input or output for application software of the MG3710A/MG3710E/MG3740A. The MG3710A/MG3710E/MG3740A may not operate normally when data necessary for operations of the MG3710A/MG3710E/MG3740A is changed or deleted.

Volume D: 2nd Hard Disk (when the 2ndary HDD option is installed)

This volume is used mainly for inputting files to and as the output destination for the application software of the MG3710A/MG3710E/MG3740A. Adding data to this volume or deleting data on it will not affect MG3710A/MG3710E/MG3740A operations.

A USB flash drive, used for installing application software and inputting or outputting data, is included as standard equipment with the MG3710A/MG3710E/MG3740A.

Volume D: USB flash drive (when the 2ndary HDD option is not installed)

Volume E : USB flash drive (when the 2ndary HDD option is installed)

Note the following items when operating MG3710A/MG3710E/MG3740A:

- Do not change the partition configuration. Doing so may affect system operation.
- Do not format the hard disk of the MG3710A/MG3710E/MG3740A. Besides the above, data for system recovery is stored within this hard disk. Recovery may become inoperable when the hard disk is formatted.
- The volumes and folders described above are not set to be shared at factory shipment. Although sharing is an effective means for transferring data to and from an external PC, be mindful of security when connecting to a network.

9.7.6 System Recovery Functions

The MG3710A/MG3710E/MG3740A has system recovery functions to restore data on the hard disk to the factory shipment status. These functions can be used in the event of system instability.

The backup can be obtained by copying the User Data folder in the path: C:\Anritsu\MG3710A.

For Win 7, WES 7, or Win 10, copy the User Data folder in the path: D:\Anritsu\MG3710A as well, because some data may be stored there.

When the OS is other than Win 10

The MG3710A/MG3710E/MG3740A comes with factory-installed recovery software, Phoenix Recover Pro or Paragon Drive Backup. To confirm the installed recovery software, start the MG3710A/MG3710E/MG3740A, and press the **F4** on the BIOS screen to start the recovery software.

<Procedure>

- 1. Disconnect the MG3710A/MG3710E/MG3740A from the network if connected.
- 2. Connect the keyboard and mouse to the mainframe, and then turn the MG3710A/MG3710E/MG3740A power On. The BIOS screen will appear in a few seconds after.
- 3. Press the **F4** (not an on the front panel of the mainframe) while the screen in Step 2 is displayed.
- 4. Only when the screen displays the message "Press F4 to start recovery from Backup Capsule", press the **F4** again.
- 5. According to the software instructions on the screen, perform a system recovery.

Phoenix Always

Refer to 9.7.6.1 "Phoenix Recover Pro".

Paragon Drive Backup

Refer to 9.7.6.2 "Paragon Drive Backup".

To execute these functions, understand the following items for their use.

- All applications and updates added after factory shipment will be lost. Additionally, all data recorded to C Drive will be restored to the factory shipment status. Backup important data before executing these functions.
- For Win 7 or WES 7, the area of D Drive can be restored to the factory shipment status depending on the function to be selected. So as not to lose important user data due to incorrect operations, it is recommended to backup data in D Drive before executing these functions.
- Data deleted by these functions cannot be restored.
- When the Paragon Drive Backup software is installed, the backup data is saved to an unknown partition on the Disk 0. If the unknown partition is accidentally deleted, the backup data required for system recovery is deleted as well.

When the OS is Win 10

The MG3710A/MG3710E/MG3740A has the standard Windows system recovery functions. See 9.7.6.3 "Windows Backup" for the system recovery procedure.



To execute these functions, understand the following items for their use.

- All applications and updates added after factory shipment will be lost. Additionally, all data recorded to Volume C and D will be restored to the factory default. Backup important data before executing these functions.
- Unlike WES 2009 and WES 7, the Win 10 system recovery functions cannot restore only Volume C to the factory default. Data stored on both Volume C and D will be restored to the factory default.
- Data deleted by these functions cannot be restored.

9.7.6.1 Phoenix Recover Pro

This subsection describes how to perform a system recovery with factory-installed recovery software "Phoenix Recover Pro".

Restore System drive (partition) only

This function restores only C Drive, in which Windows, application software, and files required for operations of the MG3710A/MG3710E/MG3740A are stored, to the factory shipment status.

Restore entire hard disk

This function restores C Drive to the factory shipment status. For Win 7 or WES 7, it restores D Drive to the factory shipment status as well, deleting all data.

<Procedure>

1. After the screen displaying "Phoenix Always" appears, the following alternatives are displayed on the screen:

Restore System drive (partition) only

Recovers only C Drive.

Restore entire hard disk

Recovers C Drive (including D Drive for Win 7 or WES 7).

Select one of the two alternatives, and then click [NEXT]. To cancel, press and hold the [Power] button of the mainframe to power off.

2. After clicking [NEXT], the confirmation screen appears. Click [OK] to start a system recovery. Although the required time for recovery varies depending on the conditions, it normally takes between 10 and 30 minutes. The progress of recovery is shown during recovery. Although the progress indicator may close during recovery, this is a normal operation.

The MG3710A/MG3710E/MG3740A will restart automatically then normal startup will be executed.

Chapter 9 Other Functions

9.7.6.2 Paragon Drive Backup

This subsection describes how to perform a system recovery with factory-installed recovery software "Paragon Drive Backup".

Type: Partition

This function restores only C Drive, in which Windows, application software, and files required for operations of the MG3710A/MG3710E/MG3740A are stored, to the factory shipment

Type: Disk

status.

This function restores C Drive to the factory shipment status. For Win 7 or WES 7, it restores D Drive to the factory shipment status as well, deleting all data.

<Procedure>

1. After the screen displaying "Drive Backup" appears, the following alternatives are displayed on the screen:

Normal Mode, Safe Mode

Select Normal Mode with the arrow keys, and then press the Enter.

- 2. When the menu screen appears in about a minute, double-click **Simple Restore Wizard**.
- 3. The Paragon Simple Restore Wizard appears, so click Next.
- 4. The following alternatives are displayed on the screen:

Type: Partition

Recovers only C Drive.

Type: Disk

Recovers C Drive (including D Drive for Win 7 or WES 7).

Double-click either of them, and then click Next.

5. When the confirmation screen appears, click **Yes** to start a system recovery. Then, the **Progress information** screen appears, and the recovery process starts.

Do not click **Cancel** when a system recovery is in progress.

Although the required time for recovery varies depending on the conditions, it normally takes between 10 and 30 minutes. The progress of recovery is shown during recovery. Although the progress indicator may close during recovery, this is a normal operation.

- 6. Upon completion of the recovery process, click **Close**. (**Close** appears after the recovery process is completed.)
- 7. When the completion screen appears, click **Finish** to return to the menu screen described in Step 5. Click **Reboot the computer** to reboot the MG3710A/MG3710E/MG3740A, or click **Power off** to turn the power Off.

9.7.6.3 Windows Backup

This subsection describes how to perform a system recovery when the installed OS is Win 10.

<Procedure>

- 1. Disconnect the MG3710A/MG3710E/MG3740AA from the network if connected.
- 2. Connect the keyboard and mouse to the mainframe, and then turn the MG3710A/MG3710E/MG3740A power On.
- 3. While the Anritsu logo is displayed, press **F8** on the keyboard.
- 4. The boot options menu is launched. Select **Repair Your computer**, and then press the **Enter**.
- 5. The **Choose an option** appears, select **Troubleshoot**, and press **Enter**.
- 6. The Troubleshoot appears, select Advanced options, and press Enter.
- 7. The **Advanced options** appears, select **System Image Recovery**, and press **Enter**.
- 8. The System Image Recover appears, select ANRITSU, and press Enter.
- 9. When you are prompted to enter a password, enter "ANRITSU", and then click **Continue**.
- 10. The Select a system image backup appears, select Use the latest available system image (recommended), and click Next.
- 11. The **Choose additional restore options** appears, and click **Next** without any changes.
- 12. When "Your computer will be restored from the following system image:" appears, click **Finish**.
- 13. When the confirmation screen appears, click **Yes** to start a system recovery.

The Progress bar appears, and the recovery process starts. Do not click **Stop restore** when a system recovery is in progress. Although the required time for recovery varies depending on the conditions, it normally takes between 20 and 30 minutes.

14. After the system recovery is completed, the MG3710A/MG3710E/MG3740A restarts automatically, and Windows starts.

9.7.7 Windows Security Measures

To apply security measures described in this section, the MG3710A /MG3710E/MG3740A must run WES 7 or Win 10.

The following options upgrade the CPU and operating system.

MG3710A /MG3710E/MG3740A-182: Upgrades to Win 10.

In terms of security measures and antivirus, we do not recommend connecting the MG3710A/MG3710E/MG3740A running WES 2009 or Win 7 to a network.

"C1" label is affixed on the rear panel of the MG3710A/MG3710E/MG3740A that runs on WES 7.

"C2" label is affixed on the rear panel of the MG3710A/MG3710E/MG3740A that runs on Win 10.

When connecting the MG3710A/MG3710E/MG3740A with WES 7 or Win 10 to a network, in addition to connecting to secure and virus-protected networks, the following procedures are recommended in order to add protection against malware (malicious software) and viruses.

- Activating firewall
- Installing Windows important update programs
- Using antivirus software

When the OS is WES 7

The security measure settings condition of this equipment can be confirmed from the Control Panel of Windows.

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- 2. Move the mouse pointer to the bottom of the screen to display the Windows taskbar. Click **Start** > **Control Panel**.
- Set "View by: Category" at the upper right of the Control Panel, click System and Security > Action Center.
- 4. Click Security, and confirm security measures settings condition.

When the OS is Win 10

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- Move the mouse pointer to the bottom of the screen to display the Windows task bar. Click the Start icon to open the Start menu, and then click Windows System > Control Panel in the W column of the app list displayed.
- 3. Set "View by: Category" at the upper right of the Control Panel, click System and Security > Security and Maintenance.
- 4. Click **Security**, and confirm security measures settings condition.

Note:

Security warnings are not displayed by factory default.



When connecting this equipment to the Internet or to an external network, there is a possibility an unpredictable problem or damage may occur. Anritsu Corporation does not recompense for any damage caused by connecting this equipment to a network.



Adding any options or repair may restore the Windows settings to factory default settings. In this case, reinstall Windows updates, turn the firewall on again, and reinstall antivirus software.

Chapter 9 Other Functions

9.7.7.1 Activating Firewall

It is recommended to turn On the Windows firewall on this equipment.

When the OS is WES 7

Windows firewall On/Off setting (WES 7):

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- 2. Move the mouse pointer to the bottom of the screen to display the Windows task bar. Click **Start** > **Control Panel**.
- Set "View by: Category" at the upper right of the Control Panel, click System and Security > Windows Firewall to show Windows Firewall window.

Note:

Windows firewall might be turned off by default on the equipment released in or before September 2018.

4. Click **Turn Windows Firewall on or off** found in left side of Windows Firewall window.

🕒 🕑 🗢 🕍 🕨 Control Panel 🕨	System and Security Windows Firewall		- 47	Search Con 🔎
Control Panel Home	Help protect your computer wit	th Windows Firewall		
Allow a program or feature through Windows Firewall	Windows Firewall can help prevent hacke through the Internet or a network.	ers or malicious software fro	m gaining access to your computer	
Change notification settings	How does a firewall help protect my com	iputer?		
Turn Windows Firewall on or	What are network locations?			
off Restore defaults	Home or work (private) networks	Not Connected 📎	
Advanced settings	Public networks		Connected 🙆	
Troubleshoot my network	Networks in public places such as airpo	rts or coffee shops		
	Windows Firewall state:	On		
	Incoming connections:	Block all conn list of allowed	ections to programs that are not on the programs	
	Active public networks:	🧮 Unidenti	fied network	
	Notification state:	Do not notify new program	me when Windows Firewall blocks a	
See also				
Action Center				
Network and Sharing Center				

Figure 9.7.7.1-1 Windows Firewall Window

5. Customize Settings window will be shown where Windows firewall On/Off settings can be changed.

Use this equipment with the following checkboxes Off (unchecked).

- Block all incoming connections, including those in the list of allowed programs
- Notify me when Windows Firewall blocks a new program

9.7 Setting Windows

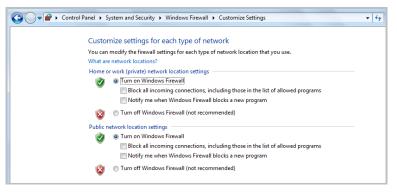


Figure 9.7.7.1-2 Customize Settings Window

Confirmation and setting of allowed programs through Windows firewall (WES 7):

Even if Windows firewall is On, in order for this equipment to operate properly, it is necessary to set as allowed programs those that enable external communication from this equipment.

Note:

The factory default setting for allowed programs might not be set properly on the equipment released in or before September 2018.

1. Use the mouse to click **Allow a program or feature through Windows Firewall** found in left side of Windows Firewall window.

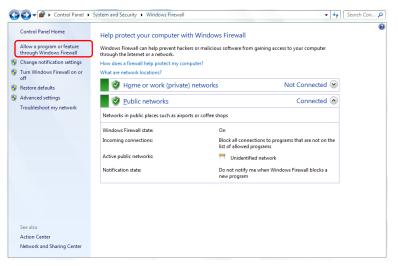


Figure 9.7.7.1-3 Windows Firewall Window

2. Allowed Programs window will be shown where programs allowed through Windows firewall can be confirmed.

Confirm that **FTP Server** (used to transfer the waveform data from IQproducer on an external PC to this equipment) is found and is set to On (checked) under **Allowed programs and features**.

If **FTP Server** is set to Off (not checked), set it to On (checked) and click **OK**.

📸 Allowed Programs	
🚱 🕞 🖉 🝷 Control Panel 👻 System and Security 👻 Windows Firewall 👻 Allowed Programs	▼ 🔯 Se
Allow programs to communicate through Windows Firewall To add, change, or remove allowed programs and ports, click Change settings. What are the risks of allowing a program to communicate? Allowed programs and features: Name	Change settings
BranchCache - Peer Discovery (Uses WSD) Connect to a Network Projector Ø Core Networking Distributed Transaction Coordinator Pierand Printer Sharing FIP Server HomeGroup ScSI Service	
Key Management Service Media Center Extenders Netlogon Service Metiogon Service Performance Looc and Alexte	Details Remove
	Allow another program

Figure 9.7.7.1-4 Allowed Programs Window

Confirm that **SignalGenerator** (used to control this equipment by a control PC) is found and is set to On (checked) under **Allowed programs and features**.

When no such information is displayed, it is necessary to add **SignalGenerator**.

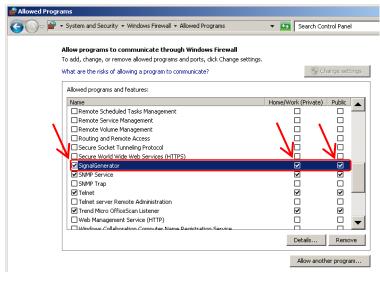


Figure 9.7.7.1-5 Allowed Programs Window

Procedure to add SignalGenerator when it is not registered (WES 7):

1. Use the mouse to click **Allow another program...** found in Allowed Programs display.

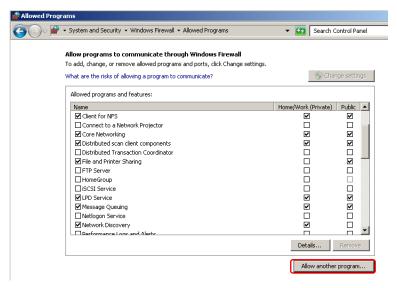


Figure 9.7.7.1-6 Allowed Programs Window

2. Click Browse... to show Browse window of Add a Program.



Figure 9.7.7.1-7 Add a Program Window

3. Browse window of Add a Program is shown.

Select C:\Anritsu\MG3710A\Program Files\SignalGenerator.exe, and click **Open**.

🕷 Browse			×
💮 💮 🕨 • Ani	tsu 🔻 MG3710A 👻 Program Files 👻 🛛 👻 🔯	Search Program Files	<u> 2</u>
Organize 🔻 New fo	Jer		
☆ Favorites	Name ~	Date modified	Туре 🔺
Desktop	Log	1/19/2018 11:25 AM	File fold
Downloads	Joftware Objects	1/29/2018 4:28 PM	File fold
📃 Recent Places	BootLoaderService	12/16/2016 3:39 PM	Applica
	ChangeCPU	1/23/2018 10:49 AM	Applica
📜 Libraries	🔒 DriverLayerApp	1/23/2018 10:49 AM	Applica
Documents	EnvironmentFixTool	1/23/2018 10:49 AM	Applica
Music Fictures	JTAGInstal	1/23/2018 10:49 AM	Applica
Videos	R KeyService	1/23/2018 10:49 AM	Applica
	LogServer	1/23/2018 10:49 AM	Applica
👰 Computer	MainteToolMain	1/23/2018 10:49 AM	Applica
🏭 Windows (C:)	RASService	1/23/2018 10:49 AM	Applica
👝 System (D:)	SignalGenerator	1/23/2018 10:46 AM	Applica 🔽
👊 Network	 ▼ ▲ 		
	File name: SignalGenerator	Applications (*.exe;*.com	(*lic) 🔻
		Open Ca	ancel

Figure 9.7.7.1-8 Browse Window of Add a Program

4. In Add a Program window, select SignalGenerator, and click Add.

Add a Program 🔀
Select the program you want to add, or click Browse to find one that is not listed, and then click OK.
Programs:
b Create a System Repair Disc
S Intel® Management and Security Status
🔁 Intel® Rapid Storage Technology
Enternet Explorer
<i>(</i> Internet Explorer (64-bit)
N IQproducer
🦻 OfficeScan Agent
SignalGenerator
Tuninstall OfficeScan Agent
KING Viewer
Path: C:\Anritsu\MG3710A\Program Files\SignalGen Browse
What are the risks of unblocking a program?
You can choose which network location types to add this program to.
Network location types Add Cancel

Figure 9.7.7.1-9 Add a Program Window

5. SignalGenerator is added to Allowed programs and features.

Confirm if SignalGenerator is found and set to On (checked).

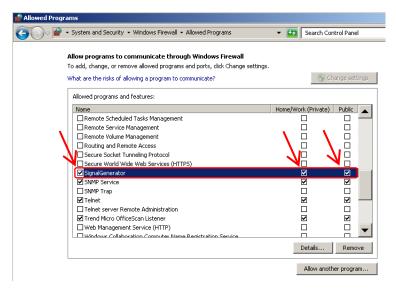


Figure 9.7.7.1-10 Allowed Programs Window

Chapter 9 Other Functions

When the OS is Win 10

Windows firewall On/Off setting (Win 10)

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- Move the mouse pointer to the bottom of the screen to display the Windows task bar. Click the Start icon to open the Start menu, and then click Windows System > Control Panel in the W column of the app list displayed.
- Set "View by: Category" at the upper right of the Control Panel, click System and Security > Windows Defender Firewall to show Windows Defender Firewall window.

Note:

Windows firewall is on by factory default.

4. Click **Turn Windows Defender Firewall on or off** found in the left side of Windows Defender Firewall window.

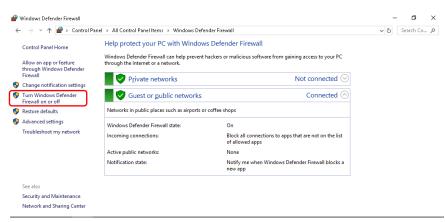


Figure 9.7.7.1-11 Windows Defender Firewall Window

5. Customize Settings window will be shown where Windows firewall On/Off settings can be changed.

Use the MG3710A/MG3710E/MG3740A with the following checkboxes Off (unchecked).

- Block all incoming connections, including those in the list of allowed apps
- Notify me when Windows Firewall blocks a new app

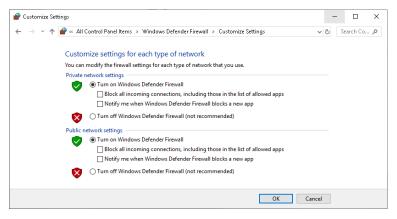


Figure 9.7.7.1-12 Customize Settings Window

<u>Confirmation and setting of allowed programs through Windows firewall (Win 10)</u> Even if Windows firewall is On, in order for the

MG3710A/MG3710E/MG3740A to operate properly, it is necessary to set as allowed programs those that enable external communication from the MG3710A/MG3710E/MG3740A.

1. Use the mouse to click Allow an app or feature through Windows Defender Firewall found in left side of Windows Defender Firewall window.

$ ightarrow ~ \uparrow internation entrol Pa$	nel > All Control Panel Items > Windows Defen	ler Firewall	~ 0	Search Co	,P
Control Panel Home	Help protect your PC with Windows	Defender Firewall			
Allow an app or feature through Windows Defender	Windows Defender Firewall can help prevent ha through the Internet or a network.	ckers or malicious software from gaining access to your PC			
Firewall Change notification settings	Private networks	Not connected 📎			
Furn Windows Defender Firewall on or off	Guest or public networks	Connected 🔗			
Restore defaults	Networks in public places such as airports or o	offee shops			
Advanced settings	Windows Defender Firewall state:	On			
roubleshoot my network	Incoming connections:	Block all connections to apps that are not on the list of allowed apps			
	Active public networks:	None			
	Notification state:	Notify me when Windows Defender Firewall blocks a new app			
See also					
Security and Maintenance					
Network and Sharing Center					

Figure 9.7.7.1-13 Windows Defender Firewall Window

2. Allowed apps window will be shown where programs allowed through Windows firewall can be confirmed.

Confirm if **MS269xAAppMgr** is found and set to On (checked) under **Allowed apps and features**.

When no such information is displayed, it is necessary to add **MS269xAAppMgr**.

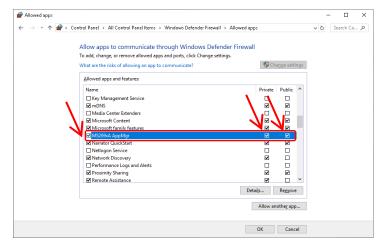


Figure 9.7.7.1-14 Allowed apps Window

Procedure to add **MS269xA AppMgr** when it is not registered (Win 10)

1. Use the mouse to click **Allow another app...** found in Allowed apps window.

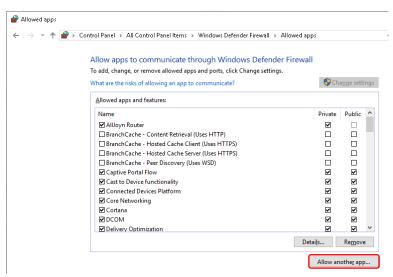


Figure 9.7.7.1-15 Allowed apps Window

2. Add an app window is shown. Click Browse....

Add an app	×
Select the app you want to add, or click Browse to find one that is not listed, and then click OK.	
Apps:	
Path: Browse	
What are the risks of unblocking an app?	
You can choose which network types to add this app to.	
Network types Add Canc	el

Figure 9.7.7.1-16 Add an app Window

 Browse window of Add an app is shown. Select C:\Anritsu\Signal Analyzer\Applications\AppMgr.exe, and click Open.

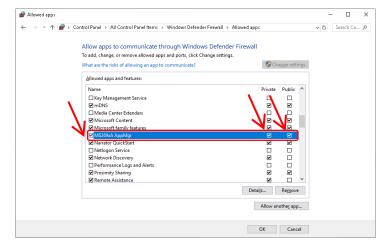
• -> • 🛧 📙 « I	.ocal Disk (C:) > Anritsu > Signal Analyzer	- > Applications > 🛛 🗸	🖸 🛛 Search Appl	ications ,	ρ
Organize 👻 New fol	der			H 🕶 🔲 (?
MS269xA	Name	Date modified 4/18/2019 9:23 AIVI	Type Hile Tolaer	Size	
network	W-CDMA BS Common	4/18/2019 9:23 AM 4/18/2019 9:23 AM	File folder File folder		
💻 This PC	WCDMA Uplink Common	4/18/2019 9:23 AM	File folder		
3D Objects	WLAN Common	4/18/2019 9:23 AM 4/18/2019 9:23 AM	File folder File folder		
E Desktop	AppMgr.exe	2/12/2019 10:47 PM	Application	1,268 KB	
Downloads	Base5G.exe BasebandInterface.exe	2/12/2019 11:18 PM 7/17/2014 1:00 PM	Application Application	24 KB 24 KB	
Music	BerTester.exe	2/12/2019 10:56 PM	Application	32 KB	
E Pictures	BootLoaderService.exe CDMA2000 Forwardlink.exe	10/21/2014 7:57 PM 2/12/2019 11:02 PM	Application Application	60 KB 24 KB	
🚛 Local Disk (C:) 🗸	DSRC.exe	2/12/2019 10:58 PM	Application	24 KB	
File	name: AppMgr.exe		 Application 	is (*.exe;*.com;*.icd)	~

Figure 9.7.7.1-17 Browse Window of Add an app

4. In Add an app window select MS269xA AppMgr, and click Add.

Add an app	\times
Select the app you want to add, or click Browse to find one that is not listed, and then click OK.	
Apps:	
MS269xA AppMgr	
Path: C:\Anritsu\Signal Analyzer\Applications\AppM Browse.	
What are the risks of unblocking an app?	
You can choose which network types to add this app to.	
Network types Add Cance	el 🛛

Figure 9.7.7.1-18 Add an app Window



5. MS269xAAppMgr is added to Allowed apps and features. Confirm if MS269xAAppMgr is found and set to On (checked).

Figure 9.7.7.1-19 Allowed apps Window

9.7.7.2 Installing Windows Important Update Programs (Windows Update)

It is necessary to regularly check for important Windows update programs and keep them up-to-date. However, since executing update program downloads and installations will decrease the performance of this equipment, deactivate automatic updates for Windows Update. Instead, it is recommended to check for new updates, execute downloads and installations periodically when this equipment is not in use for measurement.

When the OS is WES 7

Windows Update setting and execution (WES 7):

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- 2. Move the mouse pointer to the bottom of the screen to display the Windows task bar. Click **Start > Control Panel**.
- Set "View by: Category" at the upper right of the Control Panel, click System and Security > Windows Update to show Windows Update window.
- 4. To deactivate automatic updates, click **Change settings** found in left side of Windows Update window.



Figure 9.7.7.2-1 Windows Update Window

5. Select Never check for updates (not recommended) in Important updates, then click **OK**.

Sector Sec. Spar Sec.	
🚱 🔍 🖉 🕨 Control Panel 🔸 System and Security 🔸 Windows Update 🔸 Change settings 🔹 👻 🍫	Search Con 🔎
Choose how Windows can install updates When your computer is online, Windows can automatically check for important updates and install them using these settings. When new updates are available, you can also install them before shutting down the computer. How does automatic updating help me? Important updates Never check for updates (not recommended) Deveload updates to ult ure choose whether to install them Check for updates but let me choose whether to download and install them Check for updates to ult ure choose whether to download and install them Recommended updates to to recommended) I give me gecommended updates the same way I receive important updates Who can install updates Who can install updates in install updates on this computer Note: Windows Update might update itself automatically first when checking for other updates. Read our privacy statement online.	
OK Cancel	

Figure 9.7.7.2-2 Change settings Window

6. To check for newly available update programs (manual update), click **Check for updates** in Windows Update window.



Figure 9.7.7.2-3 Windows Update Window (manual update)

7. When a new update program is found, download and install following the displayed instructions.

Chapter 9 Other Functions

When the OS is Win 10

Windows Update setting and execution (Win 10)

- 1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the Windows desktop.
- 2. Move the mouse pointer to the bottom of the screen to display the Windows task bar. Click the **Start** icon to open the Start menu, and then click **Settings** icon.
- 3. Click Update and Security to show Windows Update window.
- 4. To turn off automatic updates, select **Windows Update** found in left side of Windows Update window, and then click **Advanced options**.

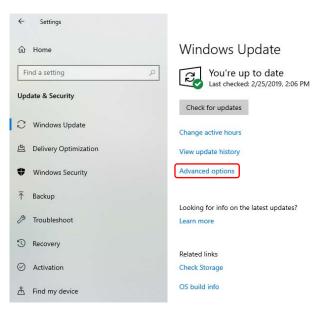


Figure 9.7.7.2-4 Windows Update Window

5. Advanced options window will be shown.

Confirm if Automatically download updates, even over metered data connections (charges may apply) is set to Off.

← Settings	-	٥	×
Update options			^
Give me updates for other Microsoft products when I update Windows.			
Automatically download updates. even over metered data connections (charges may apply) Off			1
Update notifications			
Show a notification when your PC requires a restart to finish updating			
Off			
Pause updates			
Temporarily pause updates from being installed on this device for up to 35 days. When updates resume, this device will need to get the la it can be paused again.	test updat	tes befor	re
Off Off			
Pausing now will pause updates until 6/11/2019.			

Figure 9.7.7.2-5 Advanced options Window

6. To check for newly available update programs (manual update), click **Check for updates** in Windows Update window.

← Settings	
命 Home	Windows Update
Find a setting	P You're up to date Last checked: 2/25/2019, 2:06 PM
Update & Security	Check for updates
C Windows Update	Change active hours
凸 Delivery Optimization	View update history
Windows Security	Advanced options
T Backup	
P Troubleshoot	Looking for info on the latest updates?
S Recovery	Disciple.
 Activation 	Related links Check Storage
Å Find my device	OS build info

Figure 9.7.7.2-6 Windows Update Window (manual update)

7. When a new update program is found, download and install following the displayed instructions.

9.7.7.3 Using Antivirus Software

It is recommended to install antivirus software on this equipment. However, since the automatic updates for virus data library and the full scans run in the background by the antivirus software will decrease the performance of this equipment, do not execute them. Instead, it is recommended to run them periodically when this equipment is not in use for measurement.

The antivirus software that checked operation in this equipment is shown below.

• Trend Micro OfficeScan XG

Note:

Refer to the antivirus software operation manual for its installation and operation procedures. It is confirmed that no negative effects in the general usage of this equipment are caused by using the software mentioned above, however, we do not guarantee the behavior of all functions of this antivirus software and other software containing similar functions.

Chapter 10 Performance Test

This chapter describes measurement devices, setup methods, configuration procedures, and performance test procedures required for performing performance tests as preventive maintenance.

10.1	Overview of Performance Test 10-2
	10.1.1 Performance test 10-2
	10.1.2 MG3710A/MG3710E/MG3740A performance
	test items and instruments used 10-3
10.2	Frequency Performance Test 10-4
	10.2.1 Frequency 10-4
10.3	Output Level Performance Test 10-7
	10.3.1 Output level frequency characteristics 10-7
10.4	Vector Modulation Performance Test 10-11
	10.4.1 Vector accuracy 10-11

10.1 Overview of Performance Test

10.1.1 Performance test

Performance tests are performed as preventive maintenance in order to prevent degradation of the performance. Perform the tests when required for acceptance inspection, routine inspection, and performance verification after repairs.

If the tests results do not meet the specifications, failures are considered. Contact an Anritsu Service and Sales office.

When the performance tests are performed, warm up the MG3710A/MG3710E/MG3740A and devices to be used with the tests for 30 minutes or more to stabilize them sufficiently. Also maximum measurement accuracy requires conducting performance tests under ambient temperatures and with little AC power supply voltage fluctuations (100 to 120 VAC, 200 to 240 VAC), as well as the absence of noise, vibrations, dust, humidity, and other problems.

10.1.2 MG3710A/MG3710E/MG3740A performance test items and instruments used

The MG3710A/MG3710E/MG3740A performance test items and instruments to be used for each item are described in Table 10.1.2-1.

ltem		Summary	Main Instrument (Anritsu Model Name)	
Frequency	Frequency	The frequency is set and the output frequency is measured.	Counter (MF2412C)	
Output level	Output level frequency characteristics	The absolute accuracy (frequency characteristics) is measured by using a power meter.	Power Meter (ML2437A) Power Sensor (MA24002A)	
Vector modulation	Vector accuracy	A modulated pattern signal is generated through internal modulation and the vector accuracy is measured by using a Signal Analyzer.	Signal Analyzer (MS2690A/91A/92A) W-CDMA/HSPA Downlink Measurement Software (MX269011A) GSM/EDGE Measurement Software (MX269013A) LTE Downlink Measurement Software (MX269020A)	

Table 10.1.2-1 Performance Test Items and Instruments Used

For items judged as important, perform the performance tests regularly as the preventive maintenance. It is recommended that those tests are performed around once or twice a year.

10.2 Frequency Performance Test

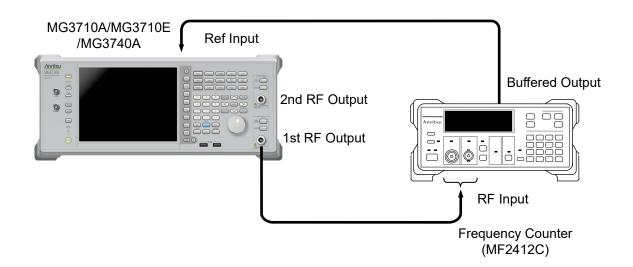
10.2.1 Frequency

Set the frequency of the MG3710A/MG3710E/MG3740A within 9 kHz to upper limit frequency and measure the frequency with the frequency counter (MF2412C) to confirm the set frequency is correctly output.

Test standards Frequency range

9 kHz to 2700 MHz
(when MG3710A/MG3710E/MG3740A-032/062/162 is installed)
9 kHz to 4000 MHz
(when MG3710A/MG3710E/MG3740A-034/064/164 is installed)
9 kHz to 6000 MHz
(when MG3710A/MG3710E/MG3740A-036/066/166 is installed)

Resolution 0.01 Hz



Test procedure

Set the frequency within 9 kHz to upper limit frequency of the MG3710A/MG3710E/MG3740A.

- 1. Connect the reference signal output (10 MHz) of the frequency counter to the external reference input (REF Input) of the MG3710A/MG3710E/MG3740A for frequency synchronization.
- 2. Press \bigcap^{Preset} to preset the MG3710A/MG3710E/MG3740A.

- 3. Set the output level of the MG3710A/MG3710E/MG3740A to 0 dBm and turn On the 1st RF Output.
- 4. Set the output frequency of the MG3710A/MG3710E/MG3740A to the value [FR (x)] in Table 10.2.1-1.
- 4.1 When x = 1

Connect RF Output of this equipment to Input2 of the frequency counter.

Select Input2 at Input >F1 Input CH.

Select 1 M Ω at Input >F2 Impd2.

Set the measurement resolution of the frequency counter to 100 Hz.

4.2 When x = 2, 3, 4

Connect RF Output of this equipment to Input2 of the frequency counter.

Select Input2 at Input >F1 Input CH.

Select 50 Ω at lnput >F2 Impd2.

Set the measurement resolution of the frequency counter to 1 MHz.

4.3 When x = 5 to 16

Connect RF Output of this equipment to Input1 of the frequency counter.

Select Input1 at Input >F1 Input CH.

Set the measurement resolution of the frequency counter to 1 MHz.

- 5. Check whether the frequency set to the MG3710A/MG3710E/MG3740A is equal to the frequency displayed on the frequency counter.
- 6. Change the frequency [FR (x)] according to Table 10.2.1-1 to repeat the measurement.
- 7. If the 2nd RF is installed, change the connection to the 2nd RF Output to perform Step 3 to 6.

Chapter 10 Performance Test

10.2.1-1	Frequency Setting I
x	FR (x) (MHz)
1	0.009
2	100
3	300
4	600
5	1000
6	1500
7	2000
8	2500
9	2700
10	3000
11	3500
12	4000
13	4500
14	5000
15	5500
16	6000

Table 10.2.1-1	Frequency	Setting	Table
----------------	-----------	----------------	-------

 $X \ge 10$ are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed. $X \ge 13$ are available only when the Upper limit frequency 6 GHz option is installed.

10.3 Output Level Performance Test

10.3.1 Output level frequency characteristics

Measure the level of each frequency of the MG3710A/MG3710E/MG3740A for the reference level with the power meter (Anritsu ML2437A) and power sensor (MA24002A).

Test standards

Absolute accuracy (18 to 28°C in CW mode)

		Frequency				
Composition	Output Level	50 MHz≤ , <400 MHz	400 MHz≤ , ≤3 GHz	3 GHz< , ≤4 GHz	4 GHz< , ≤5 GHz	5 GHz< , ≤6 GHz
$1 { m st RF}$	−40 dBm<, <+2 dBm	$\pm 0.5 \text{ dB}$	±0.5 dB	±0.7 dB	±0.8 dB	±0.8 dB
2nd RF	-40 dBm<, <+2 dBm	$\pm 0.5 \text{ dB}$	±0.5 dB	±0.7 dB	±0.8 dB	±0.8 dB

Table 10.3.1-1 Test Standards

For the 1st RF, when Option-043/143 is not installed.

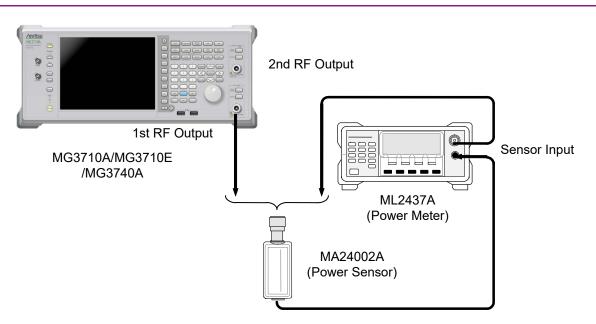
For the 2nd RF, when Option-073/173 is not installed.

		Frequency				
Composition	Output Level	50 MHz≤ , <400 MHz	400 MHz≤ , ≤3 GHz	3 GHz< , ≤4 GHz	4 GHz< , ≤5 GHz	5 GHz< , ≤6 GHz
$1 { m st RF}$	−40 dBm<, <−1 dBm	$\pm 0.5 \text{ dB}$	$\pm 0.5 \text{ dB}$	±0.7 dB	±0.8 dB	±0.8 dB
2nd RF	−40 dBm<, <−1 dBm	$\pm 0.5~\mathrm{dB}$	$\pm 0.5 \text{ dB}$	±0.7 dB	±0.8 dB	±0.8 dB

For the 1st RF, when $\mbox{Option-}043/143$ is installed.

For the 2nd RF, when Option-073/173 is installed.





Measure the level according to Table 10.3.1-2 or Table 10.3.1-3.

Test procedure

- 1. Press on the MG3710A/MG3710E/MG3740A and ML2437A to preset them.
- 2. Connect the MA24002A to the Cal Output connector of the ML2437A.
- 3. Calibrate the ML2437A.
- 4. Set Average Mode of the ML2437A to "Moving".
- 5. Set Average Count of the ML2437A to "10".
- 6. Connect the MA24002A to the RF Output connector of the MG3710A/MG3710E/MG3740A.
- 7. Perform the sensor calibration (zero point and sensitivity) for the ML2437A.
- 8. Turn On the 1st RF Output of the MG3710A/MG3710E/MG3740A.
- 9. Set the output level of the MG3710A/MG3710E/MG3740A to the value [LEV (1)] in Table 10.3.1-2 or Table 10.3.1-3.
- 10. Set frequencies of the MG3710A/MG3710E/MG3740A and ML2437A to the value [FR (1)] in Table 10.3.1-2 or Table 10.3.1-3.
- 11. Measure the level with the ML2437A.
- 12. Change the output level [LEV (x)] and frequency [FR (x)] according to Table 10.3.1-2 or Table 10.3.1-3 to repeat Step 9 to 11 to obtain measured values.
- 13. If the 2nd RF is installed, change the connection of the MA24002A to the 2nd RF Output to perform Step 7 to 12.

10.3 Output Level Performance Test

x	FR (x) (MHz)	LEV (x) (dBm)
1	50	-5
2	97	-5
3	98	-7
4	100	-7
5	399	-7
6	400	-7
7	500	-7
8	1000	-7
9	1500	-7
10	2000	-7
11	2500	-7
12	2700	-7
13	3000	-7
14	3001	-7
15	3500	-7
16	4000	-7
17	4001	-7
18	4500	-7
19	5000	-7
20	5001	-7
21	5500	-7
22	6000	-7

 Table 10.3.1-2
 Absolute Accuracy Measurement Frequency Setting

 Table 1

 $X \ge 13$ are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed. $X \ge 17$ are available only when the Upper limit frequency 6 GHz option is installed.

For the 1st RF, when Option-043/143 is not installed. For the 2nd RF, when Option-073/173 is not installed.

Chapter 10 Performance Test

	Table	-
x	FR (x) (MHz)	LEV (x) (dBm)
1	50	-5
2	97	-5
3	98	-10
4	100	-10
5	399	-10
6	400	-10
7	500	-10
8	1000	-10
9	1500	-10
10	2000	-10
11	2500	-10
12	2700	-10
13	3000	-10
14	3001	-10
15	3500	-10
16	4000	-10
17	4001	-10
18	4500	-10
19	5000	-10
20	5001	-10
21	5500	-10
22	6000	-10

Table 10.3.1-3 Absolute Accuracy Measurement Frequency Setting Table 2

> $X \ge 13$ are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed. $X \ge 17$ are available only when the Upper limit frequency 6 GHz option is installed. For the 1st RF, when Option-043/143 is installed. For the 2nd RF, when Option-073/173 is installed.

10.4 Vector Modulation Performance Test

10.4.1 Vector accuracy

The baseband signal is generated with the internal waveform pattern, and the vector modulation is performed with the MG3710A/MG3710E (hereafter referred to as "MG3710A/10E"). The vector error in the modulated RF signal is measured by using a signal analyzer (MS2690A/91A/92A) in which signal analysis software has been installed.

The vector modulation performance test is unnecessary because waveform patterns are not stored in the MG3740A.

Test standards

When MG3710A/10E-043/143/073/173 is not installed

W-CDMA (Test Model 4)

Output level \leq +7 dBm (When MG3710A/10E-041/141/071/171 is not installed),

Output level \leq +13 dBm (When MG3710A/10E-041/141/071/171 is installed),

Output frequency: $800 \mbox{ to } 900 \mbox{ MHz}, 1800 \mbox{ to } 2200 \mbox{ MHz},$

After CAL execution at 18 to 28° C

 $\leq 0.62\%$ (rms) (0.6% (rms) typ.)

GSM

Output level \leq +7 dBm (When MG3710A/10E-041/141/071/171 is not installed),

Output level \leq +13 dBm (When MG3710A/10E-041/141/071/171 is installed),

Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,

After CAL execution at 18 to 28°C

 $\leq 0.84^{\circ} \text{ (rms)} (0.8^{\circ} \text{ (rms) typ.})$

EDGE

Output level \leq +7 dBm (When MG3710A/10E-041/141/071/171 is not installed), Output level \leq +13 dBm (When MG3710A/10E-041/141/071/171 is installed),

Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,

After CAL execution at 18 to $28^{\circ}\mathrm{C}$

 $\leq 0.84\%$ (rms) (0.8% (rms) typ.)

LTE (20 MHz Test Model 3.1)
Output level \leq +7 dBm (When MG3710A/10E-041/141/071/171 is
not installed),
Output level \leq +13 dBm (When MG3710A/10E-041/141/071/171 is
installed),
Output frequency 600 to 2700 MHz,
After CAL execution at 18 to 28°C
\leq 0.82% (rms) (0.8% (rms) typ.)
Output level \leq +4 dBm (When MG3710A/10E-041/141/071/171 is
not installed),
Output level \leq +10 dBm (When MG3710A/10E-041/141/071/171 is installed),
Output frequency 3400 to 3800 MHz,
After CAL execution at 18 to 28°C
$\leq 0.82\%$ (rms) (0.8% (rms) typ.)
When MG3710A/10E-043/143/073/173 is installed
W-CDMA (Test Model 4)
Output level \leq +4 dBm (When MG3710A/10E-041/141/071/171 is not installed),
Output level \leq +10 dBm (When MG3710A/10E-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 2200 MHz,
After CAL execution at 18 to 28°C
$\leq 0.62\%$ (rms) (0.6% (rms) typ.)
GSM
Output level \leq +4 dBm (When MG3710A/10E-041/141/071/171 is
not installed),
Output level ≤ +10 dBm (When MG3710A/10E-041/141/071/171 is
installed),
Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,
After CAL execution at 18 to 28°C
$\leq 0.84^{\circ} \text{ (rms)} (0.8^{\circ} \text{ (rms) typ.})$
EDGE

Output level \leq +4 dBm (When MG3710A/10E-041/141/071/171 is not installed), Output level \leq +10 dBm (When MG3710A/10E-041/141/071/171 is installed), Output frequency: 800 to 900 MHz, 1800 to 1900 MHz, After CAL execution at 18 to 28°C \leq 0.84% (rms) (0.8% (rms) typ.) LTE (20 MHz Test Model 3.1)

Output level \leq +4 dBm (When MG3710A/10E-041/141/071/171 is not installed),

Output level \leq +10 dBm (When MG3710A/10E-041/141/071/171 is installed),

Output frequency 600 to 2700 MHz,

After CAL execution at 18 to 28°C

 $\leq 0.82\%$ (rms) (0.8% (rms) typ.)

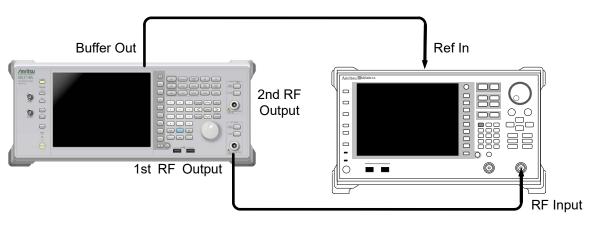
Output level \leq +1 dBm (When MG3710A/10E-041/141/071/171 is not installed),

Output level \leq +7 dBm (When MG3710A/10E-041/141/071/171 is installed),

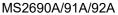
Output frequency 3400 to 3800 MHz,

After CAL execution at 18 to 28° C

 $\leq 0.82\%$ (rms) (0.8% (rms) typ.)



MG3710A/MG3710E



Test procedure W-CDMA (Test Model 4)

- 1. Press of the MG3710A/MG3710E and MS2690A/91A/92A to preset them.
- 2. Load the W-CDMA/HSPA Downlink Measurement Software (MX269011A) to the MS2690A/91A/92A.
- 3. Perform Band Cal. for the MS2690A/91A/92A.
- 4. Set the MS2690A/91A/92A as follows:
 - Chanel Detection : Test Model 4
 - Origin Ofst. : Incl.
 - ScramblingCode Synchronization : User Defined
 - Storage Mode : Average & Max

- Average count : 10
- 5. Turn On the RF Output of the MG3710A/MG3710E.
- 6. Turn On the vector modulation of the MG3710A/MG3710E to apply modulation with the TestModel_4 of standard waveform pattern.
- 7. Set the output level of the MG3710A/MG3710E and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
- 8. Set frequencies of the MG3710A/MG3710E and MS2690A/91A/92A to the value [FR (1)] in Table 10.4.1-2.
- 9. Set the Cal Type of IQ Cal. of the MG3710A/MG3710E to DC to perform Cal.
- 10. Measure EVM (rms) (the maximum value for Storage Count) with the MS2690A/91A/92A.
- 11. Change the output level and frequency [FR (x)] according to Table 10.4.1-1 and 10.4.1-2 to repeat Step 7 to 10 to obtain measured values.
- 12. If the 2nd RF is installed, change the connection of the MS2690A/91A/92A to the 2nd RF Output to perform Step 5 to 11.

Test procedure GSM

- 1. Press of the MG3710A/MG3710E and MS2690A/91A/92A to preset them.
- 2. Load the GSM/EDGE Measurement Software (MX269013A) to the MS2690A/91A/92A.
- 3. Perform Band Cal. for the MS2690A/91A/92A.
- 4. Set the MS2690A/91A/92A as follows:
 - RF Signal : Normal Burst
 - Modulation : GMSK.
 - Storage Mode : Average & Max
 - Average count : 10
- 5. Turn On the RF Output of the MG3710A/MG3710E.
- 6. Turn On the vector modulation of the MG3710A/MG3710E to apply modulation with the NB_GMSK of standard waveform pattern.
- 7. Set the output level of the MG3710A/MG3710E and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
- 8. Set frequencies of the MG3710A/MG3710E and MS2690A/91A/92A to the value [FR (1)] in Table 10.4.1-3.
- 9. Set the Cal Type of IQ Cal. of the MG3710A/MG3710E to DC to perform Cal.
- 10. Measure Phase Error (rms) (the maximum value for Storage Count) with the MS2690A/91A/92A.
- 11. Change the output level and frequency [FR (x)] according to Table 10.4.1-1 and 10.4.1-3 to repeat Step 7 to 10 to obtain measured values.
- 12. If the 2nd RF is installed, change the connection of the MS2690A/91A/92A to the 2nd RF Output to perform Step 5 to 11.

Test procedure (EGDE)

- 1. Press of the MG3710A/MG3710E and MS2690A/91A/92A to preset them.
- 2. Load the GSM/EDGE Measurement Software (MX269013A) to the MS2690A/91A/92A.
- 3. Perform Band Cal. for the MS2690A/91A/92A.
- 4. Set the MS2690A/91A/92A as follows:
 - RF Signal : Normal Burst
 - \bullet Modulation : 8PSK
 - Storage Mode : Average & Max
 - Average count : 10
- 5. Turn On the RF Output of the MG3710A/MG3710E.
- 6. Turn On the vector modulation of the MG3710A/MG3710E to apply modulation with the NB_8PSK of standard waveform pattern.
- 7. Set the output level of the MG3710A/MG3710E and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
- 8. Set frequencies of the MG3710A/MG3710E and MS2690A/91A/92A to the value [FR (1)] in Table 10.4.1-4.
- 9. Set the Cal Type of IQ Cal. of the MG3710A/MG3710E to DC to perform Cal.
- 10. Measure EVM (rms) (the maximum value for Storage Count) with the MS2690A/91A/92A.
- 11. Change the output level and frequency [FR (x)] according to Table 10.4.1-1 and 10.4.1-4 to repeat Step 7 to 10 to obtain measured values.
- 12. If the 2nd RF is installed, change the connection of the MS2690A/91A/92A to the 2nd RF Output to perform Step 5 to 11.

Test procedure LTE (20 MHz Test Model 3.1)

- 1. Press \bigcirc of the MG3710A/MG3710E and MS2690A/91A/92A to preset them.
- 2. Load the LTE Downlink Measurement Software (MX269020A) to the MS2690A/91A/92A.
- 3. Perform Band Cal. for the MS2690A/91A/92A.
- 4. Set the MS2690A/91A/92A as follows:
 - Channel Bandwidth : 20 MHz
 - Test Model: E-TM3.1
 - Analysis Time : 10 Subframe
 - Storage Mode : Average & Max
 - EVM Window Length : W, 136
 - Average count : 10
- 5. Turn On the RF Output of the MG3710A/MG3710E.
- 6. Turn On the vector modulation of the MG3710A/MG3710E to apply modulation with the E-TM_3-1_20M of standard waveform pattern.
- 7. Set the output level of the MG3710A/MG3710E and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.

- 8. Set frequencies of the MG3710A/MG3710E and MS2690A/91A/92A to the value [FR (1)] in Table 10.4.1-5.
- 9. Set the Cal Type of IQ Cal. of the MG3710A/MG3710E to DC to perform Cal.
- 10. Measure EVM (rms) (the maximum value for Storage Count) with the MS2690A/91A/92A.
- 11. Change the output level and frequency [FR (x)] according to Table 10.4.1-1 and 10.4.1-5 to repeat Step 7 to 10 to obtain measured values.
- 12. If the 2nd RF is installed, change the connection of the MS2690A/91A/92A to the 2nd RF Output to perform Step 5 to 11.

10.4 Vector Modulation Performance Test

	For the 1st RF, when Option-043/143 is not installed	For the 1st RF, when Option-043/143 is installed	
Composition	For the 2nd RF, when Option-073/173 is not installed	For the 2nd RF, when Option-073/173 is installed	
For the 1st	W-CDMA: +7 dBm	W-CDMA: +4 dBm	
RF, when	GSM:+7 dBm	GSM:+4 dBm	
Option-041/14 1 is not	EDGE:+7 dBm	EDGE:+4 dBm	
installed	LTE:+7 dBm	LTE:+4 dBm	
For the 2nd	(600 to 2700 MHz)	(600 to 2700 MHz)	
RF, when	LTE:+4 dBm	LTE:+1 dBm	
Option-071/171 is not installed	(3400 to 3800 MHz)	(3400 to 3800 MHz)	
For the 1st	W-CDMA: +13 dBm	W-CDMA: +10 dBm	
RF, when	GSM:+13 dBm	GSM:+10 dBm	
Option-041/14 1 is installed	EDGE:+13 dBm	EDGE:+10 dBm	
For the 2nd	LTE:+13 dBm	LTE:+10 dBm	
RF, when	(600 to 2700 MHz)	(600 to 2700 MHz)	
Option-071/171	LTE:+10 dBm	LTE:+7 dBm	
is installed	(3400 to 3800 MHz)	(3400 to 3800 MHz)	

Table 10.4.1-1 Modulation Accuracy Measurement Level

Table 10.4.1-2	W-CDMA Test Model 4 Modulation Accuracy
	Measurement Frequency Table

x	FR (x) (MHz)
1	800
2	900
3	1800
4	2000
5	2200

Chapter 10 Performance Test

Table 10.4.1-3 GSM Modulation Accuracy Measurement Frequency Table

x	FR (x) (MHz)
1	800
2	900
3	1800
4	1900

Table 10.4.1-4 EDGE Modulation Accuracy Measurement Frequency

Table

x	FR (x) (MHz)
1	800
2	900
3	1800
4	1900

Table 10.4.1-5	LTE (20 MHz Test Model 3.1) Modulation Accuracy	
	Measurement Frequency Table	

х	FR (x) (MHz)
1	600
2	800
3	1500
4	2000
5	2400
6	2700
7	3400
8	3500
9	3600
10	3700
11	3800

Chapter 11 Maintenance

This chapter describes cautions related to daily maintenance, storage, and shipping of the MG3710A/MG3710E/MG3740A, as well as the calibration procedure to be used as preventive maintenance.

11.1	Daily Maintenance and Storage11-
	11.1.1 Daily maintenance 11-2
	11.1.2 Cautions before long-term storage 11-2
	11.1.3 How to store USB memory 11-
11.2	Repacking and Transportation upon Return
	11.2.1 Repacking 11-4
	11.2.2 Transportation11-
11.3	Disposal
11.3 11.4	Disposal
	•
	Calibration11-
	Calibration
11.4	Calibration

11.1 Daily Maintenance and Storage

11.1.1 Daily maintenance

Before maintenance, be sure to turn the power off and unplug it from the AC outlet.

Panel surface dirt

When the panel surface dirt is noticeable, or when the MG3710A/MG3710E/MG3740A has been used in a dusty place, or before long-term storage, wipe the MG3710A/MG3710E/MG3740A with a cloth soaked in soapy water and wrung dry.

Screen surface dirt

If the screen surface is dirty, first wipe it dry with a soft cloth. When the dirt is terrible, wipe it lightly with a cloth soaked in soapy water and wrung dry.

Loose screws

Use a Phillips screwdriver to tighten screws.

11.1.2 Cautions before long-term storage

Before storage, wipe off dust, grime, other dirt, or stains attached to the MG3710A/MG3710E/MG3740A. Put the power cable, DVD-R and other accessories in the accessory box and store with the MG3710A/MG3710E/MG3740A. Also, avoid storage in the following places.

- In direct sunlight for extended periods
- Outdoors
- In excessively dusty locations
- Where condensation may occur
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in place chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen oxide, or hydrogen chloride etc.) are present
- Where toppling over may occur
- In the presence of lubricating oil mists
- At low atmospheric pressure
- In the presence of frequent vibration or mechanical shock, such as in cars, ships, or airplanes
- Where temperature range and relative humidity exceed -20 to 60° C and 90%, respectively

Recommended storage conditions

For long-term storage, it is recommended that the MG3710A/MG3710E/MG3740A is stored within the ranges of the environmental conditions below along with that the conditions for cautions before storage above are met.

- Temperature The range of 0 to 45°C
- Humidity The range of 40 to 80%
- A place with small change of temperature and humidity during a day

11.1.3 How to store USB memory

Store a USB memory in a place with temperature 4 to 53°C and humidity of 8 to 90% (no condensation). Also, avoid storing it in places below:

- Dusty and humid places
- Places near magnetized items
- Places exposed to direct sunlight
- Places near thermal sources

11.2 Repacking and Transportation upon Return

Cautions needed on transportation of the MG3710A/MG3710E/MG3740A are explained.

11.2.1 Repacking

Repacking

Repack the MG3710A/MG3710E/MG3740A using the packing material (box) in which the MG3710A/MG3710E/MG3740A had been packed first. If the packing material has been discarded or damaged, repack the MG3710A/MG3710E/MG3740A with the method below:

- 1. Pack the MG3710A/MG3710E/MG3740A with vinyl or others.
- 2. Prepare a cardboard box, wooden box, or aluminum box which is large enough for the MG3710A/MG3710E/MG3740A and buffer material to surround the MG3710A/MG3710E/MG3740A to be put in the box.
- 3. Put the MG3710A/MG3710E/MG3740A in the box. Place the buffer material around the MG3710A/MG3710E/MG3740A not to move in the box.
- 4. Tie up the box with packing rope, adhesive tape, band, or others.

11.2.2 Transportation

It is recommended to transport the MG3710A/MG3710E/MG3740A after the recommended storage conditions are satisfied and avoiding vibration as much as possible.

11.3 Disposal

When the MG3710A/MG3710E/MG3740A is to be discarded, comply with regulations of each country and local government. Before discarding the MG3710A/MG3710E/MG3740A, dismantle or physically destroy any memory media it contains to ensure that any data saved in memory cannot be recovered by third parties.

11.4 Calibration

11.4.1 Calibration

Calibration is performed as preventive maintenance in order to prevent degradation of the performance. It should be performed regularly to maintain the performance of the MG3710A/MG3710E/MG3740A even if it operates normally.

It is desired that calibration is performed around once or twice a year. If the calibration result does not meet the specification, a failure is considered. Contact an Anritsu Service and Sales office.



When the calibration is performed, warm up the MG3710A/MG3710E/MG3740A and the device to be used with the calibration for 30 minutes or more to stabilize them sufficiently. Also maximum measurement accuracy requires conducting the calibration under the temperature of 23° C $\pm 5^{\circ}$ C and with little AC power supply voltage fluctuations (100 to 120 VAC, 200 to 240 VAC), as well as the absence of noise, vibrations, dust, humidity, and other problems.

11.4.2 Device to be used for calibration

Devices to be used for the calibration of the MG3710A/MG3710E/MG3740A are described in the table below.

Recommended Device	Required Performance	Calibration Item
Oscilloscope	1 GHz measurement available External trigger input supported	Reference oscillator frequency accuracy
Signal generator	1 GHz signal output available (Resolution: 0.01 Hz or more)	Reference oscillator frequency accuracy
Frequency standard device	Standard electrical wave receiver or device with equivalent function (Accuracy: 1×10^{-11} order or more)	Reference oscillator frequency accuracy

Table 11.4.2-1 Measuring Instrument for Calibration List

11.4.3 Calibrating frequency with oscilloscope

Calibrate the reference oscillator frequency using an oscilloscope. Use a frequency standard device (signal synchronized with a standard electric wave and rubidium atomic standard device) with accuracy sufficiently better than the reference oscillator.

Reference Oscillator	Aging Rate	Temperature Stability
Internal reference oscillator	$\pm 1 \times 10^{-6}$ /year	$\pm 2.5 \times 10^{-6} (5 \text{ to } 45^{\circ}\text{C})$
High stability reference oscillator (Option 002/102 installed)	$\pm 1 \times 10^{-7}$ /year	$\pm 2 \times 10^{-8} (5 \text{ to } 45^{\circ}\text{C})$
Rubidium reference oscillator (Option 001/101 installed)	$\pm 1 \times 10^{-10}$ /month	$\pm 2 \times 10^{-9}$ (5 to 45°C)

Table 11.4.3-1	Calibration	Standard

Calibration procedure

The frequency calibration procedure with an oscilloscope is described.

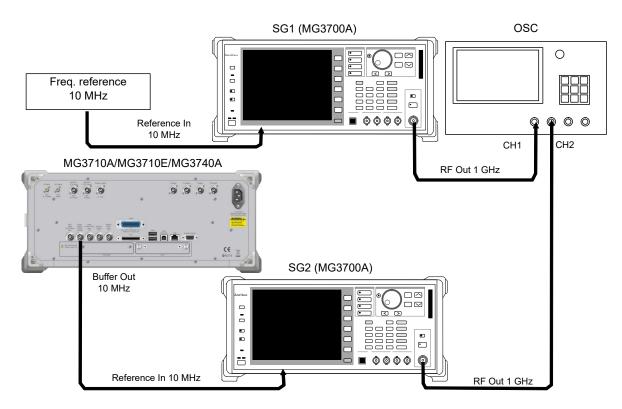


Figure 11.4.3-1 Frequency Calibration Connection with Oscilloscope

- 1. Connect the signal of 10 MHz output from the frequency standard device to the reference signal input connector (Reference In) of the signal generator 1.
- 2. Connect the reference signal output (Buffer Out) on the rear side of the MG3710A/MG3710E/MG3740A to the reference signal input connector (Reference In) of the signal generator 2.
- 3. Connect the RF output connector of the signal generator 1 to CH1 of the input connector of the oscilloscope and the RF output connector of the signal generator 2 to CH2 of the input connector of the oscilloscope.
- 4. Set the frequency of the signal generator 1 and 2 to 1 GHz and output the signal.
- 5. Adjust the oscilloscope to enable observation of the input waveform of each signal generator.

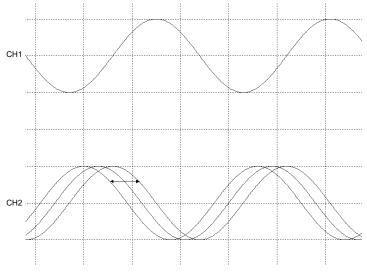


Figure 11.4.3-2 Oscilloscope Waveform Display

From the figure above, set the trigger to the signal waveform of CH1 which outputs the reference signal.

The stationary displayed waveforms of the signal generator 1 and 2 (CH1 and CH2) input to the oscilloscope indicate that the frequency of the reference oscillator of the MG3710A/MG3710E/MG3740A is synchronized with the standard frequency and has a normal value.

However, if the displayed waveforms move to the right or left without synchronization, the reference oscillator of the MG3710A/MG3710E/MG3740A must be adjusted.

- For synchronization, adjust the value of Reference Clock.
 For the adjustment method for Reference Clock, Refer to 4.6.6 "Ref Clock Adjustment".
- 7. When it is adjusted and the output frequency of the MG3710A/MG3710E/MG3740A meets the standard frequency, the displayed waveform of the oscilloscope rests.

Note:

In actuality, the complete correspondence between waveforms of the output frequency and the standard frequency is not possible. Make the adjustment for the phase fluctuation to be the minimum.

11.5 How to Replace Hard Disk

Use the following procedure to replace the internal hard disk (Main HDD) of the equipment with the exchange HDD (MG3710A/MG3740A-313). The reference waveforms have been written to the exchange HDD already at factory shipment. Waveform patterns saved by the customer after purchasing this equipment should be rewritten to the exchange HDD after replacing the Main HDD. (Be sure to backup important waveform patterns.)

A backup can be obtained by copying the User Data folder in the path C:\Anritsu\MG3710A.

If the internal HDD and secondary HDD are faulty, contact our service representative for factory repair.

Replacement procedure

* Turn off the power of the MG3710A/MG3740A and disconnect the power cable from the power outlet before replacement. Also, put the MG3710A/MG3740A on a flat horizontal bench top when working on it.

<Procedure>

- 1. Remove two screws for HDD ASSY replacement on the rear panel with a flat head screwdriver.
- 2. Pull out the current hard disk (HDD ASSY).
- 3. Insert the new hard disk (HDD ASSY).
- 4. Tighten up the two screws for HDD ASSY replacement on the rear panel with a flat head screwdriver.

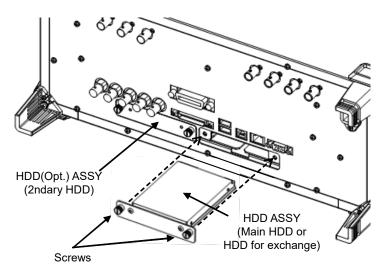


Figure 11.5-1 HDD ASSY Replacement

Note:

If the Hard Disk lamp on the front panel keeps lighting after HDD ASSY replacement, the HDD ASSY may not be inserted correctly. If so, turn off the power, disconnect the power cable from the power outlet, remove the HDD ASSY once, and insert it again.

11.6 Troubleshooting

This section explains possible causes and measures for them when the MG3710A/MG3710E/MG3740A does not operate correctly.

If any troubles are not described in this section or taking measures below does not improve the symptoms, contact an Anritsu Service and Sales office.

Problem	Possible Cause	Measure
Cannot be powered on.	The power cord is disconnected. The plug is not securely connected to the inlet.	Connect the power cord correctly.
	The power switch is not pressed securely.	Hold down the power switch for three seconds or more.
The initialization screen is not finished even when ten minutes or more have passed after the power on.		Turn off the power once, and turn on it again. If you have the same state after that, immediately turn off the power, and contact an Anritsu Service and Sales office.
Nothing is displayed on the screen.	The command to set the screen display to Off has been sent with the remote control.	Send the command to set the screen display to On.
Parameters cannot be set.	Knob Hold has been set.	Press on the screen to cancel Knob Hold.
	The remote control mode has been enabled.	Press $\overset{\text{Local}}{\longrightarrow}$ to switch to the local control mode.
	The parameter stands out of the specified range.	Set the parameter with the value within the specified range.
	The setting condition is not met.	Check the parameter setting condition.
The function menu cannot be found.	It is displayed on another menu page.	Press \bigcirc to switch the page.
	The displayed mode is different.	Switch to the mode which displays the menu to be set.
When the parameter is to be set, "Out of Range" is displayed.	The parameter stands out of the specified range.	Set the parameter with the value within the specified range.

Table 11.6-1 Troubleshooting

Problem	Possible Cause	Measure	
The remote control mode is not enabled with GPIB.	Remote control has been executed with Ethernet.	Disconnect Ethernet, press \bigcirc^{Local} to switch to the local control mode, and then execute the connection with GPIB again.	
	GPIB address is wrong.	Set the same GPIB address to the interface setup screen and the controller side.	
	The GPIB cable is not connected correctly.	Connect the cable correctly based on the GPIB network condition.	
	The GPIB board setup on the PC is not correct.	Refer to the GPIB board operation manual you use.	
The remote control mode is not enabled with Ethernet.	Remote control has been executed with GPIB.	Disconnect GIPB, press boost to switch to the local control mode, and then execute the connection with Ethernet again.	
	The port number is wrong.	Set the same port number to the interface setup screen and the PC.	
	The LAN cable type you use is wrong.	Select the cable correctly according to the connection method. Refer to "E.2.2 Connection by Ethernet".	
	The LAN cable is not connected correctly.	Connect the cable correctly based on the Ethernet network condition.	
	The LAN board setup on the PC is not correct.	Refer to the LAN board operation manual you use.	
The connection to IQproducer [™] by LAN is unavailable.	IP address is wrong.	Set the same IP address to the interface setup screen and the IQproducer TM side.	
	The User ID or password is wrong.	Set the same user ID/password to the interface setup screen and the IQproducer TM side.	
A waveform pattern is not displayed on the Waveform List to Play list in Baseband Mode.	The waveform pattern has not been loaded to the memory.	Load the waveform pattern to the memory. Refer to 7.3.4 "Loading waveform pattern: Load".	
A waveform pattern cannot be loaded to the memory.	The license key has not been installed.	Install the license key which corresponds to each pattern. Refer to 9.4.4 "Install".	
A signal is not output from the RF output.	The RF output is Off.	Press On/Off On . to switch the RF output to On.	
A modulated signal is not output from the RF output.	The modulation is Off.	Press Med to switch the RF output modulation to On.	

 Table 11.6-1
 Troubleshooting (Cont'd)

Chapter 11 Maintenance

Problem	Possible Cause	Measure
A modulated signal is not output from the I/Q output.	I/Q output is Off.	Press to enable the I/Q setting mode and switch the I/Q Output to "Analog I/Q Out". Refer to 7.6 "IQ Modulation".
The BER measurement does not operate normally.	The connected connector is wrong.	Connect to the correct connector according to the type of the signal to be input.
UNLOCK is displayed.	When Ref Source is Auto	Check if the reference signal input externally is correct.
	When Baseband Clock Source is Ext	Check if the Baseband Clock signal input externally is correct.
	Cases other than the above	The MG3710A/MG3710E/MG3740A may be broken. Contact an Anritsu Service and Sales office.
NG is displayed to [0] REF with Alarm History.	Failure in circuit	The MG3710A/MG3710E/MG3740A may be broken. Contact an Anritsu Service and Sales office.
ALC is displayed. NG is displayed to [2] ALC with Alarm History.	When using the MG3710A/MG3710E/MG3740 A beyond the range of the product specification (output level accuracy)	The output level may not have reached the specified value. Change the setting so that the specified output level accuracy can be obtained.
	When using the MG3710A/MG3710E/MG3740A within the range of the product specification (output level accuracy)	The MG3710A/MG3710E/MG3740A may be broken. Contact an Anritsu Service and Sales office.
NG is displayed to [3] BB with Alarm History.	Failure in circuit	The MG3710A/MG3710E/MG3740A may be broken. Contact an Anritsu Service and Sales office.
NG is displayed to [4] RPP with Alarm History.	High-level RF signal has been input to the RF Output terminal externally.	Check for the output level of connected devices, cable disconnection, short, and impedance inconsistency. Refer to 3.3.10 "RPP".
BBDAC is displayed.	Clipping by over flow has occurred with Baseband DAC or digital block.	Lower the RMS Value Tuning setting.
EXTMOD is displayed.	The level of signal input to the External Modulation Input connector is greater than 2.03 Vp-p.	Decrease the level of signal input to the External Modulation Input connector to 2 Vp-p or less.
	The level of signal input to the External Modulation Input connector is not greater than 2.03 Vp-p.	The MG3710A/MG3710E/MG3740A may be broken. Contact an Anritsu Service and Sales office.

Table 11.6-1	Troubleshooting (Cont'd)
--------------	--------------------------

A.1 Electrical Characteristics

Typ. value is not the guaranteed performance with this specification; it is for reference.

Nominal values are not guaranteed.

It is a common specification for MG3710A, MG3710E and MG3740A (hereafter "MG3710A/10E/40A"), if not specified.

<Conditions>

Unless otherwise noted,	function and performance are specified in the following conditions.		
Common to CW mode and modulation mode	Measurement at a constant ambient temperature, after a warm up of 30 minutes		
	Pulse modulation: Off		
	ATT Hold: Off		
	Optimize S/N Mode: Off		
	In the frequency range over 2.7 GHz, this condition is applied only when MG3710A/10E/40A-034/036 (or 064/066/164/166 for 2nd SG) is installed.		
	At frequencies over 4 GHz, this condition applies only when the MG3710A/10E/40A-036 (2nd SG is 066/166) is installed.		
Only in modulation mode	Assuming that the RMS value of the waveform pattern is RMSw [linear value], the following must be met:		
	$-3.00 \text{ dB} \le \text{RMSnom} \le +3.00 \text{ dB}$		
	Exceptions: RMSnom=20 · log (RMSw/4628) (when specified in 16 bit data)		
	RMSnom=20 · log (RMSw/2314) (when specified in 15 bit data)		
	RMSnom=20·log (RMSw/1157) (when specified in 14 bit data)		
	After CAL execution		
	All the above are also applied to 2nd SG (MG3710A/10E/40A-062/064/066/162/164/166).		

<Frequency>

Items	Specifications		
Range			
1st SG	9 kHz to 2.7 GHz (MG3710A/10E/40A-032)		
	9 kHz to 4 GHz (MG3710A/10E/40A-034)		
	9 kHz to 6 GHz (MG3710A/10E/40A-036)		
2nd SG	9 kHz to 2.7 GHz (MG3710A/10E/40A-062/162)		
	9 kHz to 4 GHz (MG3710A/10E/40A-064/164)		
	9 kHz to 6 GHz (MG3710A/10E/40A-066/166)		
Resolution	0.01 Hz		
Phase adjustment			
Setting range	-180.00 deg to 180.00 deg		
Resolution	0.01 deg		
Frequency switching time	Under the condition of frequency > 187.5 MHz, Phase Noise Optimize: Offset < 200 kHz, this is defined as the period from the detection of a List function execution trigger to the time when the frequency falls within ± 0.1 ppm or 100 Hz tolerance of the final target value. When MG3710A/10E/40A-041/141 or MG3710A/10E/40A-071/171 not installed and output level \leq +7 dBm: \leq 600 µs		
Internal reference oscillator			
oscillator	When MG3710A/10E/40A-001/101/002/102 is not installed:		
Aging rate	$\pm 1 \times 10^{-6}$ /year		
Temperature stability	$\pm 2.5 \times 10^{-6} (5 \text{ to } 45^{\circ}\text{C})$		
1	When MG3710A/10E/40A-001/101 is installed:		
Aging rate	$\pm 1 \times 10^{-10}$ /month		
Temperature stability	$\pm 2 \times 10^{-9} (5 \text{ to } 45^{\circ}\text{C})$		
Activation	Based on frequency 24 hours after power application, at 23°C		
characteristics	$\pm 1 \times 10^{-9}$ (7.5 minutes after power application)		
	When MG3710A/10E/40A-002/102 is installed:		
Aging rate	$\pm 1 \times 10^{-7}$ /year $\pm 2 \times 10^{-8}$ (5 to 45°C)		
Temperature stability Activation			
characteristics	Based on frequency 24 hours after power application, at 23°C $\pm 5 \times 10^{-7}$ (2 minutes after power application) $\pm 5 \times 10^{-8}$ (5 minutes after power application)		

<Output level>

Items	Specifications		
Setting range	1st SG: MG3710A/10E/40A-043/143 not installed, 2nd SG: MG3710A/10E/40A-073/173 not installed		
	1st SG: MG3710A/10E/40A-041/141 not installed, 042/142 not		
	installed,		
	2nd SG: MG3710A/10E/40A-071/171 not installed, 072/172 not installed		
	-110 dBm to +17 dBm		
	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 not installed -110 dBm to +30 dBm		
	1st SG: MG3710A/10E/40A-041/141 not installed, 042/142 installed, 2nd SG: MG3710A/10E/40A-071/171 not installed, 072/172 installed -144 dBm to +17 dBm		
	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 installed -144 dBm to +30 dBm		
	1st SG: MG3710A/10E/40A-043/143 installed, 2nd SG: MG3710A/10E/40A-073/173 installed		
	1st SG: MG3710A/10E/40A-041/141 not installed, 042/142 not installed,		
	2nd SG: MG3710A/10E/40A-071/171 not installed, 072/172 not installed		
	-110 dBm to +17 dBm 1st SG: MG3710A/10E/40A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 not installed -110 dBm to +25 dBm		
	1st SG: MG3710A/10E/40A-041/141 not installed, 042/142 installed, 2nd SG: MG3710A/10E/40A-071/171 not installed, 072/172 installed -144 dBm to +17 dBm		
	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 installed -144 dBm to +25 dBm		
Resolution	0.01 dB		
Unit Unit of electrical power	dBm		
Unit of voltage	dBµV (terminal voltage display) and dBµVemf (open voltage display)		
Level switching time	Under the condition of frequency > 187.5 MHz, within the specification range of output level accuracy.		
	However, output level \leq +7 dBm when MG3710A/10E/40A-041/141 or MG3710A/10E/40A-071/171 not installed:		
	This is defined as the period from the detection of a List function execution trigger to the time when the frequency falls within ± 0.2 dB tolerance of the final target value.		
	≤600 μs		

Items		Specifications		
Accuracy	CW, at 18 to 28°C			
	1st SG: MG3710A/10E/40A-043/143 not installed, 2nd SG: MG3710A/10E/40A-073/173 not installed			
	1st SG: MG3710A/10E/40A-041/141/042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171/072/172 not installed			
		Frequ	iency	
	Level		100 kHz≤, <1 MHz	
	–100 dBm<, <u>≤</u> +5 dBm		±0.5 dB typ.	
		Frequ	iency	
	Level	1 MHz≤, <10 MHz	10 MHz≤, <50 MHz	
	+5 dBm<, ≤+10 dBm		±0.7 dB typ.	
	–110 dBm<, ≤+5 dBm	±0.5 dB typ.	$\pm 0.5~\mathrm{dB}$ typ.	
	Level	Frequency		
		50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+1 dBm≤, ≤+13 dBm	±0.5 dB	±0.5 dB	
	_40 dBm<, <+1 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	–110 dBm<, ≤–40 dBm	±0.5 dB	±0.5 dB	
		Frequ	Frequency	
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤5 GHz	
	+11 dBm<, ≤+13 dBm	±0.7 dB	±0.8 dB	
	+1 dBm≤, ≤+11 dBm	±0.7 dB	±0.8 dB	
	_40 dBm<, <+1 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	_110 dBm<, ≤_100 dBm	±0.7 dB	±0.8 dB	
		Frequ	uency	
	Level	5 GHz<, ≤6 GHz		
	+1 dBm≤, ≤+11 dBm	±0.8 dB		
	_40 dBm <, <+1 dBm	±0.8 dB		
	_100 dBm<, ≤_40 dBm	±0.8 dB		
	_110 dBm<, ≤_100 dBm	±0.8 dB		

Items	Specifications			
Accuracy	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 not installed			
		Frequency		
	Level		100 kHz≤, <1 MHz	
	–100 dBm<, ≤+5 dBm		$\pm 0.5~\mathrm{dB}$ typ.	
		Frequ	ency	
	Level	1 MHz ≤, <10 MHz	10 MHz≤, <50 MHz	
	+5 dBm<, ≤+10 dBm		±0.7 dB typ.	
	–110 dBm<, ≤+5 dBm	±0.5 dB typ.	±0.5 dB typ.	
		Frequ	ency	
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+20 dBm<, ≤+23 dBm		±0.6 dB	
	+13 dBm<, ≤+20 dBm	±0.6 dB	±0.6 dB	
	+1 dBm≤, ≤+13 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	_40 dBm<, <+1 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	–110 dBm<, ≤–40 dBm	$\pm 0.5 \text{ dB}$	$\pm 0.5 \text{ dB}$	
	Frequency			
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤5 GHz	
	+13 dBm<, <+20 dBm	±0.7 dB		
	+11 dBm<, <=+13 dBm	±0.7 dB	±0.8 dB	
	+1 dBm≤, ≤+11 dBm	±0.7 dB	±0.8 dB	
	_40 dBm<, <+1 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.7 dB	±0.8 dB	
		Frequ	ency	
	Level	5 GHz<, ≤6 GHz		
	+1 dBm≤, ≤+11 dBm	±0.8 dB		
	_40 dBm<, <+1 dBm	±0.8 dB		
	–100 dBm<, ≤–40 dBm	±0.8 dB		
	–110 dBm<, ≤–100 dBm	±0.8 dB		

Items	Specifications			
Accuracy	1st SG: MG3710A/10E/40A-041/141 not installed, 042/142 installed, 2nd SG: MG3710A/10E/40A-071/171 not installed, 072/172 installed			
		Frequency		
	Level		100 kHz≤, <1 MHz	
	–100 dBm<, ≤+5 dBm		±0.5 dB typ.	
		Frequency		
	Level	1 MHz≤, <10 MHz	10 MHz≤, <50 MHz	
	+5 dBm<, ≤+10 dBm		±0.7 dB typ.	
		±0.5 dB typ.	$\pm 0.5 \text{ dB typ.}$	
		Frequ	iency	
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+1 dBm≤, ≤+13 dBm	±0.5 dB	±0.5 dB	
	_40 dBm<, <+1 dBm	±0.5 dB	±0.5 dB	
	–110 dBm<, ≤–40 dBm	±0.5 dB	±0.5 dB	
	–120 dBm<, ≤–110 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	–127 dBm<, ≤–120 dBm	±0.7 dB	±0.7 dB	
	–136 dBm<, ≤–127 dBm	±1.5 dB typ.	±1.5 dB typ.	
		Frequency		
	Level	3 GHz<, ≤4 GHz	 4 GHz<, ≤5 GHz	
	+11 dBm<, ≤+13 dBm	±0.7 dB	±0.8 dB	
	+1 dBm≤, ≤+11 dBm	±0.7 dB	±0.8 dB	
	_40 dBm<, <+1 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.7 dB	±0.8 dB	
	–120 dBm<, <u>≤</u> –110 dBm	±0.7 dB	±1.0 dB	
	_127 dBm<, ≤_120 dBm	±2.5 dB typ.	±2.5 dB typ.	
		Frequ	iency	
	Level	5 GHz<, ≤6 GHz		
	+1 dBm≤, ≤+11 dBm	±0.8 dB		
		±0.8 dB		
	_100 dBm<, ≤_40 dBm	±0.8 dB		
	110 dBm<, ≤–100 dBm	±0.8 dB		
		±1.0 dB		
		±2.5 dB typ.		

Items	Specifications			
Accuracy	1st SG: MG3710A/10E/40A-041/141/042/142 installed, 2nd SG: MG3710A/10E/40A-071/171/072/172 installed			
		Frequency		
	Level		100 kHz≤, <1 MHz	
	–100 dBm<, ≤+5 dBm		$\pm 0.5 \text{ dB typ.}$	
		Frequ	ency	
	Level	1 MHz≤, <10 MHz	10 MHz≤, <50 MHz	
	+5 dBm<, ≤+10 dBm		±0.7 dB typ.	
	–120 dBm<, ≤+5 dBm	±0.5 dB typ.	±0.5 dB typ.	
		Frequ	Frequency	
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+20 dBm<, ≤+23 dBm		±0.6 dB	
	+13 dBm<, ≤+20 dBm	±0.6 dB	±0.6 dB	
	+1 dBm≤, ≤+13 dBm	±0.5 dB	±0.5 dB	
	_40 dBm<, <+1 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	_110 dBm<, ≤_40 dBm	±0.5 dB	±0.5 dB	
	–120 dBm<, ≤–110 dBm	±0.5 dB	±0.5 dB	
	–127 dBm<, ≤–120 dBm	±0.7 dB	±0.7 dB	
	–136 dBm<, ≤–127 dBm	±1.5 dB typ.	±1.5 dB typ.	
		Frequ	Frequency	
	Level	3 GHz<, ≤4 GHz	- 4 GHz<, ≤5 GHz	
	+13 dBm<, ≤+20 dBm	±0.7 dB		
	+11 dBm<, ≤+13 dBm	±0.7 dB	±0.8 dB	
	+1 dBm≤, ≤+11 dBm	±0.7 dB	±0.8 dB	
	_40 dBm<, <+1 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.7 dB	±0.8 dB	
	–120 dBm<, ≤–110 dBm	±0.7 dB	±1.0 dB	
	–127 dBm<, ≤–120 dBm	±2.5 dB typ.	±2.5 dB typ.	

Items	Specifications			
Accuracy	Level	Frequency		
	1 10 11 11 10	5 GHz<, ≤6 GHz		
	+1 dBm≤, ≤+11 dBm	±0.8 dB		
	_40 dBm<, <+1 dBm	±0.8 dB		
	_100 dBm<, ≤_40 dBm	±0.8 dB		
	_110 dBm<, ≤_100 dBm	±0.8 dB		
	_120 dBm<, ≤_110 dBm	±1.0 dB		
	–127 dBm<, ≤–120 dBm	±2.5 dB typ.		
	1st SG: MG3710A/10E/40A- 2nd SG: MG3710A/10E/40A- 1st SG: MG3710A/10E/40A- 2nd SG: MG3710A/10E/40	073/173 installed A-041/141/042/142 not	,	
		Frequency		
	Level		100 kHz≤, <1 MHz	
	–100 dBm<, ≤+2 dBm		±0.5 dB typ.	
	Level	Frequency		
		1 MHz≤, <10 MHz		
	+2 dBm<, ≤+7 dBm	,	±0.7 dB typ.	
	–110 dBm<, ≤+2 dBm	±0.5 dB typ.	±0.5 dB typ.	
		1		
	Level	Frequ	ency	
		50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
			±0.5 dB	
	–2 dBm≤, ≤+10 dBm	$\pm 0.5 \text{ dB}$	-0.0 aD	
	_2 dBm≤, ≤+10 dBm _40 dBm<, <−2 dBm	$\pm 0.5 \text{ dB}$ $\pm 0.5 \text{ dB}$	±0.5 dB	
	_40 dBm<, <-2 dBm _110 dBm<, ≤-40 dBm	±0.5 dB	±0.5 dB ±0.5 dB	
	-40 dBm<, <−2 dBm	±0.5 dB ±0.5 dB	±0.5 dB ±0.5 dB	
	40 dBm<, <-2 dBm 110 dBm<, ≤40 dBm	±0.5 dB ±0.5 dB Frequ 3 GHz<, ≤4 GHz	±0.5 dB ±0.5 dB ency 4 GHz<, ≤5 GHz	
	_40 dBm<, <-2 dBm _110 dBm<, ≤-40 dBm 	±0.5 dB ±0.5 dB Frequ 3 GHz<, ≤4 GHz ±0.7 dB	±0.5 dB ±0.5 dB ency 4 GHz<, ≤5 GHz ±0.8 dB	
	40 dBm<, <-2 dBm 110 dBm<, ≤40 dBm	±0.5 dB ±0.5 dB Frequ 3 GHz<, ≤4 GHz ±0.7 dB ±0.7 dB	±0.5 dB ±0.5 dB ency 4 GHz<, ≤5 GHz ±0.8 dB ±0.8 dB	
	_40 dBm<, <-2 dBm _110 dBm<, ≤-40 dBm 	±0.5 dB ±0.5 dB Frequ 3 GHz<, ≤4 GHz ±0.7 dB	±0.5 dB ±0.5 dB ency 4 GHz<, ≤5 GHz ±0.8 dB	

Items	Specifications			
Accuracy		Frequency		
	Level	5 GHz<, ≤6 GHz		
	_2 dBm≤, ≤+8 dBm	±0.8 dB		
		±0.8 dB		
	_100 dBm<, ≤–40 dBm	±0.8 dB		
		±0.8 dB		
	1st SG: MG3710A/10E/40 2nd SG: MG3710A/10E/40	0A-071/171 installed, 0	72/172 not installed	
	Level	Frequ		
	100.15		100 kHz≤, <1 MHz	
	–100 dBm<, ≤+2 dBm		±0.5 dB typ.	
		Frequ	Jency	
	Level	1 MHz≤, <10 MHz	10 MHz≤, <50 MHz	
	+2 dBm<, ≤+7 dBm		±0.7 dB typ.	
	–110 dBm<, ≤+2 dBm	±0.5 dB typ.	±0.5 dB typ.	
		Frequency		
	Level			
		50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+17 dBm<, ≤+20 dBm		±0.6 dB	
	+10 dBm<, ≤+17 dBm	±0.6 dB	±0.6 dB	
	_2 dBm≤, ≤+10 dBm	±0.6 dB	±0.5 dB	
	40 dBm<, < 2 dBm	±0.5 dB	±0.5 dB	
	–110 dBm<, ≤–40 dBm	$\pm 0.5 \text{ dB}$	±0.5 dB	
		Frequ	Jency	
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤5 GHz	
	+10 dBm<, <u><</u> +17 dBm	±0.7 dB		
	+8 dBm<, ≤+10 dBm	±0.7 dB	±0.8 dB	
	_2 dBm≤, ≤+8 dBm	±0.7 dB	±0.8 dB	
	40 dBm<, <2 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.7 dB	±0.8 dB	

Items		Specifications	
		1	
Accuracy	Level	Frequency	
		5 GHz<, ≤6 GHz	
	2 dBm≤, ≤+8 dBm	±0.8 dB	
	_40 dBm<, <_2 dBm	±0.8 dB	
	_100 dBm<, ≤_40 dBm	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.8 dB	
	1st SG: MG3710A/10E/40 2nd SG: MG3710A/10E/40		
	Level	Frequ	Jency
	Level		100 kHz≤, <1 MHz
	–100 dBm<, ≤+2 dBm		±0.5 dB typ.
		_	
	Level	Frequ	
		1 MHz≤, <10 MHz	10 MHz≤, <50 MHz
	+2 dBm<, ≤+7 dBm		$\pm 0.7 \text{ dB typ.}$
	_120 dBm<, ≤+2 dBm	$\pm 0.5 \text{ dB typ.}$	±0.5 dB typ.
		Frequency	Jency
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz
	–2 dBm≤, ≤+10 dBm	±0.5 dB	±0.5 dB
	_40 dBm<, <−2 dBm	±0.5 dB	±0.5 dB
	_110 dBm<, ≤_40 dBm	±0.5 dB	±0.5 dB
	–120 dBm<, ≤–110 dBm	±0.5 dB	±0.7 dB
	–127 dBm<, ≤–120 dBm	±0.7 dB	±1.0 dB
	–136 dBm<, ≤–127 dBm	±1.5 dB typ.	±1.5 dB typ.
	Level	Frequ	uency
		3 GHz<, ≤4 GHz	4 GHz<, ≤5 GHz
	+8 dBm<, ≤+10 dBm	±0.7 dB	±0.8 dB
	_2 dBm≤, ≤+8 dBm	±0.7 dB	±0.8 dB
	40 dBm<, <2 dBm	±0.7 dB	±0.8 dB
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB
	–110 dBm<, ≤–100 dBm	±0.8 dB	±0.8 dB
	–120 dBm<, ≤–110 dBm	±1.0 dB	±1.0 dB
		±2.5 dB typ.	±2.5 dB typ.

Items	Specifications			
Accuracy		Frequency		
	Level	5 GHz<, ≤6 GHz		
	_2 dBm≤, ≤+8 dBm	±0.8 dB		
	_40 dBm<, <−2 dBm	±0.8 dB		
	–100 dBm<, ≤–40 dBm	±0.8 dB		
	–110 dBm<, ≤–100 dBm	±0.8 dB		
	–120 dBm<, ≤–110 dBm	±1.0 dB		
	–127 dBm<, ≤–120 dBm	±2.5 dB typ.		
	2nd SG: MG3710A/10E/40		stalled uency	
	Level		 100 kHz≤, <1 MHz	
	–100 dBm<, ≤+2 dBm		±0.5 dB typ.	
			·	
		Frequency		
	Level	1 MHz≤, <10 MHz	10 MHz≤, <50 MHz	
	+2 dBm<, ≤+7 dBm		±0.7 dB typ.	
	–120 dBm<, ≤+2 dBm	±0.5 dB typ.	±0.5 dB typ.	

Items		Specifications		
Accuracy		Frequency		
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	+17 dBm<, ≤+20 dBm		±0.6 dB	
	+10 dBm<, ≤+17 dBm	±0.6 dB	±0.6 dB	
	–2 dBm≤, ≤+10 dBm	±0.6 dB	$\pm 0.5 \text{ dB}$	
	_40 dBm<, <–2 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	–110 dBm<, ≤–40 dBm	±0.5 dB	$\pm 0.5 \text{ dB}$	
	–120 dBm<, ≤–110 dBm	±0.5 dB	±0.7 dB	
	–127 dBm<, ≤–120 dBm	±0.7 dB	±1.0 dB	
	–136 dBm<, ≤–127 dBm	±1.5 dB typ.	±1.5 dB typ.	
		Frequ	iency	
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤5 GHz	
	+10 dBm<, ≤+17 dBm	±0.7 dB		
	+8 dBm<, ≤+10 dBm	±0.7 dB	±0.8 dB	
	–2 dBm≤, ≤+8 dBm	±0.7 dB	±0.8 dB	
	_40 dBm<, <–2 dBm	±0.7 dB	±0.8 dB	
	–100 dBm<, ≤–40 dBm	±0.7 dB	±0.8 dB	
	–110 dBm<, ≤–100 dBm	±0.8 dB	±0.8 dB	
	–120 dBm<, ≤–110 dBm	±1.0 dB	±1.0 dB	
	–127 dBm<, ≤–120 dBm	±2.5 dB typ.	±2.5 dB typ.	
		Frequ	iency	
	Level	5 GHz<, ≤6 GHz		
	–2 dBm<, ≤+8 dBm	±0.8 dB		
		±1.0 dB		
		±2.5 dB typ.		

Items	Specifications				
Linearity	CW, at 18 to 28°C				
	1st SG: MG3710A/10E/40A-043/143 not installed, 2nd SG: MG3710A/10E/40A-073/173 not installed				
	1st SG: MG3710A/10E/40 2nd SG: MG3710A/10E/4				
	Reference: -7 dBm				
		Frequency			
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz		
	_40 dBm<, <+1 dBm	±0.2 dB typ.	±0.2 dB typ.		
	–110 dBm<, ≤–40 dBm	±0.2 dB typ.	±0.2 dB typ.		
		Frequ	iency		
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz		
	_40 dBm<, <+1 dBm	±0.3 dB typ.	±0.3 dB typ.		
	_100 dBm<, ≤_40 dBm	±0.3 dB typ.	±0.3 dB typ.		
	_110 dBm<, ≤_100 dBm	±0.3 dB typ.	±0.3 dB typ.		
	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 not installed Reference: -7 dBm Frequency				
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz		
	_40 dBm<, <+1 dBm	$\pm 0.2 \text{ dB typ.}$	±0.2 dB typ.		
	-110 dBm<, <-40 dBm	$\pm 0.2 \text{ dB typ.}$ $\pm 0.2 \text{ dB typ.}$	$\pm 0.2 \text{ dB typ.}$		
	Level	Frequency			
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz		
			,		
	-40 dBm<, <+1 dBm	±0.3 dB typ.	±0.3 dB typ.		

Items	Specifications		
Linearity	1st SG: MG3710A/10E/40A 2nd SG: MG3710A/10E/40A Reference: –7 dBm	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
		Frequ	iency
		50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz
	_40 dBm<, <+1 dBm	±0.2 dB typ.	±0.2 dB typ.
	–110 dBm<, ≤–40 dBm	±0.2 dB typ.	$\pm 0.2 \text{ dB typ.}$
	–120 dBm<, ≤–110 dBm	±0.2 dB typ.	±0.2 dB typ.
	Frequen		iency
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz
	_40 dBm<, <+1 dBm	±0.3 dB typ.	±0.3 dB typ.
	–100 dBm<, ≤–40 dBm	±0.3 dB typ.	±0.3 dB typ.
	–110 dBm<, <u>≤</u> –100 dBm	±0.3 dB typ.	±0.3 dB typ.
	–120 dBm<, ≤–110 dBm	±0.3 dB typ.	
	1st SG: MG3710A/10E/40A-041/141/042/142 installed, 2nd SG: MG3710A/10E/40A-071/171/072/172 installed Reference: -7 dBm Frequency		,
	Reference: –7 dBm	1	
		1	
	Reference: –7 dBm	Frequ	iency
	Reference: –7 dBm	Frequ 50 MHz≤, <400 MHz	lency 400 MHz≤, ≤3 GHz
	Reference: -7 dBm Level -40 dBm<, <+1 dBm	Frequ 50 MHz≤, <400 MHz ±0.2 dB typ.	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ.
	Reference: -7 dBm Level -40 dBm<, <+1 dBm -110 dBm<, ≤-40 dBm	Frequ 50 MHz≤, <400 MHz ±0.2 dB typ. ±0.2 dB typ.	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ.
	Reference: -7 dBm Level -40 dBm<, <+1 dBm	Frequ 50 MHz≤, <400 MHz ±0.2 dB typ. ±0.2 dB typ.	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ. ±0.2 dB typ.
	Reference: -7 dBm Level -40 dBm<, <+1 dBm -110 dBm<, ≤-40 dBm	Freque 50 MHz≤, <400 MHz	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ. ±0.2 dB typ.
	Reference: -7 dBm Level -40 dBm<, <+1 dBm	Freque 50 MHz≤, <400 MHz	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ. ±0.2 dB typ. tency
	Reference: -7 dBm Level -40 dBm<, <+1 dBm	Frequencies 50 MHz≤, <400 MHz	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ. ±0.2 dB typ. tency 4 GHz<, ≤6 GHz
	Reference: -7 dBm Level -40 dBm<, <+1 dBm	Freque 50 MHz≤, <400 MHz	tency 400 MHz≤, ≤3 GHz ±0.2 dB typ. ±0.2 dB typ. ±0.2 dB typ. ency 4 GHz<, ≤6 GHz ±0.3 dB typ.

Items	Specifications				
Linearity	1st SG: MG3710A/10E/40A-0 2nd SG: MG3710A/10E/40A-	<i>,</i>			
	1st SG: MG3710A/10E/40A 2nd SG: MG3710A/10E/40		,		
	Reference: –10 dBm				
	Level	Frequency			
		50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz		
	40 dBm<, <-−2 dBm	±0.2 dB typ.	$\pm 0.2 \text{ dB typ.}$		
	–110 dBm<, ≤–40 dBm	±0.2 dB typ.	±0.2 dB typ.		
		Frequency			
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz		
	_40 dBm<, <−2 dBm	±0.3 dB typ.	±0.3 dB typ.		
	–100 dBm<, ≤–40 dBm	±0.3 dB typ.	±0.3 dB typ.		
	–110 dBm<, ≤–100 dBm	±0.4 dB typ.	±0.4 dB typ.		
	1st SG: MG3710A/10E/40A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/10E/40A-071/171 installed, 072/172 not installed Reference: -10 dBm Frequency				
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz		
	_40 dBm<, <−2 dBm		-		
		±0.2 dB typ. ±0.2 dB typ.	±0.2 dB typ. ±0.2 dB typ.		
		±0.2 dB typ.	±0.2 dB typ.		
	Level	Frequency			
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz		
	_40 dBm<, <−2 dBm	±0.3 dB typ.	±0.3 dB typ.		
	–100 dBm<, ≤–40 dBm	±0.3 dB typ.	±0.3 dB typ.		

Items	Specifications			
Linearity	1st SG: MG3710A/10E/40A 2nd SG: MG3710A/10E/40A Reference: –10 dBm			
	Frequence		ιсу	
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	_40 dBm<, <−2 dBm	±0.2 dB typ.	±0.2 dB typ.	
	–110 dBm<, ≤–40 dBm	$\pm 0.2 \text{ dB typ.}$	±0.2 dB typ.	
		Frequency		
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz	
	_40 dBm<, <−2 dBm	±0.3 dB typ.	±0.3 dB typ.	
	–100 dBm<, ≤–40 dBm	±0.3 dB typ.	±0.3 dB typ.	
	–110 dBm<, ≤–100 dBm	±0.4 dB typ.	±0.4 dB typ.	
		DE/40A-041/141/042/142 installed, 0E/40A-071/171/072/172 installed Frequency		
	Level	50 MHz≤, <400 MHz	400 MHz≤, ≤3 GHz	
	_40 dBm<, <−2 dBm	±0.2 dB typ.	±0.2 dB typ.	
	–110 dBm<, ≤–40 dBm	±0.2 dB typ.	$\pm 0.2 \text{ dB typ.}$	
		1		
	Level	Frequency		
	Level	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz	
	40 JD 0 JD	±0.3 dB typ.	±0.3 dB typ.	
	_40 dBm<, <−2 dBm	•••• •·- •J I••	<i>v</i> 1	
	_40 dBm<, <-2 dBm _100 dBm<, ≤-40 dBm	$\pm 0.3 \text{ dB typ.}$	±0.3 dB typ.	

<ATT Hold>

Items		Specifications
ATT Hold function	generation is a	d is turned on, level adjustment of continuous signal vailable. –10 dB to +10 dB. (However, each upper and lower limit of the adjustment range is restricted by the signal output
		range.)
	Resolution:	0.01 dB

<Output connector>

Items	Specifications			
Connector	Front panel, RF Output, 2nd RF Output (Opt), N-J connector, 50 Ω			
VSWR	1st SG: MG3710A/10E/40A-043/143 not installed, 2nd SG: MG3710A/10E/40A-073/173 not installed			
			Frequency	
	Level	50 MHz≤, ≤3 GHz	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz
	≤–7 dBm	≤1.45	≤ 1.65	≤1.9
	1st SG: MG3710A/10E/40A-043/143 installed, 2nd SG: MG3710A/10E/40A-073/173 installed			
	Frequency			
	Level	50 MHz≤, ≤3 GHz	3 GHz<, ≤4 GHz	4 GHz<, ≤6 GHz
	≤–10 dBm	≤1.45	≤ 1.65	≤1.9

<Maximum reverse input>

Items	Specifications
Maximum reverse input	
Maximum reverse input voltage	±50 V DC Max Common to 1st and 2nd SG
Maximum reverse input power	1st SG: MG3710A/10E/40A-043/143 not installed, 2nd SG: MG3710A/10E/40A-073/173 not installed 2 W (Nominal) 1st SG: MG3710A/10E/40A-043/143 installed, 2nd SG: MG3710A/10E/40A-073/173 installed
	20 W (Nominal) (1 MHz <reverse frequency≤1="" ghz)<="" input="" power="" td="">20 W (Nominal) (1 GHz< Reverse input power frequency ≤2 GHz)</reverse>

<Signal purity>

Items		Specifica	ations	
Iarmonic purious	At CW, Optimize	e S/N = Off		
F		A/10E/40A-043/143 not 0A/10E/40A-073/173 no		
		10A/10E/40A-041/141 1 710A/10E/40A-071/171	-	
		Frequency		
	Level	10 MHz≤, ≤3 GHz	3 GHz<	
	≤+4 dBm	≤-30 dBc	≤-30 dBc	
		10A/10E/40A-041/141 i 710A/10E/40A-071/171	-	
			Frequency	
	Level	10 MHz≤, <50 MHz	50 MHz ≤, ≤3 GHz	3 GHz<
	≤+4 dBm	≤–30 dBc		
	≤+12 dBm		≤–30 dBc	
	<u>≤</u> +4 dBm			≤–30 dBc
			, 11 1	
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37	A/10E/40A-043/143 ins 0A/10E/40A-073/173 ins 10A/10E/40A-041/141 n 710A/10E/40A-071/171	stalled not installed,	
	2nd SG: MG3710 1st SG: MG37	0A/10E/40A-073/173 in 10A/10E/40A-041/141 i	stalled not installed, not installed	
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37	0A/10E/40A-073/173 in: 10A/10E/40A-041/141 n 710A/10E/40A-071/171	stalled not installed, not installed Frequency	
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm 1st SG: MG37	0A/10E/40A-073/173 in: 10A/10E/40A-041/141 n 710A/10E/40A-071/171 10 MHz≤, ≤3 GHz	stalled not installed, not installed Frequency 3 GHz< <-30 dBc installed, installed	
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm 1st SG: MG37	0A/10E/40A-073/173 in: 10A/10E/40A-041/141 n 710A/10E/40A-071/171 10 MHz≤, ≤3 GHz ≤-30 dBc 10A/10E/40A-041/141 i 710A/10E/40A-071/171	stalled not installed, not installed Frequency 3 GHz< S GHz installed, installed Frequency	
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm 1st SG: MG37 2nd SG: MG37 Level	DA/10E/40A-073/173 ins 10A/10E/40A-041/141 n 710A/10E/40A-071/171 10 MHz≤, ≤3 GHz ≤-30 dBc	stalled not installed, not installed Frequency 3 GHz< <-30 dBc installed, installed	3 GHz<
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm	0A/10E/40A-073/173 in: 10A/10E/40A-041/141 n 710A/10E/40A-071/171 10 MHz≤, ≤3 GHz ≤-30 dBc 10A/10E/40A-041/141 i 710A/10E/40A-071/171	stalled not installed, not installed Frequency 3 GHz< S GHz installed, installed Frequency	3 GHz<
	2nd SG: MG3710 1st SG: MG37 2nd SG: MG37 Level ≤+1 dBm 1st SG: MG37 2nd SG: MG37 Level	0A/10E/40A-073/173 ins 10A/10E/40A-041/141 n 710A/10E/40A-071/171 10 MHz≤, ≤3 GHz ≤-30 dBc 10A/10E/40A-041/141 i 710A/10E/40A-071/171 10 MHz≤, <50 MHz	stalled not installed, not installed Frequency 3 GHz< S GHz installed, installed Frequency	3 GHz<

<signal< th=""><th>purity></th><th>Cont'd</th></signal<>	purity>	Cont'd
---	---------	--------

Items	Specifications	
Non-harmonic spurious	Under the conditions of $-30 \text{ dBm} \le \text{output level} \le +5 \text{ dBm}$, CW generation, 10 kHz or more frequency offset from the output frequency.	
	<-62 dBc (-70 dBc typ.) (100 kHz≤frequency≤187.5 MHz)	
	<-68 dBc (-76 dBc typ.) (187.5 MHz <frequency<750 mhz)<="" td=""></frequency<750>	
	<-62 dBc (-76 dBc typ.) (750 MHz <frequency≤1.5 ghz)<="" td=""></frequency≤1.5>	
	<−56 dBc (−70 dBc typ.) (1.5 GHz <frequency≤3 ghz)<="" td=""></frequency≤3>	
	<−50 dBc (−64 dBc typ.) (3 GHz <frequency≤6 ghz)<="" td=""></frequency≤6>	
SSB phase noise	At Phase Noise Opt.: <200 kHz, CW, 20 kHz offset:	
	<-140 dBc/Hz (Nominal) (100 MHz)	
	<–131 dBc/Hz typ. (1 GHz)	
	<-125 dBc/Hz typ. (2 GHz)	

Items	Specifications
Optimize Function	• Spurious mode
	Mode to control spurious problem. Controls spurious generated by the modulator.
	• Distortion mode
	Mode to control distortion problem. Optimizes the setting automatically to avoid distortions.
	This mode can be used when the output frequency is 7 MHz or higher .
Amplitude Modulation	Available only for internal modulation. Specified only for the modulation onto CW.
	In MG3740A, Optimize Function is set to Distortion.
AM Depth Type	• Lin
	Displays the AM depth type in linear.
	• Exp
	Displays the AM depth type into the log format.
AM Depth	Range: 0% to 100.0%, Resolution: 0.1%
AM Depth Error	Under the conditions:
(MG3710A/10E)	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m \leq 90%.
	< (3% of the set value + 2%) (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m $\leq 90\%$.
	< (2% of the set value + 1%) (Nominal)
AM Depth Error	Under the conditions:
(MG3740A)	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m $\leq 20\%$.
	< (2% of the set value + 1%) (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz,AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz,AM Source = Sine, and 20% \leq modulation ratio m $\leq 90\%$.
	<(2% of the set value + 1%)

Items	Specifications
Amplitude Modulation	
(Cont'd)	
Distortion	Under the conditions:
(MG3710A/10E)	<pre>peak level ≤ 4 dBm, 100 kHz ≤ frequency range < 98 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 30%. < 2% (Nominal)</pre>
	Under the conditions:
	peak level < 4 dBm, 100 kHz < frequency range < 98 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 90%. < 2.5% (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz ≤ frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 30%. < 0.5% (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 90%. < 0.5% (Nominal)
Distortion	Under the conditions:
(MG3740A)	peak level ≤ 4 dBm, 100 kHz \leq frequency range < 7 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 30%.
	< 2% (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 100 kHz ≤ frequency range < 7 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 90%. < 2.5% (Nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 7 MHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 30%.
	Under the conditions: peak level < 4 dBm, 7 MHz < frequency range < 98 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 90%.
	< 2.5%
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 30%.
	<1%

Items	Specifications
Amplitude Modulation	
(Cont'd)	
Distortion	Under the conditions:
(MG3740A)	<pre>peak level ≤ 4 dBm, 98 MHz ≤ frequency range ≤ 2700 MHz, AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio m = 90%. < 1%</pre>
Modulation	Under the conditions:
Frequency Response	peak level ≤ 4 dBm, 100 kHz ≤ frequency range < 98 MHz,
(MG3710A/10E)	AM Depth Type = Lin, modulation ratio $m = 30\%$, after CAL execution, and bandwidth within ± 1.5 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ± 1.5 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ± 1 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ± 1 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)

Items	Specifications
Amplitude Modulation (Cont'd)	
Modulation	Under the conditions:
Frequency Response	peak level ≤ 4 dBm, 100 kHz \leq frequency range < 98 MHz,
(MG3740A)	AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ±1.5 dB.
	$0.1 \text{ Hz} \leq \text{modulation rate} \leq 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 100 kHz ≤ frequency range < 98 MHz,
	AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ±1.5 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz,
	AM Depth Type = Lin, modulation ratio $m = 30\%$, after CAL execution, and bandwidth within ± 1 dB.
	0.1 Hz ≤ modulation rate < 50 Hz (nominal)
	50 Hz \leq modulation rate \leq 100 kHz (typ.)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz ≤ frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ±1 dB.
	$0.1 \text{ Hz} \le \text{modulation rate} < 50 \text{ Hz} \text{ (nominal)}$ $50 \text{ Hz} \le \text{modulation rate} \le 100 \text{ kHz} \text{ (typ.)}$

Items	Specifications
Frequency Modulation	Available only for internal modulation. Specified only for the modulation onto CW.
	In MG3740A, Optimize Function is set to Distortion.
FM Deviation	Range: A value between 0 Hz and 40 MHz or the value of 50 MHz minus modulation rate, whichever is smaller.
	Resolution: 0.1 Hz
Deviation Accuracy	Under the conditions:
(MG3710A/10E)	output level≤ 4 dBm,
	100 kHz + 2 ×(modulation rate + 2 × deviation) \leq frequency \leq 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and 20 Hz \leq deviation \leq 40 kHz.
	< (2% of the set value + 20 Hz) (Nominal)
Deviation Accuracy	Under the conditions:
(MG3740A)	output level≤ 4 dBm,
	100 kHz + 2 ×(modulation rate + 2 × deviation) \leq frequency \leq 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and 20 Hz \leq deviation \leq 200 Hz.
	< (2% of the set value + 20 Hz) (Nominal)

Items	Specifications
Frequency Modulation	
(Cont'd)	
Deviation Accuracy	Under the conditions:
(MG3740A)	output level≤ 4 dBm, 250 kHz + 2 ×(modulation rate + 2 × deviation) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and 200 Hz ≤ deviation ≤ 40 kHz. (Deviation ÷ modulation rate) > 0.2:
	< (3% of the set value + 20 Hz)
	< (1.26% of the set value + 20 Hz) (typ.)
	(Deviation \div modulation rate) > 1.2:
	< (3% of the set value + 20 Hz)
	< (1.84% of the set value + 20 Hz) (typ.)
Distortion (MG3710A/10E)	Under the conditions:
(MG3710A/10E)	output level ≤ 4 dBm, 100 kHz + 2 ×(modulation rate + 2 × deviation) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 22.5 kHz. < 0.5% (Nominal)
	Under the conditions:
	output level $\leq 4 \text{ dBm}$,
	100 kHz + 2 ×(modulation rate + 2 × deviation) \leq frequency \leq 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 3.5 kHz.
	< 1% (Nominal)
Distortion	Under the conditions:
(MG3740A)	output level $\leq 4 \text{ dBm}$, $100 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} < 1 \text{ MHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}),$ after CAL execution, modulation rate = 1 kHz, FM Source = Sine,
	and deviation = 22.5 kHz.
	< 0.5% (Nominal)
	Under the conditions:
	output level ≤ 4 dBm, 1 MHz + 2 ×(modulation rate + 2 × deviation) \leq frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 22.5 kHz.
	< 0.4%
	Under the conditions:
	output level $\leq 4 \text{ dBm}$, 100 kHz + 2 ×(modulation rate + 2 × deviation) \leq frequency < 1 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 3.5 kHz.
	< 1% (Nominal)

Items	Specifications
Frequency Modulation (Cont'd)	
Distortion	Under the conditions:
(MG3740A)	output level ≤ 4 dBm, 1 MHz + 2 ×(modulation rate + 2 × deviation) \leq frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 3.5 kHz. < 0.5%
Modulation	Under the conditions:
Frequency Response (MG3710A/10E)	output level ≤ 4 dBm, 100 kHz + 2 ×(modulation rate + 2 × deviation) ≤ frequency ≤ 2700 MHz, deviation = 40 kHz, after CAL execution, and bandwidth within ±1 dB. 20 Hz ≤ modulation rate ≤ 20 kHz (nominal)
Modulation	Under the conditions:
Frequency Response (MG3740A)	output level ≤ 4 dBm, 100 kHz + 2 ×(modulation rate + 2 × deviation) \leq frequency < 10 MHz, deviation = 40 kHz, after CAL execution, and bandwidth within ±1 dB. 20 Hz \leq modulation rate \leq 20 kHz (nominal)
	Under the conditions:
	$ \begin{array}{l} Output \ level \leq 4 \ dBm, \\ 10 \ MHz \leq frequency \leq 2700 \ MHz, \ deviation = 40 \ kHz, \\ after \ CAL \ execution, \ and \ bandwidth \ within \ \pm 1 \ dB. \\ 20 \ Hz \leq modulation \ rate \leq 20 \ kHz \ (nominal) \end{array} $

Items	Specifications
Phase Modulation	Available only for internal modulation. Specified only for the modulation onto CW.
	In MG3740A, Optimize Function is set to Distortion.
PM Deviation	Range: A value between 0 rad and 160 rad or the value of 40 MHz divided by the modulation rate, whichever is smaller.
	Resolution: 0.001 rad
Deviation Accuracy	Under the conditions:
(MG3710A/10E)	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) \leq frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, ϕ M Source = Sine, and deviation ≤ 20 rad.
	< (2% of the set value + 0.02 rad) (Nominal)
Deviation Accuracy	Under the conditions:
(MG3740A)	$ \begin{array}{l} \mbox{output level} \leq 4 \mbox{ dBm, } 100 \mbox{ kHz} + 2 \times (\mbox{modulation rate} + 2 \times \mbox{deviation} \times \\ \mbox{modulation rate}) \leq \mbox{frequency} \leq 2700 \mbox{ MHz, after CAL execution,} \\ \mbox{modulation rate} = 1 \mbox{ kHz, } \mbox{\phi} M \mbox{ Source} = \mbox{Sine, and } 0 < \mbox{deviation} \leq 0.7 \mbox{ rad.} \end{array} $
	< (2% of the set value + 0.02 rad) (Nominal)
	Under the conditions:
	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) \leq frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, ϕ M Source = Sine, and 0.7< deviation ≤ 20 rad.
	< (3% of the set value + 0.02 rad)
	<(1.84% of the set value + 0.02 rad) (typ.)
Distortion	Under the conditions:
	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) \leq frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, ϕ M Source = Sine, and deviation = 20 rad.
	MG3710A/10E: <0.2% (Nominal)
	MG3740A: <0.2% (typ.)
Modulation	Under the conditions:
Frequency Response (MG3710A/10E)	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) \leq frequency ≤ 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ±1 dB.
	$20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
Modulation	Under the conditions:
Frequency Response (MG3740A)	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) \leq frequency ≤ 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ±1 dB.
	$20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)

Items	Specifications
Pulse Modulation	
On/Off ratio	>70 dB $(50 \text{ MHz} \le \text{Output frequency} \le 3 \text{ GHz})$
	>60 dB (3 GHz < Output frequency \leq 6 GHz
Minimum pulse width	1 μs (Nominal)
Rising/Falling time	≤50 ns (10 to 90%) (Nominal)
Pulse repetition frequency	DC to 1 MHz (Duty 50%)
External pulse modulation signal input	Rear panel AUX connector, TTL
	H = signal output/L = signal off
Internal modulation signal	
Waveform	Sine wave, Triangular wave, Square wave, Ramp wave (Positive or Negative)
Modulation rate	Sine wave: 0.01 Hz to 40 MHz or (50 MHz – FMDeviation) Triangular wave, Square wave, Ramp wave: 0.01 Hz to 4 MHz or (5 MHz – FMDeviation)
Frequency resolution	0.1 Hz
Phase	-180 deg to 180 deg
Phase resolution	0.1 deg
External modulation signal	When MG3710A/10E/40A-050/150/080/180 is installed and for 1st SG and 2nd SG respectively Specified only for the modulation onto CW.
	In MG3740A, Optimize Function is set to Distortion.
Modulation type	AM, FM, ϕ M
Input Impedance	50 Ω/600 Ω/Hi-Z (100 kΩ/70 pF) (nominal)
Coupling	DC or AC is alternatively selectable.
Input level	For set value, 2 Vp-p (nominal)
Input Frequency	DC coupling: DC to 1 MHz (nominal)
	AC coupling: 20 Hz (typ.) to 1 MHz (nominal)
Simultaneous	AM + FM
modulation	$AM + \phi M$
	Internal 1 + Internal 2
	Internal + External
	FM and ϕ M cannot enabled simultaneously.

Items	Specifications
External modulation signal (Cont'd)	
Amplitude Modulation	Under the conditions:
Frequency Response (MG3710A/10E)	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ±1.5 dB.
	DC coupling: DC ≤ modulation rate ≤ 20 kHz (nominal)
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ± 1.5 dB.
	DC coupling: $DC \le modulation rate \le 20 \text{ kHz} (nominal)$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ± 1 dB.
	DC coupling: DC ≤ modulation rate < 20 kHz (nominal)
	AC coupling: 20 Hz ≤ modulation rate < 20 kHz (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ±1 dB.
	DC coupling: $DC \leq modulation rate < 20 \text{ kHz} (nominal)$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} < 20 \text{ kHz} (nominal)$

Items	Specifications
External modulation signal (Cont'd)	
Amplitude Modulation	Under the conditions:
Frequency Response	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz,
(MG3740A)	AM Depth Type = Lin, modulation ratio $m = 30\%$, after CAL execution, and bandwidth within ± 1.5 dB.
	DC coupling: $DC \le modulation rate \le 20 \text{ kHz} (nominal)$
	AC coupling: 20 Hz \leq modulation rate \leq 20 kHz (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 100 kHz \leq frequency range $<$ 98 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ±1.5 dB.
	DC coupling: DC ≤ modulation rate ≤ 20 kHz (nominal)
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ±1 dB.
	DC coupling: DC ≤ modulation rate < 50 Hz (nominal)
	$50 \text{ Hz} \le \text{modulation rate} \le 100 \text{ kHz}$ (typ.)
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} < 50 \text{ Hz} \text{ (nominal)}$
	$50 \text{ Hz} \le \text{modulation rate} \le 100 \text{ kHz}$ (typ.)
	Under the conditions:
	peak level ≤ 4 dBm, 98 MHz \leq frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ± 1 dB.
	DC coupling: $DC \le modulation rate < 50 Hz$ (nominal)
	$50 \text{ Hz} \le \text{modulation rate} \le 100 \text{ kHz}$ (typ.)
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} < 50 \text{ Hz} \text{ (nominal)}$
	$50 \text{ Hz} \le \text{modulation rate} \le 100 \text{ kHz}$ (typ.)

Items	Specifications
External modulation	
signal (Cont'd)	
Frequency Modulation	Under the conditions:
Frequency Response	output level $\leq 4 \text{ dBm}$,
(MG3710A/10E)	$100 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} \leq 2700 \text{ MHz},$
	deviation = 40 kHz, after CAL execution, and bandwidth within ± 1 dB.
	DC coupling: $DC \le modulation rate \le 20 \text{ kHz (nominal)}$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
Frequency Modulation	Under the conditions:
Frequency Response (MG3740A)	output level $\leq 4 \text{dBm}$,
(MG3740A)	$100 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} < 10 \text{ MHz},$ deviation = 40 kHz, after CAL execution, and bandwidth within ±1 dB.
	DC coupling: $DC \le modulation rate \le 20 \text{ kHz} (nominal)$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
	Under the conditions: $20 \text{ Hz} \le 100000000000000000000000000000000000$
	output level $\leq 4 \text{ dBm}$,
	10 MHz \leq frequency \leq 2700 MHz, deviation = 40 kHz,
	after CAL execution, and bandwidth within ±1 dB.
	DC coupling: DC ≤ modulation rate < 50 Hz (nominal)
	$50 \text{ Hz} \le \text{modulation rate} \le 200 \text{ kHz}$ (typ.)
	AC coupling: 20 Hz ≤ modulation rate < 50 Hz (nominal)
	$50 \text{ Hz} \le \text{modulation rate} \le 200 \text{ kHz}$ (typ.)
Phase Modulation	Under the conditions:
Frequency Response	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation ×
(MG3710A/10E)	modulation rate) \leq frequency \leq 2700 MHz, deviation = 2 rad, after CAL
	execution, and bandwidth within ± 1 dB.
	DC coupling: $DC \le modulation rate \le 20 \text{ kHz} (nominal)$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (nominal)
Phase Modulation	Under the conditions:
Frequency Response (MG3740A)	output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation ×
	modulation rate) \leq frequency \leq 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ± 1 dB.
	DC coupling: $DC \leq \text{modulation rate} < 200 \text{ Hz (nominal)}$
	$200 \text{ Hz} \le \text{modulation rate} \le 200 \text{ Hz}$ (homma) $200 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz}$ (typ.)
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} \le 20 \text{ KHz} (typ.)$
	AC coupling: $20 \text{ Hz} \le \text{modulation rate} < 200 \text{ Hz (nominal)}$ $200 \text{ Hz} \le \text{modulation rate} \le 20 \text{ kHz (typ.)}$
	$200 \text{ Hz} \le \text{modulation rate} \le 20 \text{ KHz}$ (typ.)

<Vector modulation>

Items	Specifications
Modulation Frequency	At 18 to 28°C
Response	When MG3710A/10E-043/143 is not installed:
1st SG (MG3710A/10E)	Internal Channel Correction = On,
	Random signal of Bandwidth 160 MHz, Crest Factor 11 dB.
	Output level = -7 dBm
	At output frequency: 850 MHz/1.8 GHz/1.9 GHz/2.2 GHz,
	±0.6 dB (At Center Frequency ±10 MHz) ±1.3 dB (At Center Frequency ±50 MHz)
	At output frequency: 3.5 GHz/5.8 GHz,
	$\pm 0.6 \text{ dB}$ (At Center Frequency $\pm 10 \text{ MHz}$)
	±1.9 dB (At Center Frequency ±50 MHz)
	When MG3710A/10E-043/143 is installed:
	Internal Channel Correction = On,
	Random signal of Bandwidth 160 MHz, Crest Factor 11 dB.
	Output level = -10 dBm
	At output frequency: 850 MHz/1.8 GHz/1.9 GHz/2.2 GHz,
	±0.6 dB (At Center Frequency ±10 MHz) ±1.8 dB (At Center Frequency ±50 MHz)
	At output frequency: 3.5 GHz/5.8 GHz,
	$\pm 0.6 \text{ dB}$ (At Center Frequency $\pm 10 \text{ MHz}$)
	±2.4 dB (At Center Frequency ±50 MHz)
Modulation Frequency	
Response	Same as 1st SG (MG3710A/10E)
2nd SG	
(MG3710A/10E)	

Items	Specifications
Vector accuracy	At 18 to 28°C
1st SG	After CAL execution
(MG3710A/10E)	When MG3710A/10E-043/143 is not installed:
	When W-CDMA (Test Model 4) is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz, Output level≤+7 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+13 dBm (When MG3710A/10E-041/141 is installed), ≤0.62% (rms) (0.6% (rms) typ.)
	When GSM is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+7 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+13 dBm (When MG3710A/10E-041/141 is installed),
	≤0.84° (rms) (0.8° (rms) typ.)
	When EDGE is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+7 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+13 dBm (When MG3710A/10E-041/141 is installed),
	≤0.84% (rms) (0.8% (rms) typ.)
	When LTE (20MHz Test Model 3.1) is modulated:
	Output frequency: 600 MHz to 2700 MHz, Output level≤+7 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+13 dBm (When MG3710A/10E-041/141 is installed),
	≤0.82% (rms) (0.8% (rms) typ.)
	Output frequency: 3400 MHz to 3800 MHz, Output level≤+4 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+10 dBm (When MG3710A/10E-041/141 is installed),
	≤0.82% (rms) (0.8% (rms) typ.)
	When MG3710A/10E-043/143 is installed:
	When W-CDMA (Test Model 4) is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz, Output level≤+4 dBm (When MG3710A/10E-041/141 is not installed),
	Output level≤+10 dBm (When MG3710A/10E-041/141 is installed), ≤0.62% (rms) (0.6% (rms) typ.)
	Solo2% (rms) (0.6% (rms) typ.) When GSM is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+4 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+10 dBm (When MG3710A/10E-041/141 is installed),
	≤0.84° (rms) (0.8° (rms) typ.)

Items	Specifications
Vector accuracy 1st SG (MG3710A/10E)	When EDGE is modulated: Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz, Output level≤+4 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+10 dBm (When MG3710A/10E-041/141 is installed), ≤0.84% (rms) (0.8% (rms) typ.) When LTE (20MHz Test Model 3.1) is modulated: Output frequency: 600 MHz to 2700 MHz, Output level≤+4 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+4 dBm (When MG3710A/10E-041/141 is installed), Output level≤+10 dBm (When MG3710A/10E-041/141 is installed), ≤0.82% (rms) (0.8% (rms) typ.) Output frequency: 3400 MHz to 3800 MHz, Output level≤+1 dBm (When MG3710A/10E-041/141 is not installed), Output level≤+7 dBm (When MG3710A/10E-041/141 is installed),
Vector accuracy 2nd SG (MG3710A/10E)	 ≤0.82% (rms) (0.8% (rms) typ.) When MG3710A/10E-073/173 is not installed: When W-CDMA (Test Model 4) is modulated: Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz, Output level≤+7 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+13 dBm (When MG3710A/10E-071/171 is installed), ≤0.62% (rms) (0.6% (rms) typ.) When GSM is modulated: Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+7 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+7 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+13 dBm (When MG3710A/10E-071/171 is not installed), S0.84° (rms) (0.8° (rms) typ.)
	 When EDGE is modulated: Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+7 dBm (When MG3710A/10E·071/171 is not installed), Output level≤+13 dBm (When MG3710A/10E·071/171 is installed), ≤0.84% (rms) (0.8% (rms) typ.) When LTE (20MHz Test Model 3.1) is modulated: Output frequency: 600 MHz to 2700 MHz, Output level≤+7 dBm (When MG3710A/10E·071/171 is not installed), Output level≤+13 dBm (When MG3710A/10E·071/171 is not installed), Senser (rms) (0.8% (rms) typ.) Output frequency: 3400 MHz to 3800 MHz, Output level≤+4 dBm (When MG3710A/10E·071/171 is not installed), Output level≤+10 dBm (When MG3710A/10E·071/171 is not installed), Senser (rms) (0.8% (rms) typ.)

Items	Specifications
Vector accuracy	When MG3710A/10E-073/173 is installed:
2nd SG	When W-CDMA (Test Model 4) is modulated:
(MG3710A/10E)	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz, Output level≤+4 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+10 dBm (When MG3710A/10E-071/171 is installed), ≤0.62% (rms) (0.6% (rms) typ.)
	When GSM is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+4 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+10 dBm (When MG3710A/10E-071/171 is installed),
	$\leq 0.84^{\circ} \text{ (rms)} (0.8^{\circ} \text{ (rms) typ.)}$
	When EDGE is modulated:
	Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz, Output level≤+4 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+10 dBm (When MG3710A/10E-071/171 is installed),
	≤0.84% (rms) (0.8% (rms) typ.)
	When LTE (20MHz Test Model 3.1) is modulated:
	Output frequency: 600 MHz to 2700 MHz, Output level≤+4 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+10 dBm (When MG3710A/10E-071/171 is installed), ≤0.82% (rms) (0.8% (rms) typ.)
	Output frequency: 3400 MHz to 3800 MHz,
	Output level≤+1 dBm (When MG3710A/10E-071/171 is not installed), Output level≤+7 dBm (When MG3710A/10E-071/171 is installed),
	≤0.82% (rms) (0.8% (rms) typ.)
Carrier leak	MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed Under the conditions of the temperature range between 18°C and 28°C, RMS Value = 0 dB, and after CAL execution.
	≤–55 dBc (100 MHz≤frequency<4 GHz)
	$\leq -45 \text{ dBc}$ (4 GHz \leq frequency)
Image rejection	In MG3710A, MG3710E under the conditions of the temperature range between 18°C and 28°C, RMS Value = 0 dB, after CAL execution, and complex CW at 10MHz or less.
	≤–50 dBc (200 MHz≤frequency<4 GHz)
	$\leq -43 \text{ dBc}$ (4 GHz \leq frequency)
	MG3740A with MG3740A-020/120 installed
	Under the conditions of the temperature range between 18°C and 28°C, RMS Value = 0 dB, after CAL execution, and complex CW at 1 MHz or less.
	\leq -50 dBc (200 MHz \leq frequency<4 GHz)
	$\leq -43 \text{ dBc}$ (4 GHz \leq frequency)

<Vector modulation> Cont'd

Note:

When "E" label is put on the rear panel of MG3710A, the VSG revision number of the corresponding RF is 6 or later, and the performance of MG3710A is equal to that of MG3710E. For how to confirm the revision numbers for VSG1 and VSG2, refer to Board Info in 9.4.3 "Instrument Info".

Items	Specifications
ACLR	Under the conditions of the temperature between 18°C and 28°C and W-CDMA (Test Model 1 64DPCH) signal generation.
1st SG (MG3710A)	When MG3710A-043/143 is not installed:
[When VSG1	300 MHz≤Output frequency<800 MHz,
Revision = 5 or earlier]	Output level≤-2 dBm (When MG3710A-041/141 is not installed), Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level≤-2 dBm (When MG3710A-041/141 is not installed), Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: ≤−71 dBc/3.84 MHz
	10 MHz offset: ≤−71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤-2 dBm (When MG3710A-041/141 is not installed), Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz≤Output frequency<2.2 GHz,
	Output level≤-2 dBm (When MG3710A-041/141 is not installed), Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	2.2 GHz≤Output frequency≤3.0 GHz,
	Output level≤-2 dBm (When MG3710A-041/141 is not installed),
	Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -69 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level≤–2 dBm
	5 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset}: \leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications
ACLR	When MG3710A-043/143 is not installed:
1st SG (MG3710A)	300 MHz≤Output frequency<800 MHz,
[When VSG1	Output level≤–2 dBm (When MG3710A-041/141 is not installed),
Revision = 6 or later]	Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: \leq -68 dBc/3.84 MHz
	10 MHz offset: \leq -70 dBc/3.84 MHz
	800 MHz≤Output frequency<1 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed), Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed),
	Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -69 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset}: \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz≤Output frequency<2.2 GHz,
	Output level ≤ -2 dBm (When MG3710A-041/141 is not installed),
	Output level \leq +5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	2.2 GHz \leq Output frequency \leq 3.0 GHz,
	Output level≤–2 dBm (When MG3710A-041/141 is not installed), Output level≤+5 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: <-65 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	3.0 GHz -Output frequency $\leq 3.8 \text{ GHz}$,
	Output level≤–2 dBm
	$5 \text{ MHz offset:} \leq -63 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: \leq -67 dBc/3.84 MHz
	10 MHZ 0HSet. ≥ -07 uDC/3.04 MHZ

Items	Specifications
ACLR	When MG3710A-043/143 is installed:
1st SG (MG3710A)	300 MHz≤Output frequency<800 MHz,
[When VSG1	Output level≤–5 dBm (When MG3710A-041/141 is not installed),
Revision $= 5$ or	Output level≤+2 dBm (When MG3710A-041/041 is installed),
earlier]	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level -5 dBm (When MG3710A-041/141 is not installed), Output level +2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level = 5 dBm (When MG3710A-041/141 is not installed), Output level = +2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: <-71 dBc/3.84 MHz
	1.8 GHz≤Output frequency<2.2 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed),
	Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	2.2 GHz≤Output frequency≤3.0 GHz,
	Output level \leq -5 dBm (When MG3710A-041/141 is not installed),
	Output level $\leq +2$ dBm (When MG3710A-041/041 is installed),
	$5 \text{ MHz offset:} \leq -69 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	3.0 GHz <output frequency≤3.8="" ghz,<br="">Output level≤–5 dBm</output>
	-
	10 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications
ACLR	When MG3710A-043/143 is installed:
1st SG (MG3710A)	300 MHz≤Output frequency<800 MHz,
[When VSG1	Output level≤–5 dBm (When MG3710A-041/141 is not installed),
Revision = 6 or later]	Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset}: \leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed), Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset}: \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed),
	Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: \leq -69 dBc/3.84 MHz
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	1.8 GHz \leq Output frequency $<$ 2.2 GHz,
	Output level≤–5 dBm (When MG3710A-041/141 is not installed), Output level≤+2 dBm (When MG3710A-041/041 is installed),
	5 MHz offset: \leq -68 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	2.2 GHz \leq Output frequency \leq 3.0 GHz,
	Output level \leq 5 dBm (When MG3710A-041/141 is not installed),
	Output level \leq +2 dBm (When MG3710A-041/041 is installed),
	$5 \text{ MHz offset:} \leq -65 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level≤−5 dBm
	5 MHz offset: ≤ -63 dBc/3.84 MHz
	10 MHz offset: \leq -67 dBc/3.84 MHz

Items	Specifications
ACLR	When MG3710A-073/173 is not installed:
2nd SG (MG3710A)	300 MHz_Output frequency<800 MHz,
[When VSG2	Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),
Revision = 5 or	Output level≤+5 dBm (When MG3710A-071/071 is installed),
earlier]	5 MHz offset: ≤-68 dBc/3.84 MHz
	10 MHz offset: ≤-70 dBc/3.84 MHz
	800 MHz≤Output frequency<1 GHz,
	Output level≤-2 dBm (When MG3710A-071/171 is not installed), Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: \leq -71 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1 GHz <output frequency<1.8="" ghz,<="" td=""></output>
	Output level = 2 dBm (When MG3710A-071/171 is not installed), Output level = +5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: <pre> <-70 dBc/3.84 MHz</pre>
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1.8 GHz≤Output frequency<2.2 GHz,
	Output level≤–2 dBm (When MG3710A-071/171 is not installed),
	Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: \leq -71 dBc/3.84 MHz
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	2.2 GHz≤Output frequency≤3.0 GHz, Output level≤-2 dBm (When MG3710A-071/171 is not installed),
	Output level \leq +5 dBm (When MG3710A-071/071 is installed),
	$5 \text{ MHz offset}: \leq -69 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: <-71 dBc/3.84 MHz
	3.0 GHz Output frequency $\leq 3.8 \text{ GHz}$,
	Output level ≤ -2 dBm
	5 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications
ACLR	When MG3710A-073/173 is not installed:
2nd SG (MG3710A)	300 MHz≤Output frequency<800 MHz,
[When VSG2	Output level≤–2 dBm (When MG3710A-071/171 is not installed),
Revision = 6 or later]	Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level≤–2 dBm (When MG3710A-071/171 is not installed), Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤−71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤–2 dBm (When MG3710A-071/171 is not installed),
	Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: ≤ -69 dBc/3.84 MHz
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	1.8 GHz Output frequency < 2.2 GHz,
	Output level≤–2 dBm (When MG3710A-071/171 is not installed), Output level≤+5 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: \leq -68 dBc/3.84 MHz
	$10 \text{ MHz offset:} \leq -71 \text{ dBc/}3.84 \text{ MHz}$
	2.2 GHz \leq Output frequency \leq 3.0 GHz,
	Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),
	Output level \leq +5 dBm (When MG3710A-071/071 is installed),
	$5 \text{ MHz offset:} \leq -65 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: \leq -71 dBc/3.84 MHz
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level ≤ -2 dBm
	5 MHz offset : $\leq -63 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications
	-
ACLR	When MG3710A-073/173 is installed:
2nd SG (MG3710A)	300 MHz <output frequency<800="" mhz,<="" td=""></output>
[When VSG2	Output level ≤ -5 dBm (When MG3710A-071/171 is not installed),
Revision = 5 or	Output level≤+2 dBm (When MG3710A-071/071 is installed), 5 MHz offset: <-68 dBc/3.84 MHz
earlier]	
	10 MHz offset: ≤ -70 dBc/3.84 MHz
	800 MHz ≤ Output frequency <1 GHz,
	Output level≤-5 dBm (When MG3710A-071/171 is not installed), Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤–5 dBm (When MG3710A-071/171 is not installed),
	Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz≤Output frequency<2.2 GHz
	Output level \leq -5 dBm (When MG3710A-071/171 is not installed),
	Output level≤+2 dBm (When MG3710A-071/071 is installed), 5 MHz offset: <-71 dBc/3.84 MHz
	_
	10 MHz offset: \leq -71 dBc/3.84 MHz
	2.2 GHz≤Output frequency≤3.0 GHz, Output level≤–5 dBm (When MG3710A-071/171 is not installed),
	Output level \leq +2 dBm (When MG3710A 071/171 is not installed), Output level \leq +2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset : $\leq -69 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc/3.84 MHz}$
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level ≤ -5 dBm
	5 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications
ACLR	When MG3710A-073/173 is installed:
2nd SG (MG3710A)	300 MHz≤Output frequency<800 MHz,
[When VSG2	Output level ≤ -5 dBm (When MG3710A-071/171 is not installed),
Revision = 6 or later]	Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤ -70 dBc/3.84 MHz
	800 MHz≤Output frequency<1 GHz, Output level≤–5 dBm (When MG3710A-071/171 is not installed),
	Output level $\leq +2$ dBm (When MG3710A-071/071 is installed),
	5 MHz offset: <-70 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤–5 dBm (When MG3710A-071/171 is not installed),
	Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: \leq -69 dBc/3.84 MHz
	$10 \text{ MHz offset}: \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz Output frequency < 2.2 GHz
	Output level≤–5 dBm (When MG3710A-071/171 is not installed), Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset: \leq -68 dBc/3.84 MHz
	10 MHz offset: ≤ -71 dBc/3.84 MHz
	2.2 GHz \leq Output frequency \leq 3.0 GHz,
	Output level \leq -5 dBm (When MG3710A-071/171 is not installed),
	Output level≤+2 dBm (When MG3710A-071/071 is installed),
	5 MHz offset : $\leq -65 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤−71 dBc/3.84 MHz
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level≤–5 dBm
	5 MHz offset: \leq -63 dBc/3.84 MHz
	10 MHz offset: \leq -67 dBc/3.84 MHz

Items	Specifications
ACLR 1st SG (MG3710E)	Under the conditions of the temperature between 18°C and 28°C and W-CDMA (Test Model 1 64DPCH) signal generation.
	When MG3710E-043/143 is not installed:
	300 MHz≤Output frequency<800 MHz,
	Output level < 2 dBm (When MG3710E-041/141 is not installed),
	Output level≤+5 dBm (When MG3710E-041/041 is installed),
	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level≤-5 dBm (When MG3710E-041/141 is not installed),
	Output level≤+2 dBm (When MG3710E-041/041 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1 GHz≤Output frequency<1.8 GHz,
	Output level \leq -5 dBm (When MG3710E-041/141 is not installed),
	Output level \leq +2 dBm (When MG3710E-041/041 is installed),
	5 MHz offset : $\leq -69 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz \leq Output frequency $<$ 2.2 GHz,
	Output level≤-2 dBm (When MG3710E-041/141 is not installed), Output level≤+5 dBm (When MG3710E-041/041 is installed),
	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤−71 dBc/3.84 MHz
	2.2 GHz≤Output frequency≤3.0 GHz,
	Output level≤–2 dBm (When MG3710E-041/141 is not installed),
	Output level≤+5 dBm (When MG3710E-041/041 is installed),
	$5 \text{ MHz offset:} \leq -65 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level≤−2 dBm
	5 MHz offset : $\leq -63 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤–67 dBc/3.84 MHz

<vector< th=""><th>modulation></th><th>Cont'd</th></vector<>	modulation>	Cont'd
---	-------------	--------

Items	Specifications
ACLR	When MG3710E-043/143 is installed:
1st SG (MG3710E)	300 MHz≤Output frequency<800 MHz, Output level≤-5 dBm (When MG3710E-041/141 is not installed), Output level≤+2 dBm (When MG3710E-041/041 is installed),
	5 MHz offset: <-68 dBc/3.84 MHz
	10 MHz offset: \leq -70 dBc/3.84 MHz
	800 MHz≤Output frequency<1 GHz, Output level≤-5 dBm (When MG3710E-041/141 is not installed), Output level≤+2 dBm (When MG3710E-041/041 is installed),
	5 MHz offset: ≤-70 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz, Output level≤-5 dBm (When MG3710E-041/141 is not installed), Output level≤+2 dBm (When MG3710E-041/041 is installed), 5 MHz offset: ≤-69 dBc/3.84 MHz 10 MHz offset: ≤-71 dBc/3.84 MHz 1.8 GHz≤Output frequency<2.2 GHz, Output level≤-5 dBm (When MG3710E-041/141 is not installed), Output level≤-5 dBm (When MG3710E-041/041 is installed), S MHz offset: ≤-68 dBc/3.84 MHz
	10 MHz offset: ≤-71 dBc/3.84 MHz 2.2 GHz≤Output frequency≤3.0 GHz, Output level≤-5 dBm (When MG3710E-041/141 is not installed), Output level≤+2 dBm (When MG3710E-041/041 is installed), 5 MHz offset: ≤-65 dBc/3.84 MHz
	10 MHz offset: ≤-71 dBc/3.84 MHz 3.0 GHz <output frequency≤3.8="" ghz,<br="">Output level≤-5 dBm</output>
	$ \begin{array}{rll} 5 \ \mathrm{MHz} \ \mathrm{offset}^{:} & \leq -63 \ \mathrm{dBc}/3.84 \ \mathrm{MHz} \\ 10 \ \mathrm{MHz} \ \mathrm{offset}^{:} & \leq -67 \ \mathrm{dBc}/3.84 \ \mathrm{MHz} \end{array} $

Items	Specifications
ACLR	When MG3710E-073/173 is not installed:
2nd SG (MG3710E)	300 MHz≤Output frequency<800 MHz, Output level≤-2 dBm (When MG3710E-071/171 is not installed),
	Output level \leq +5 dBm (When MG3710E-071/071 is installed),
	5 MHz offset: ≤-68 dBc/3.84 MHz 10 MHz offset: ≤-70 dBc/3.84 MHz
	_
	800 MHz≤Output frequency<1 GHz, Output level≤-2 dBm (When MG3710E-071/171 is not installed), Output level≤+5 dBm (When MG3710E-071/071 is installed),
	5 MHz offset : $\leq -70 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤-71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level≤-2 dBm (When MG3710E-071/171 is not installed), Output level≤+5 dBm (When MG3710E-071/071 is installed),
	5 MHz offset : $\leq -69 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -71 \text{ dBc}/3.84 \text{ MHz}$
	1.8 GHz≤Output frequency<2.2 GHz, Output level≤-2 dBm (When MG3710E-071/171 is not installed), Output level≤+5 dBm (When MG3710E-071/071 is installed),
	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset : $\leq -71 \text{ dBc/3.84 MHz}$
	$2.2 \text{ GHz} \leq \text{Output frequency} \leq 3.0 \text{ GHz},$
	Output level ≤ -2 dBm (When MG3710E-071/171 is not installed), Output level $\leq +5$ dBm (When MG3710E-071/071 is installed),
	5 MHz offset : $\leq -65 \text{ dBc}/3.84 \text{ MHz}$
	10 MHz offset: ≤-71 dBc/3.84 MHz
	3.0 GHz <output frequency≤3.8="" ghz,<br="">Output level≤−2 dBm</output>
	5 MHz offset : $\leq -63 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -67 \text{ dBc/3.84 MHz}$

<vector< th=""><th>modulation></th><th>Cont'd</th></vector<>	modulation>	Cont'd
---	-------------	--------

Items	Specifications
ACLR	When MG3710E-073/173 is installed:
2nd SG (MG3710E)	300 MHz_Output frequency<800 MHz,
	Output level = 5 dBm (When MG3710E-071/171 is not installed), Output level = +2 dBm (When MG3710E-071/071 is installed),
	5 MHz offset : $\leq -68 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset}: \leq -70 \text{ dBc}/3.84 \text{ MHz}$
	800 MHz≤Output frequency<1 GHz,
	Output level = 5 dBm (When MG3710E-071/171 is not installed), Output level = +2 dBm (When MG3710E-071/071 is installed),
	5 MHz offset: \leq -70 dBc/3.84 MHz
	10 MHz offset: ≤−71 dBc/3.84 MHz
	1 GHz≤Output frequency<1.8 GHz,
	Output level = 5 dBm (When MG3710E-071/171 is not installed), Output level = +2 dBm (When MG3710E-071/071 is installed),
	5 MHz offset: <69 dBc/3.84 MHz
	10 MHz offset: ≤−71 dBc/3.84 MHz
	1.8 GHz≤Output frequency<2.2 GHz
	Output level \leq -5 dBm (When MG3710E-071/171 is not installed),
	Output level≤+2 dBm (When MG3710E-071/071 is installed),
	5 MHz offset: <-68 dBc/3.84 MHz
	10 MHz offset: \leq -71 dBc/3.84 MHz
	2.2 GHz≤Output frequency≤3.0 GHz, Output level≤–5 dBm (When MG3710E-071/171 is not installed),
	Output level \leq +2 dBm (When MG3710E-071/071 is installed),
	5 MHz offset: <-65 dBc/3.84 MHz
	10 MHz offset : $\leq -71 \text{ dBc}/3.84 \text{ MHz}$
	3.0 GHz <output frequency≤3.8="" ghz,<="" td=""></output>
	Output level≤−5 dBm
	5 MHz offset : $\leq -63 \text{ dBc}/3.84 \text{ MHz}$
	$10 \text{ MHz offset:} \leq -67 \text{ dBc}/3.84 \text{ MHz}$

Items	Specifications		
Level error from CW during vector modulation	Under the conditions of the temperature between 18°C and 28°C and AWGN signal of bandwidth = 5 MHz.		
1st SG (MG3710A/10E)	When MG3710A/10E -043/143 is not installed:		
	Output level <-5 dBm:		
	±0.3 dB (50 MHz≤Output frequency<98 MHz) Output level<+1 dBm:		
	±0.2 dB (98 MHz≤Output frequency≤3 GHz)		
	±0.2 dB (3 GHz <output frequency≤6="" ghz)<="" td=""></output>		
	When MG3710A/10E -043/143 is installed:		
	Output level <5 dBm:		
	±0.3 dB (50 MHz≤Output frequency<98 MHz)		
	Output level<-2 dBm		
	±0.2 dB (98 MHz≤Output frequency≤3 GHz)		
	±0.2 dB (3 GHz <output frequency≤6="" ghz)<="" td=""></output>		
2nd SG (MG3710A/10E)	When MG3710A/10E -073/173 is not installed:		
	Output level <-5 dBm:		
	±0.3 dB (50 MHz≤Output frequency<98 MHz)		
	Output level<+1 dBm:		
	±0.2 dB (98 MHz≤Output frequency≤3 GHz)		
	±0.2 dB (3 GHz <output frequency≤6="" ghz)<="" td=""></output>		
	When MG3710A/10E -073/173 is installed:		
	Output level <5 dBm:		
	±0.3 dB (50 MHz≤Output frequency<98 MHz)		
	Output level<–2 dBm		
	±0.2 dB (98 MHz≤Output frequency≤3 GHz)		
	±0.2 dB (3 GHz <output frequency≤6="" ghz)<="" td=""></output>		

Items	Specifications		
	opeemedations		
IQ input/output	MORTON MORTOF MORTON 'I MORTON OROLINO' / II I		
Base band IQ adjustment	MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed		
DC offset function	Range: -20.000% to +20.000%		
	Resolution: 0.025%		
Gain balancing function	Range: -1.000 dB to +1.000 dB		
	Resolution: 0.001 dB		
IQ adjustment function	Range: -10.00 deg to +10.00 deg		
	Resolution: 0.01 deg		
IQ Phase adjustment function	Range: –360.00 deg to +360.00 deg		
	Resolution: 0.01 deg		
IQ Skew adjustment function	Range: -800.000 ns to +800.000 ns		
	Resolution: 1 ps		
IQ Delay adjustment function	Range: -400.000 ns to +400.000 ns		
	Resolution: 1 ps		
IQ input	When MG3710A/10E-018/118 is installed:		
Modulation bandwidth	Base band 80 MHz (Nominal)		
	RF 160 MHz (Nominal)		
Input level	$\sqrt{(I^2+Q^2)} = 85 \text{ mV} \text{ (rms)}$ (optimum value of level accuracy)		
DC offset function	Range: -100 mV to 100 mV		
	Resolution: 1 mV		
Input connector	Connector: Front panel, BNC-J connector (I Input, Q Input)		
	Maximum input level: −1 V (peak)≤I, Q≤+1 V (peak)		
	Impedance: 50Ω (Nominal)		

Items	Specifications		
IQ output	When MG3710A/10E-018/118 is installed:		
Output voltage range	Under open circuit output conditions, with output voltage amplitude +DC offset: -2.5 V to +5 V		
DC offset function	Under an open circuited output conditions		
	-	offset Range: Resolution:	-2.5 V to 5 V 2 mV
	Differential	DC offset Range: Resolution:	-50 mV to 50 mV 0.1 mV
IQ adjustment function	Uses Baseband IQ adjustment function		
Output connector Connector: Rear panel, BNC-J connector (I Output/Ī Output)		put/\overline{I} Output, Q Output/ \overline{Q}	
	Impedance:	$50 \ \Omega$ (Nominal)	

<Vector modulation> Cont'd

<Arbitrary waveform generator>

Items	Specifications
Waveform resolution	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
	I/Q is 14, 15, or 16 bits
Modulation bandwidth	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
	MG3710A/10E:160 MHz Bandwidth
	MG3740A: 2 MHz Bandwidth
	(Over sampling rate = 4 ,
	the maximum number of Sampling rate = 8 MHz)
Reconstruction filter	In MG3710A, MG3710E or MG3740A with MG3740A-020/120 installed
	80 MHz
Base band level	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
adjustment	Input level adjustment capability of the quadrature modulator. (RMS Value Tuning)
	Decreasing a level leads to less distortion.
	Increasing a level leads to less floor noise.
	Adjustable range $\pm 8 \text{ dB}$
	Resolution 0.01 dB
Marker output	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
	In case of 14 bit resolution
	Three signals among waveform patterns or three signals generated in real-time.
	In case of 15 bit resolution
	One signal among waveform patterns or three signals generated in real-time.
	In case of 16 bit resolution
	Three signals generated in real-time.
	Toggling between positive logic pulse output and negative logic pulse output is available.

<Arbitrary waveform generator> Cont'd

Items	Specifications			
Internal Baseband Reference clock signal	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed			
Range	20 kHz to 200 MHz			
Resolution	0.001 Hz			
External Baseband Reference clock signal	When MG3710A/10E-017/117 is installed:			
Range	20 kHz to 50 MHz			
Divisional and multiplication function	A clock that is generated internally by multiplying the input frequency by 1, 2, 4, 8, 16, 1/2, 1/4, 1/8, and 1/16 can be used as the DAC sampling clock.			
Input connector	Rear panel, BNC-J con	nnector (BB REF CLK	Input)	
Input level	$\geq 0.2 \text{ Vp-p/50 } \Omega \text{ (AC coupling) (Nominal)}$			
Others	Function of External Input or MIMO connection (BB Ref Sync) is selectable.			
Waveform memory	When the Memory synthesizing function is installed, both 1 ch and 2 ch must have the same capacity. A combination of different capacities is not available.			
Memory capacity: 1st SG	MG3710A/10E/40A -045/145	MG3710A/10E -046/146	Memory capacity	
	Not installed	Not installed	64 Msamples	
	Installed	Not installed	256 Msamples	
	Not installed	Installed	1024 Msamples	
Memory capacity: 2nd SG	MG3710A/10E/40A -075/175	MG3710A/10E -076/176	Memory capacity	
	Not installed	Not installed	64 Msamples	
	Installed	Not installed	256 Msamples	
	Not installed	Installed	1024 Msamples	
Number of loadable files	The following numbers of waveform patterns are available per wave memory: 4096 packages/wave memory 4096 patterns/package The maximum number of patterns in total: 4096/wave memory The minimum number of samples per pattern: 128			
Memory synthesizing function				
1st SG	When MG3710A/10E/40A-048/148 is installed, this function synthesizes the contents of two channel memories to generate a baseband waveform.			
2nd SG			this function synthesizes ate a baseband waveform.	

Items	Specifications		
Frequency offset	In MG3710A, MG3710E: ± (200 MHz × 0.8 – Wave form data bandwidth)/2 at the maximum When MG3740A-020/120 is installed: ± (8 MHz × 0.8 – Wave form data bandwidth)/2 at the maximum		
Sequence function	 In MG3710A, MG3710E or MG3740A with MG3740A-020/120 installed The following functions can be executed by selecting combination files. Selecting a pattern switching method (manual or auto) Selecting a pattern switching position (the termination of a frame or the termination of a pattern) When the switching method is set to manual, the pattern can be switched upon the receipt of an external trigger signal. Sequence restart function. Maximum number of elements: 200 Minimum number of points per pattern: 1000 Level ratio setting range level difference between two signals <80 dB or OFF Level setting resolution 0.01 dB Frequency offset 		
Pattern trigger	Frequency setting resolution 1 Hz In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed When the pattern for the functional sequence mode is used, the pattern can be switched upon receipt of an external trigger.		
Input connector	Connector: Either of BNC-J connector (Start Frame TRIG Input, Pattern TRIG1 Input) or AUX connector on the rear panel can be used. Input level: TTL Logic: The polarity of rising or falling edge can be selected.		
Trigger Input	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed Starts outputting waveform pattern in sync with trigger signal.		
Start trigger Frame trigger	Starts outputting waveform pattern in sync with trigger signal. Start trigger or frame trigger is alternatively selectable. Used to start a waveform generation. In the burst waveform generation mode, this function is used to determine the timing of burst signal generation.		
Trigger event	The following trigger events can be detected. No Retrigger/Buffered Trigger/Restart on Trigger		
Input connector	Function switching: Start trigger or frame trigger can be selected at the connector. Connector: Either of BNC-J connector (Start Frame TRIG Input, Pattern TRIG1 Input) or AUX connector can be used. Input level: TTL Logic: The polarity of rising or falling edge can be selected.		

<Arbitrary waveform generator> Cont'd

<AWGN generating function>

Items	Specifications
AWGN generating function	
1 st SG	When MG3710A/10E-049/149 is installed:
	Absolute value of CN ratio: ≤40 dB
2nd SG	When MG3710A/10E-079/179 is installed:
	Absolute value of CN ratio≤40 dB
Band restriction filter	When MG3710A/10E-049/079/149/179 is installed:
	The band restriction of AWGN can be set in the following range.
	From 20% to 80% of waveform sampling rate

<Sweep/List function>

Items	Specifications
Sweep function List function	Frequency and level sweep can be set at 1000-point resolution. Sweeping points of both frequency and level can be set individually to 500 points.

Appendix A Specifications

Items	Specifications
	When MG3710A/10E/40A-021/121 is installed:
Connector	Connector: Rear panel, AUX Connector
	Input level: TTL
Input signal	Data, Clock, Enable
Input bit rate	100 bps to 40 Mbps
Measurable patterns	PN,9, PN,1, PN,5, PN,0, PN,3, AL,0, AL,1, Repeat of "01"
	PN9fix, PN11fix, PN15fix, PN20fix, PN23fix, User Define
Synchronization establishing condition	
PN signal	PN order \times 2 bits error free
PNfix signal	Establish the synchronization with PN signal by PN order × 2 bits error free, and then establish the synchronization with PNfix signal from the start bit of PNfix signal by PN order error free.
ALL0, ALL1, repetition of 01	10 bit error free
UserDefine	8 to 1024 bit (variable) error free
	A start bit to be used for detection of synchronization can also be selected.
Re-synchronization judgment	x/y:y = number of measurement bit:selectable among500, 5000 and 50000x = number of error bits among y bits:selectable in the
M 1.1. h.'.	range from 1 to y/2
Measurable bit Number of measurable	$\leq 2^{32}-1$ bit $\leq 2^{32}-1$ bit
error bits	$\leq 2^{32} - 1$ bit
Measurement end condition	Number of measurement bits, number of measurement error bits
Automatic re-synchronization function	Can be toggled on and off.
Operation of re-synchronization	Can be selected Count Clear or Count Keep.
Measurement mode	Single, Endless, Continuous
Display	Status, Error, Error Rate, Error Count, SyncLoss Count, number of measurement bits
Alternating polarity function	Polarity of Data, Clock and/or Enable can be alternatively switched.
Measurement result clearing function	This function can start the measurement from 0 by clearing the measurement values while keeping synchronization during the BER measurement.

<BER measurement function>

<Connector>

Items	Specifications
Output connector (RF Output)	Refer to <output connector=""> for details.</output>
Output connector (2nd RF Output)	When MG3710A/10E/40A- 062/064/066/162/164/166 is installed: Refer to <output connector=""> for details.</output>
Analog IQ input	When MG3710A/10E-018/118 is installed:
(I Input) (Q Input)	Refer to <vector modulation="">, IQ input for details.</vector>
Analog IQ output	When MG3710A/10E-062/064/066/162/164/166 is installed:
(I Input/I Input) (Q Input/Q Input)	Refer to <vector modulation="">, IQ output for details.</vector>
External reference	
input (REF Input)	
Connector	Rear panel, BNC-J, 50 Ω (Nominal)
Frequency	5 MHz/10 MHz/13 MHz
Operating range	±1 ppm
Input level	$-15 \text{ dBm} \le \text{level} \le +20 \text{ dBm}$, (AC coupling)
Reference signal	
output (Deffer Oest est)	
(Buffer Output)	$\mathbf{P}_{\mathbf{r}}$
Connector Frequency	Rear panel, BNC-J, 50 Ω (Nominal) 10 MHz
Output level	$\geq 0 \text{ dBm (AC coupling)}$
Start Frame TRIG Input	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
Connector	Rear panel, BNC-J connector
Output level	TTL
Marker1 Output	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
Connector	Rear panel, BNC-J connector
Output level	TTL
Pattern TRIG1 Input	In MG3710A, MG3710E, or MG3740A with MG3740A-020/120 installed
Connector	Rear panel, BNC-J connector
Input level	TTL
BB REF CLK Input	When MG3710A/10E-017/117 is installed:
Connector	Rear panel, BNC-J, 50 Ω (Nominal)
Frequency	20 kHz to 50 MHz (for External Baseband Reference clock)
T (1 1	560 MHz to 800 MHz (for BB Ref Sync)
Input level	$\geq 0.2 \text{ Vp-p}$, (Nominal) (AC coupling)
BB REF CLK Output	When MG3710A/10E-017/117 is installed:
Connector Frequency	Rear panel, BNC-J, 50 Ω (Nominal) 560 MHz to 800 MHz
Output level	0.8 Vp-p, (Nominal) (AC coupling)
Output level	o.o vp p, (nominal) (AC coupling)

Appendix A Specifications

<Connector> Cont'd

Items	Specifications
Sweep Output	When MG3710A/10E/40A-017/117 is installed:
Connector	BNC-J at < 1 Ω (driving capability of up to 2 k Ω) on the rear panel
Output level	0 to 10 V (while 10V level sweep is being executed), 0/5 V (when Sweep Status is selected)
LO Input	When MG3710A/10E-017/117 is installed:
Connector	Rear panel, SMA-J, 50 Ω (Nominal)
Frequency	98 MHz to 6 GHz
Input level	−10 dBm ≤ level ≤ +1 dBm (Nominal) (AC coupling)
LO Output	When MG3710A/10E-017/117 is installed
Connector	Rear panel, SMA-J, 50 Ω (Nominal)
Frequency	98 MHz to 6 GHz
Output level	≤+1 dBm (Nominal) (AC coupling) (Internal Lo output)
Additional Analog Modulation Input	When MG3710A/10E/40A-050/080/150/180 is installed:
Connector	Rear panel, BNC-J
Input impedance	50 $\Omega,600~\Omega,\mathrm{or}$ Hi-Z (100 k $\Omega/70$ pF) (Nominal)
Input level	For set value, 2 Vp-p (Nominal) Absolute maximum ratings: ±5 V
Remote control	Remote control functions from an external controller (excluding the power supply)
LAN	Ethernet (10/100/1000 Base-T)
Connector	Rear panel, RJ-45
GPIB	Compatible with IEEE488.2
Connector	IEEE488 bus connector on the rear panel
Interface	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2
function	
USB (B)	Compatible with USB2.0
Connector	Rear panel. USB-B Connector
USB	Compatible with USB2.0
	Waveform hardcopy and parameter saving of this equipment onto USB compatible external devices are available.
Connector	Two ports of USB-A Connector on each of front panel and rear panel.
Monitor Output	
Connector	VGA compatible mini D-SUB 15 pin on the rear panel
AUX	Used for input/output of an auxiliary device when MG3710A/10E/40A-017/117/021/121 is installed.
Connector	Rear panel, 50 pins (DX10A-50S equivalent part) An AUX-BNC conversion cable is attached when MG3710A/10E/40A-017/117/021/121 is installed.
Input/Output level	TTL

<Display>

Items	Specifications
Display	XGA color LCD (resolution 1024×768)
	8.4 inches (213 mm)

<General specification>

Items	Specifications
Dimensions and mass	
Dimensions	177 mm (h) \times 426 mm (w) \times 390 mm (d) (excluding protrusions)
Mass	${\leq}13.7$ kg (with MS3710A/10E/40A-032,034 or 036 installed; excludes all other options)
	≤17 kg (with all options installed; MG3710A/10E-001, -002, -011, -017, -018, -021, -036, -041, -042, -043, -046, -048, -049, -050, -066, -071, -072, -073, -076, -078, -079, or MG3740A-001, -002, -011, -017, -020, -021, -036, -041, -042, -043, -045, -048, -050, -066, -071, -072, -073, -075, -078, -080)
Power supply	
Rated power voltage	AC 100 V to 120 V or 200 V to 240 V *
Rated frequency	50 to 60 Hz
Power consumption	$\leq 350 \text{ VA}$ (Including all options)
	180VA (Nominal) (Including the following options but excluding other options: MG3710A/10E/40A-032, 034 or 036, and 041)
	260VA (Nominal) (Including the following options but excluding other options: MG3710A/10E/40A-032, 034 or 036, 041, and 042; and MG3710A/10E/40A-062, 064 or 066, 071, and 072)
	280VA (Nominal) (Including the following options but excluding other options: MG3710A/10E/40A-032, 034 or 036, 041, and 042; MG3710A/10E/40A-062, 064 or 066, 071, and 072; and 001, 021)
Temperature	
Operating	$5 \text{ to } 45^{\circ} \text{C}$
temperature	
Storage	-20 to 60°C
temperature	

*: Operating voltage: within the range of +10% to -15% from the rated voltage

Appendix A Specifications

<Environment performance>

Items	Specifications
Conducted interference	Conforms to EN 61326-1
Radiated interference	Conforms to EN 61326-1
Harmonic current emission	Conforms to EN 61000-3-2
Electrostatic Discharge	Conforms to EN 61326-1
Electromagnetic immunity	Conforms to EN 61326-1
First transient/burst	Conforms to EN 61326-1
Surge	Conforms to EN 61326-1
RF Conductive Immunity	Conforms to EN 61326-1
Power Frequency Magnetic Field Immunity	Conforms to EN 61326-1
Voltage drop / power supply interruption	Conforms to EN 61326-1

A.2 Options

<Option 001 Rubidium Reference Oscillator /

Option 101 Rubidium Reference Oscillator Retrofit >

Items	Specifications
Model/Symbol	MG3710A-001, MG3710E-001, MG3740A-001 Rubidium Reference Oscillator MG3710A-101, MG3710E-101, MG3740A-101 Rubidium Reference Oscillator Retrofit
Intended Use	This option generates 10 MHz reference signal to enhance frequency stability. Refer to <frequency>, Internal Rubidium Reference Oscillator for details.</frequency>

<Option 002 High Stability Reference Oscillator /

Option 102 High Stability Reference Oscillator Retrofit>

Items	Specifications
Model/Symbol	MG3710A-002, MG3710E-002, MG3740A-002 High Stability Reference Oscillator MG3710A-102, MG3710E-102, MG3740A-102 High Stability Reference Oscillator Retrofit
Intended Use	This option generates 10 MHz reference signal to enhance frequency stability. Refer to <frequency>, Internal Rubidium Reference Oscillator for details.</frequency>

<Option 011 2ndary HDD /Option 111 2ndary HDD Retrofit >

Items	Specifications
Model/Symbol	MG3710A-011, MG3710E-011, MG3740A-011 2ndary HDD MG3710A-111, MG3710E-111, MG3740A-111 2ndary HDD Retrofit
Intended Use	Adds a removable HDD for storage of user data.

Appendix A Specifications

<Option 017 Universal Input/Output /Option 117 Universal Input/Output Retrofit>

Items	Specifications
Model/Symbol	MG3710A-017, MG3710E-017, MG3740A-017
	Universal Input/Output
	MG3710A-117, MG3710E-117, MG3740A-117
	Universal Input/Output Retrofit
Intended Use	Supplies the following interfaces.
	MG3710A, MG3710E:
	The interface for local signal synchronization to realize MIMO
	function
	Sweep Out signal
	AUX-BNC conversion cable.
	MG3740A:
	Sweep Out signal
	AUX-BNC conversion cable.

<Option 018 Analog IQ Input/Output /Option 118 Analog IQ Input/Output Retrofit >

Note:

This option cannot be installed in MG3740A.

Items	Specifications
Model/Symbol	MG3710A-018, MG3710E-018 Analog IQ Input/Output MG3710A-118, MG3710E-118
	Analog IQ Input/Output Retrofit
Intended Use	Adds the analog I/Q input/output function. Refer to <iq input="" output="">, IQ input, IQ output for details.</iq>

<Option 020 Digital Modulation /Option 120 Digital Modulation Retrofit >

Note:

This option cannot be installed in MG3710A, MG3710E.

Items	Specifications
Model/Symbol	MG3740A-020 Digital Modulation MG3740A-120 Digital Modulation Retrofit
Intended Use	Adds the digital modulation function to the analog signal generator.Refer to <vector modulation=""> for details.</vector>

<Option 021 BER Test Function /Option 121 BER Test Function Retrofit >

Items	Specifications
Model/Symbol	MG3710A-021, MG3710E-021, MG3740A-021 BER Test Function
	MG3710A-121, MG3710E-121, MG3740A-121 BER Test Function Retrofit
Intended Use	Adds the BER measurement function.
	Refer to <ber function="" measurement=""> for details.</ber>

<Option 029 OS Upgrade to Windows 7>

Items	Specifications
Model/Symbol	MG3710A-029, MG3740A-029 OS Upgrade to Windows 7
Intended Use	Upgrades OS to Windows 7 Professional.
	According to the license restriction, this product is available only as a factory option.

<Option 032 1st RF 100 kHz to 2.7 GHz>

Items	Specifications
Model/Symbol	MG3710A-032, MG3710E-032, MG3740A-032 1st RF 100kHz to 2.7GHz
	This option cannot be retrofitted.
Intended Use	Supplies a specific 1st RF frequency range.
	Refer to <frequency> for details.</frequency>

<Option 034 1st RF 100 kHz to 4 GHz>

Items	Specifications
Model/Symbol	MG3710A-034, MG3710E-034, MG3740A-034 1st RF 100kHz to 4GHz This option cannot be retrofitted.
Intended Use	Supplies a specific 1st RF frequency range. Refer to <frequency> for details.</frequency>

<Option 036 1st RF 100 kHz to 6 GHz>

Items	Specifications
Model/Symbol	MG3710A-036, MG3710E-036, MG3740A-036 1st RF 100kHz to 6GHz
	This option cannot be retrofitted.
Intended Use	Supplies a specific 1st RF frequency range.
	Refer to <frequency> for details.</frequency>

Appendix A Specifications

<Option 041 High Power Extension for 1st RF /

Option 141 High Power Extension for 1st RF Retrofit>

ltems	Specifications
Model/Symbol	MG3710A-041, MG3710E-041, MG3740A-041 High Power Extension for 1st RF MG3710A-141, MG3710E-141, MG3740A-141 High Power Extension for 1st RF Retrofit
Intended Use	Extends the maximum 1st RF output level. Refer to <output level=""> for details.</output>

<Option 042 Low Power Extension for 1st RF /

Option 142 Low Power Extension for 1st RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-042, MG3710E-042, MG3740A-042 Low Power Extension for 1st RF
	MG3710A-142, MG3710E-142, MG3740A-142 Low Power Extension for 1st RF Retrofit
Intended Use	Extends the minimum 1st RF output level.
	Refer to <output level=""> for details.</output>

<Option 043 Reverse Power Protection for 1st RF /

Option 143 Reverse Power Protection for 1st RF Retrofit >

Items	Specifications
Model/Symbol	MG3710A-043, MG3710E-043, MG3740A-043 Reverse Power Protection for 1st RF
	MG3710A-143, MG3710E-143, MG3740A-143
	Reverse Power Protection for 1st RF Retrofit
Intended Use	Protects 1st RF from damage due to reverse power input.
	Refer to <maximum input="" reverse=""> for details.</maximum>

<Option 045 ARB Memory Upgrade 256 Msample for 1st RF /

Option 145 ARB Memory Upgrade 256 Msample for 1st RF Retrofit >

Items	Specifications
Model/Symbol	MG3710A-045, MG3710E-045, MG3740A-045 ARB Memory Upgrade 256 Msample for 1st RF MG3710A-145, MG3710E-145, MG3740A-145 ARB Memory Upgrade 256 Msample for 1st RF Retrofit
Intended Use	Expands the ARB memory capacity of 1st RF to 256 M. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 046 ARB Memory Upgrade 1024 Msample for 1st RF /

Option 146 ARB Memory Upgrade 1024 Msample for 1st RF Retrofit >

Note:

This option cannot be installed in MG3740A.

Items	Specifications
Model/Symbol	MG3710A-046, MG3710E-046 ARB Memory Upgrade 1024 Msample for 1st RF
	MG3710A-146, MG3710E-146, ARB Memory Upgrade 1024 Msample for 1st RF Retrofit
Intended Use	Expands the ARB memory capacity of 1st RF to 1024 M. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 048 Combination of Baseband Signal for 1st RF /

Option 148 Combination of Baseband Signal for 1st RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-048, MG3710E-048, MG3740A-048 Combination of Baseband Signal for 1st RF MG3710A-148, MG3710E-148, MG3740A-148 Combination of Baseband Signal for 1st RF Retrofit
Intended Use	Adds the memory synthesizing function for synthesizing signals in the 1st RF baseband. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 049 AWGN for 1st RF /Option 149 AWGN for 1st RF Retrofit>

Note:

This option cannot be installed in MG3740A.

Items	Specifications
Model/Symbol	MG3710A-049, MG3710E-049 AWGN for 1st RF
	MG3710A-149, MG3710E-149 AWGN for 1st RF Retrofit
Intended Use	Adds the AWGN function to the 1st RF.
	Refer to <awgn function="" generating=""> for details.</awgn>

Appendix A Specifications

<Option 050 Additional Analog Modulation Input for 1st RF /

Option 150 Additional Analog Modulation Input for 1st RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-050, MG3710E-050, MG3740A-050 Additional Analog Modulation Input for 1st RF
	MG3710A-150, MG3710E-150, MG3740A-150
	Additional Analog Modulation Input for 1st RF Retrofit
Intended Use	Adds the additional analog modulation function for 1st RF.
	Refer to <analog modulation="">, External modulation signal for details.</analog>

<Option 062 2nd RF 100kHz to 2.7GHz /

Option 162 2nd RF 100kHz to 2.7GHz Retrofit>

Items	Specifications
Model/Symbol	MG3710A-062, MG3710E-062, MG3740A-062 2nd RF 100kHz to 2.7GHz MG3710A-162, MG3710E-162, MG3740A-162 2nd RF 100kHz to 2.7GHz Retrofit
	This option can be retrofitted only when 2nd RF is not installed.
Intended Use	Supplies a specific 2nd RF frequency range.
	Refer to <frequency> for details.</frequency>

<Option 064 2nd RF 100kHz to 4GHz /Option 164 2nd RF 100kHz to 4GHz Retrofit>

Items	Specifications
Model/Symbol	MG3710A-064, MG3710E-064, MG3740A-064 2nd RF 100kHz to 4GHz MG3710A-164, MG3710E-164, MG3740A-164
	2nd RF 100kHz to 4GHz Retrofit
	This option can be retrofitted only when 2nd RF is not installed.
Intended Use	Supplies a specific 2nd RF frequency range.
	Refer to <frequency> for details.</frequency>

<Option 066 2nd RF 100kHz to 6GHz /Option 166 2nd RF 100kHz to 6GHz Retrofit>

Items	Specifications
Model/Symbol	MG3710A-066, MG3710E-066, MG3740A-066 2nd RF 100kHz to 6GHz MG3710A-166, MG3710E-166, MG3740A-166 2nd RF 100kHz to 6GHz Retrofit
	This option can be retrofitted only when 2nd RF is not installed.
Intended Use	Supplies a specific 2nd RF frequency range.
	Refer to <frequency> for details.</frequency>

<Option 071 High Power Extension for 2nd RF /

Option 171 High Power Extension for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-071, MG3710E-071, MG3740A-071 High Power Extension for 2nd RF MG3710A-171, MG3710E-171, MG3740A-171 High Power Extension for 2nd RF Retrofit
Intended Use	Extends the maximum 2nd RF output level. Refer to <output level=""> for details.</output>

<Option 072 Low Power Extension for 2nd RF /

Option 172 Low Power Extension for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-072, MG3710E-072, MG3740A-072 Low Power Extension for 2nd RF
	MG3710A-172, MG3710E-172, MG3740A-172 Low Power Extension for 2nd RF Retrofit
Intended Use	Extends the minimum 2nd RF output level. Refer to <output level=""> for details.</output>

<Option 073 Reverse Power Protection for 2nd RF /

Option 173 Reverse Power Protection for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-073, MG3710E-073, MG3740A-073 Reverse Power Protection for 2nd RF
	MG3710A-173, MG3710E-173, MG3740A-173 Reverse Power Protection for 2nd RF Retrofit
Intended Use	Protects 2nd RF from damage due to reverse power input. Refer to <maximum input="" reverse=""> for details.</maximum>

<Option 075 ARB Memory Upgrade 256 Msample for 2nd RF /

Option 175 ARB Memory Upgrade 256 Msample for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-075, MG3710E-075, MG3740A-075 ARB Memory Upgrade 256 Msample for 2nd RF MG3710A-175, MG3710E-175, MG3740A-175 ARB Memory Upgrade 256 Msample for 2nd RF Retrofit
Intended Use	Expands the ARB memory capacity of 2nd RF to 256 M. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 076 ARB Memory Upgrade 1024 Msample for 2nd RF /

Option 176 ARB Memory Upgrade 1024 Msample for 2nd RF Retrofit>

Note:

This option cannot be installed in MG3740A.

Items	Specifications
Model/Symbol	MG3710A-076, MG3710E-076 ARB Memory Upgrade 1024 Msample for 2nd RF MG3710A-176, MG3710E-176 ARB Memory Upgrade 1024 Msample for 2nd RF Retrofit
Intended Use	Expands the ARB memory capacity of 2nd RF to 1024 M. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 078 Combination of Baseband Signal for 2nd RF /

Option 178 Combination of Baseband Signal for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-078, MG3710E-078, MG3740A-078 Combination of Baseband Signal for 2nd RF MG3710A-178, MG3710E-178, MG3740A-178 Combination of Baseband Signal for 2nd RF Retrofit
Intended Use	Adds the memory synthesizing function for synthesizing signals in the 2nd RF baseband. Refer to <arbitrary generator="" waveform="">, Waveform memory for details.</arbitrary>

<Option 079 AWGN for 2nd RF /Option 179 AWGN for 2nd RF Retrofit>

Note:

This option cannot be installed in MG3740A.

Items	Specifications	
Model/Symbol	MG3710A-079, MG3710E-079 AWGN for 2nd RF	
	MG3710A-179, MG3710E-179 AWGN for 2nd RF Retrofit	
Intended Use	Adds the AWGN function to the 2nd RF.	
	Refer to <awgn function="" generating=""> for details.</awgn>	

<Option 080 Additional Analog Modulation Input for 2nd RF /

Option 180 Additional Analog Modulation Input for 2nd RF Retrofit>

Items	Specifications
Model/Symbol	MG3710A-080, MG3710E-080, MG3740A-080 Additional Analog Modulation Input for 2nd RF MG3710A-180, MG3710E-180, MG3740A-180 Additional Analog Modulation Input for 2nd RF Retrofit
Intended Use	Adds the additional analog modulation function for 2nd RF. Refer to <analog modulation="">, External modulation signal for details.</analog>

<Option 181 CPU/Windows7 Upgrade Retrofit>

Items	Specifications	
Model/Symbol	MG3710A-181, MG3740A-181 CPU/Windows7 Upgrade Retrofit	
Intended Use	Upgrades the COM-Express module and changes the OS to Windows Embedded Standard 7 (64-bit) (WES 7).	

<Option 182 CPU/Windows10 Upgrade Retrofit>

Items	Specifications	
Model/Symbol	MG3710A-182, MG3710E-182, MG3740A-182 CPU/Windows10 Upgrade Retrofit	
Intended Use	Upgrades the COM-Express module and changes the OS to Windows 10 IoT (Win 10).	

<Option 313 Removable HDD>

Items	Specifications	
Model/Symbol	MG3710A-313, MG3740A-313 Removable HDD	
Intended Use	A HDD as an additional main storage medium (including OS) Users should attach or detach their HDD by themselves.	

B.1 Error Messages List.....B-2

ID	Message	Description	
-1	Operation is canceled		
-100	Command error	Failed to analyze command syntax.	
-108	Parameter not allowed	Received more-than-required number of parameters for header.	
-109	Missing parameter	Received less-than-required number of parameters for header.	
-113	Undefined header	Undefined program header.	
-120	Numeric data error	Failed to analyze numeric data syntax.	
-120	Character data error	Failed to analyze character data syntax.	
-130	Suffix error	Failed to analyze suffix syntax.	
-150	String data error	Failed to analyze string data syntax.	
-160	Block data error	Failed to analyze block data syntax.	
-200	Execution error		
-200	Execution error Failed to save. Number of files to be saved reached upper limit.		
-200	Execution error No selectable waveform pattern in waveform memory.		
-200	Execution error	License error	
-200	Execution error	License Version error	
-200	Execution error		
-200	Execution error Operation disabled because Long pattern is included.		
-200			
-200	Execution error	Operation disabled when Pattern Combination is Edit.	
-200	Execution error	I/Q Calibration failed.	
-200	Execution error	Cannot load waveform.	
-200			
-200	Execution error	The number of waveform on memory A reached upper limit.	
-200	Execution error	The number of waveform on memory B reached upper limit.	
-200	Execution error	The number of Long pattern on memory reached upper limit.	
-200	Execution error	There is insufficient space on memory A.	
-200	Execution error	There is insufficient space on memory B.	

B-2

ID	Message	Description	
-200	Execution error	There is insufficient space on memory to load Long pattern.	
-200	Execution error	The waveform already exists on memory A.	
-200	Execution error	The waveform already exists on memory B.	
-200	Execution error	The same Long pattern already exists on memory.	
-200	Execution error	Cannot load with current condition.	
-200	Execution error	Operation forbidden as long as the current function is being executed.	
-200	Execution error	Option composition of parameter file is not the same.	
-221	Settings conflict	Setting not supported for 1st SG.	
-221	Settings conflict	Setting not supported for 2nd SG.	
-221	Settings conflict	Operation disabled when SG type is Analog.	
-221	Settings conflict	Operation disabled when I/Q Output is Analog I/Q Out.	
-221	Settings conflict	Operation disabled when I/Q Source is Digital I/Q In.	
-221	Settings conflict	Operation disabled when Modulation Source is Ext.	
-221	Settings conflict	Operation disabled when Modulation Source is Int.	
-221	Settings conflict	Operation disabled when Output Frequency is under 7MHz.	
-221	Settings conflict	Operation disabled when Sequence Mode is being executed.	
-221	Settings conflict	Operation disabled when Sweep/List is being executed.	
-221	Settings conflict	Operation disabled when High S/N is On.	
-221	Settings conflict	Operation disabled with current level setting. Increase level to turn on this function.	
-221	Settings conflict	Operation disabled when Channel A is Off.	
-221	Settings conflict	Operation disabled when Channel B is Off.	
-221	Settings conflict	Operation disabled when SyncWithSG is Off.	
-221	Settings conflict	Operation disabled when no channel group is loaded to channel table.	
-221	Settings conflict	Operation disabled when Frequency Type differs between SG1 and SG2.	
-221	Settings conflict	Operation disabled when FreqType is Channel.	
-221	Settings conflict	Operation disabled when AttHold is On.	
-221	Settings conflict	Operation disabled when SyncWithSG is On.	
-221	Settings conflict	Operation disabled when LO Source is not Internal.	
-221	Settings conflict	Operation disabled when SG2 LO Source is Sync.	

ID	Message	Description	
-221	Settings conflict	Operation restricted by Multi SG Sync.	
-221	Settings conflict	Operation disabled when Pattern Combination is Edit.	
-221	Settings conflict	Operation disabled when Digital Modulation (Opt-020) not installed.	
-221	Settings conflict	Parameter out of range or invalid: [Comment]Line	
-221	Settings conflict	Parameter out of range or invalid: [Header]Product Name	
-221	Settings conflict	Parameter out of range or invalid: [Header]Soft Type	
-221	Settings conflict	Parameter out of range or invalid: [Wave Info]Data Width	
-221	Settings conflict	Operation disabled when Combination Pattern File or Alias Pattern File not selected.	
-221	Settings conflict	Operation disabled when Pattern B is not selected.	
-221	Settings conflict	Operation disabled when Pattern A is not selected.	
-221	Settings conflict	Operation disabled when both Pattern A and B is not selected.	
-221	Settings conflict	Operation disabled when Off not set for Sync Type.	
-221	Settings conflict	Operation disabled when Sync Type is Secondary.	
-221	Settings conflict	Operation disabled when External not set for Baseband Reference Clock Source.	
-221	Settings conflict	Operation disabled when Marker1 Edit Mode A is Off.	
-221	Settings conflict	Operation disabled when Marker2 Edit Mode A is Off.	
-221	Settings conflict	Operation disabled when Marker3 Edit Mode A is Off.	
-221	Settings conflict	Operation disabled when On not set for Marker1 Edit Mode A.	
-221	Settings conflict	Operation disabled when On not set for Marker2 Edit Mode A.	
-221	Settings conflict	Operation disabled when On not set for Marker3 Edit Mode A.	
-221	Settings conflict	Operation disabled when RF Gate Edit Mode is Off.	
-221	Settings conflict	Operation disabled when On not set for RF Gate Edit Mode.	
-221	Settings conflict	Operation disabled when Play Mode is Auto for Sequence Mode.	
-221	Settings conflict	Operation disabled when Sequence Mode is not being executed.	
-221	Settings conflict	Operation disabled because Primary or Secondary not set for Sync Type.	
-221	Settings conflict	Operation disabled when Secondary not set for Sync Type.	
-221	Settings conflict	Operation disabled when Sync Type is Off.	
-221	Settings conflict	Operation disabled when Waveform Pattern is not included in output signal.	

ID	Message	Description	
-221	Settings conflict	Operation disabled when Sequence Pattern File is selected.	
-221	Settings conflict	Operation disabled when Carrier is not included in output signal.	
-221	Settings conflict	Operation disabled when Carrier is included in output signal.	
-221	Settings conflict	Operation disabled when Marker1 Edit Mode B is Off.	
-221	Settings conflict	Operation disabled when Marker2 Edit Mode B is Off.	
-221	Settings conflict	Operation disabled when Marker3 Edit Mode B is Off.	
-221	Settings conflict	Operation disabled when On not set for Marker1 Edit Mode B.	
-221	Settings conflict	Operation disabled when On not set for Marker2 Edit Mode B.	
-221	Settings conflict	Operation disabled when On not set for Marker3 Edit Mode B.	
-221	Settings conflict	Operation disabled when Pattern A and B is not included in output signal.	
-221	Settings conflict	Operation disabled with currently selected Waveform Pattern File.	
-221	Settings conflict	Operation disabled when Combination Pattern File or Alias Pattern File not selected.	
-221	Settings conflict	Operation disabled when Waveform of List function is On when List function in use.	
-221	Settings conflict	Operation disabled when Rate Matching is used.	
-221	Settings conflict	Operation disabled when RfGateType is Single.	
-221	Settings conflict	Operation disabled when Start/Frame Trigger is Off.	
-221	Settings conflict	Operation disabled when Start/Frame Trigger Mode is Start.	
-221	Settings conflict	Operation disabled when 3Trigger not set for Pattern Trigger Mode.	
-221	Settings conflict	Operation disabled when Pattern Trigger Mode is 3Status.	
-221	Settings conflict	Operation disabled when outputting Pattern A and B addition signal or Multiplex signal	
-221	Settings conflict	Operation disabled when Center Signal is Baseband DC.	
-221	Settings conflict	Operation disabled when Baseband DC not set for Center Signal.	
-221	Settings conflict	Operation disabled when Long pattern is loaded.	
-221	Settings conflict	Operation disabled when Mod is On.	
-221	Settings conflict	Operation disabled when SG1 output signal is CW.	
-221	Settings conflict	Operation disabled when SG2 output signal is CW.	
-221	Settings conflict	Invalid waveform type	
-221	Settings conflict	Invalid waveform file information	
-221	Settings conflict	Same combination file has been loaded.	

ID Message Description		Description	
-221	Settings conflict	Cannot find waveform A specified with combination.	
-221	Settings conflict	Cannot find waveform B specified with combination.	
-221	Settings conflict	Invalid waveform A file information	
-221	Settings conflict	Invalid waveform B file information	
-221	Settings conflict	The number of combination file reached upper limit.	
-221	Settings conflict	Cannot load new waveform when Long waveform is already loaded.	
-221	Settings conflict	Cannot load new Long waveform when more than one waveform is already loaded.	
-221	Settings conflict	Operation disabled when AM Type is Exp.	
-221	Settings conflict	Operation disabled when AM Type is Lin.	
-221	Settings conflict	Operation disabled when Square not set for Pulse Source.	
-221	Settings conflict	Operation disabled when Freerun or Gated not set for Pulse Source.	
-221	Settings conflict	Operation disabled when Pulse Source is Square or Ext Pulse.	
-221	Settings conflict	Operation disabled when Pulse Source is Square, Freerun, Gated, or Ext Pulse.	
-221	Settings conflict	Operation disabled when Adjustable Doublet not set for Pulse Source.	
-221	Settings conflict	Operation disabled when I/Q Source is Analog I/Q In.	
-221	Settings conflict	Operation disabled when SG output signals are not modulated.	
-221	Settings conflict	Operation disabled when Sequence Pattern File is selected.	
-221	Settings conflict	Operation disabled in Manual Mode.	
-221	Settings conflict	Operation disabled when using 2nd SG and in Sweep mode.	
-221	Settings conflict	Specified function not supported at current state.	

ID	Message	Description	
-222	Data out of range	Setting value out of range	
-240	Hardware error	Failed to communicate with Power Sensor.	
-241	Hardware missing	Operation disabled when both Option 018 and Option 019 not installed.	
-241	Hardware missing	Operation disabled when Digital BB I/Q Unit (Opt-019) not installed.	
-241	Hardware missing	Operation disabled when 2nd SG (Opt-062, 064, 066) not installed.	
-241	Hardware missing	Operation disabled when Reverse Power Protection for 1st RF (Opt-043) not installed.	
-241	Hardware missing	Operation disabled when Reverse Power Protection for 2nd RF (Opt-073) not installed.	
-241	Hardware missing	Deration disabled when Option 048 not installed.	
-241	Hardware missing	Operation disabled when Option 078 not installed.	
-241	Hardware missing	Operation disabled when Universal Input/Output (Opt-017) not installed.	
-241	Hardware missing	Operation disabled when AWGN (Opt-049) not installed.	
-241	Hardware missing	Operation disabled when AWGN (Opt-079) not installed.	
-241	Hardware missing	Operation disabled when 2nd HDD (Opt-011) not installed.	
-241	Hardware missing	Operation disabled when Analog I/Q Input/Output (Opt-018) not installed.	
-241	Hardware missing	Operation disabled when 1st SG (Opt-050) not installed.	
-241	Hardware missing	Operation disabled when 2nd SG (Opt-080) not installed.	
-256	File name not found	Unable to execute; specified file name not found in media.	
-257	File name error	An invalid filename was encountered.	
-350	Queue overflow	Remote control error queue overflowed.	

The default values are common to SG Port 1 and 2, if not specified.

<System>

Item	Default
SG Port	SG1

<Frequency Functions>

Item	Default
Frequency setting	
Frequency	1 GHz
Frequency relative display On/Off	Off
Frequency relative display	0 Hz
Frequency offset On/Off	Off
Frequency offset	0 Hz
Frequency offset multiplier On/Off	Off
Frequency offset multiplier	1
Frequency step	100.00000 kHz
Channel setting	
Frequency/Channel display	Freq
Frequency display On/Off	Off
Channel group	No Group
Channel selection	0
Function	
Frequency synchronization On/Off	Off
Frequency synchronization mode	Parallel
Phase noise optimization	Offset < 200 kHz
RF spectrum	Normal
Signal source	
Reference frequency source	Auto
Reference frequency	10 MHz
Local signal source	Int
Local signal output	Off
Local signal phase	0.00 deg

<Output Level Main Function>

ltem	Default
Output	
RF output On/Off	Off
Output level	-144.00 dBm
Display unit	dBm
Output level relative display On/Off	Off
Output level relative value	0 dB
Output level offset On/Off	Off
Output level offset	0.00 dB
Output level step	0.10 dB
Limit level On/Off	Off
Limit level	Maximum level of installed options
Function	
ATT Hold On/Off	Off
Output level synchronization On/Off	Off
User correction On/Off	Off
S/N optimization On/Off	Off
User correction setting	
Com Port	2
Model	MA24106A
Start Freq	1.0000000000 GHz
Stop Freq	1.0000000000 GHz
Level Offset On/Off	Off
Level Offset	0.00 dB
Correction Points	2
Averaging On/Off	Off
Averaging Count	10

<Sweep/List Function>

Item	Default
Sweep	· ·
Sweep/List Freq On/Off	Off
Sweep/List Level On/Off	Off
Sweep/List Type	Sweep
Sweep repeat	Continuous
Sweep Direction	Up
Manual Mode On/Off	Off
Manual Point	1
Output setting	!
Sweep Out setting	Sweep Status
Trigger Out Polarity	Positive
Sweep function setting	!
Sweep start frequency	1.0000000000 GHz
Sweep stop frequency	1.0000000000 GHz
Sweep center frequency	1 GHz
Sweep span frequency	0 Hz
Sweep start level	-144.00 dBm
Sweep stop level	-144.00 dBm
Sweep point	101
Sweep dwell time	2.000 ms
Sweep type	Saw Tooth
List function setting	
List SG setting	SG1
List frequency setting	1 GHz
List level setting	-144.00 dBm
Dwell time selection	List
Point trigger	
Point trigger On/Off	Off
Point trigger mode	Start
Point trigger source	External
Point trigger delay	0.00000000 s
Point trigger edge	Rise
Point trigger timer	1.000 ms

<Modulation Function>

Item	Default
Modulation	1
Modulation On/Off	Off
Analog/Pulse modulation	1
AM Modulation On/Off	Off
AM Depth scale	Linear
AM Depth (Lin)	0.1%
AM Depth (Log)	3.00 dB
AM modulation frequency	400.0 Hz
Switching AM Source	Int
AM Waveform	Sine
AM Phase Adjust	0 deg
FM Modulation On/Off	Off
FM frequency deviation	1.0000 kHz (SG1)
	0 Hz (SG2)
FM modulation frequency	400.0 Hz
Switching FM Source	Int
FM Waveform	Sine
FM Phase Adjust	0 deg
φM Modulation On/Off	Off
φM deviation angle	0.000 rad
φM modulation frequency	400.0 Hz
Switching ϕ M Source	Int
φM Waveform	Sine
φM Phase Adjust	0 deg
Pulse Modulation On/Off	Off
Pulse modulation source	Freerun
Pulse modulation frequency	400.0 Hz
Pulse modulation period	4.00 µs
Pulse modulation delay	0.00000000 s
Pulse modulation width	2.00 µs
Pulse 2 delay	0.00000000 s
Pulse 2 width	2.00 µs
Pulse Sync/Pulse Video output signal polarity	Positive
Pulse Mod input signal polarity	Positive
External Modulation Signal	
Coupling	DC
Impedance	600 Ω

ltem	Default
Optimize function for the analog modu	lation
Optimize	Spurious (MG3710A/MG3710E) Distortion (MG3740A)
Digital modulation	
ARB On/Off	On
RMS adjustment	0.00 dB
Pattern generation mode	Defined
ARB Setup	-
Pattern A On/Off	On
Pattern B On/Off	Off
Pattern A output level	-144.00 dBm
Pattern B output level	-144.00 dBm
Object of level change	A&B
Level ratio setting	0.00 dB
Sampling rate A	20.000000 kHz
Sampling rate B	20.000000 kHz
Frequency offset	0 Hz
Frequency offset A	0 Hz
Frequency offset B	0 Hz
Reference frequency	Baseband DC
Start offset	0
Spectrum reverse A	Normal
Spectrum reverse B	Normal
Waveform load	
Waveform load list focus	Package
Sub item	Status
Waveform load target memory	А
Waveform selection	
Waveform selection list focus	Package
Waveform selection target memory	А
Waveform copy	
Waveform copy list focus	Package
Waveform copy target drive	C:

Item	Default
RF Gate	
RF Gate On/Off	On
RF Gate edit On/Off	Off
RF Gate line	Single
RF Gate offset 1	0.00
RF Gate width 1	1.00
RF Gate offset 2	0.00
RF Gate width 2	1.00
RF Gate frequency	1.00
Start/Frame Trigger	
Start/Frame Trigger On/Off	Off
Start/Frame Trigger Mode	Start
Start/Frame Trigger Source	Ext
Start/Frame Trigger Delay	0.00
Start/Frame Trigger Edge	Rise
Start/Frame Trigger Event	No Retrigger
Baseband Clock	
Baseband Reference Clock Source	Int
Baseband Reference Clock Division	1/4
Baseband Reference Clock Out	Off
Maker Setup	
Marker1 Edit Mode A On/Off	Off
Marker1 Offset A	0.00
Marker1 Width A	1.00
Marker1 Cycle A	1.00
Marker1 Polarity A	Positive
Marker1 Edit Mode B On/Off	Off
Marker1 Offset B	0.00
Marker1 Width B	1.00
Marker1 Cycle B	1.00
Marker1 Polarity B	Positive
Marker2 Edit Mode A On/Off	Off
Marker2 Offset A	0.00
Marker2 Width A	1.00
Marker2 Cycle A	1.00
Marker2 Polarity A	Positive
Marker2 Edit Mode B On/Off	Off
Marker2 Offset B	0.00
Marker2 Width B	1.00
Marker2 Cycle B	1.00

Item	Default
Marker2 Polarity B	Positive
Marker3 Edit Mode A On/Off	Off
Marker3 Offset A	0.00
Marker3 Width A	1.00
Marker3 Cycle A	1.00
Marker3 Polarity A	Positive
Marker3 Edit Mode B On/Off	Off
Marker3 Offset B	0.00
Marker3 Width B	1.00
Marker3 Cycle B	1.00
Marker3 Polarity B	Positive
Sequence Mode	
Sequence Play Mode	Auto
Sequence Repeat Mode	Continuous
Sequence Element Repeat Count	1
Sequence Element Number	1
Pattern Trigger On/Off	Off
Pattern Trigger 1 On/Off	Off
Pattern Trigger 1 Source	Ext
Pattern Trigger 1 Edge	Rise
Pattern Trigger 2 On/Off	Off
Pattern Trigger 2 Source	Ext
Pattern Trigger 2 Edge	Rise
Pattern Trigger 3 On/Off	Off
Pattern Trigger 3 Source	Ext
Pattern Trigger 3 Edge	Rise
Pattern Trigger Switching Point	Pattern
Sync Multi SG	
Sync Type	Off
Number of Secondaries	1
Secondary Position	1
LO Sync	Off
I/Q Phase	0.00 deg
I/Q Delay	0.00000000000 s

<Route Connectors>

Item	Default
Route Input Connectors	·
S/F Trigger	SG1 S/F Trigger (MG3710A, MG3710E, MG3740A-020/120) OFF (When MG3740A-020/120 is not installed)
Pattern Trigger 1	Pattern Trigger 1 (MG3710A, MG3710E, MG3740A-020/120) OFF (When MG3740A-020/120 is not installed)
Pattern Trigger 2	Pattern Trigger 2
Pattern Trigger 3	Pattern Trigger 3
Pattern Status 1	Pattern Status 1
Pulse Mod	SG1 Pulse Mod
Pattern Trigger Type	Shared
Route Output Connectors	· · ·
Marker1	SG1 Marker1 A (MG3710A, MG3710E, MG3740A-020/120) Point Trigger Out (When MG3740A-020/120 is not installed)
Marker2	SG1 Marker2 A
Marker3	SG1 Marker3 A
Pulse Video	SG1 Pulse Video
Pulse Sync	SG1 Pulse Sync
Sync Trig Out	Sync Trigger Out

<AWGN>

Item	Default
AWGN	
AWGN On/Off	Off
Noise Bandwidth	16.000 kHz
Carrier Level	-110.00 dBm
Noise Level	-20.00 dBm
C/N Ratio	40.00 dB
C/N Set Signal	Constant

<I/Q Modulation>

ltem	Default
I/Q	
I/Q Source	Internal
I/Q Output	RF
Internal Channel Correction	Off
I/Q Calibration	
Cal Type	DC
Wideband	Off
Analog I/Q Input Adjustments	·
I Offset	0.000 V
Q Offset	0.000 V
Analog I/Q Output Adjustments	·
I Level Trimming	100.0%
Q Level Trimming	100.0%
I/Q Common Offset	0.0000 V
I Diff Offset	0.0000 V
Q Diff Offset	0.0000 V
Internal Baseband Adjust	
I Offset	0.000%
Q Offset	0.000%
Gain Balance	0.000 dB
Quad. Angle	0.00 deg
I/Q Phase	0.00 deg
I/Q Skew	0.00000000000 s
I/Q Delay	0.00000000000 s

<BER Measurement Functions>

Item	Default
BER	·
Measure Mode	Continuous
Data Type	PN9
Count Mode	
Count Mode	Data
Data	1000
Error	1
Resync Condition	
Auto Resync	On
Threshold X	200
Threshold Y	500 bits
at SyncLoss	Clear
BER Interface	
Clock Edge	Rise
Data Polarity	Positive
Enable Active	Disable
PN Fix Pattern	
PN Fix9 Pattern Initial	1FF
PN Fix11 Pattern Initial	7FF
PN Fix15 Pattern Initial	7FFF
PN Fix20 Pattern Initial	FFFFF
PN Fix23 Pattern Initial	7FFFFF
PN Fix Pattern Length	96
User Defined Pattern	
Pattern Length	1024
Sync Start	1
Sync Length	32
Auto Restart	
Auto Restart	Off

<Power Meter>

ltem	Default
Channel A On/Off	Off
Channel B On/Off	Off
Connection Settings	
Channel A Com Port	2
Channel A Model	MA24106A
Channel B Com Port	2
Channel B Model	MA24106A
Channel Settings	
Channel A Freq	1.00000000000 GHz
Channel A Offset On/Off	Off
Channel A Offset	0.00 dB
Channel A Averaging On/Off	Off
Channel A Averaging Count	1024
Channel A Measurement Units	dBm
Channel B Freq	1.00000000000 GHz
Channel B Offset On/Off	Off
Channel B Offset	0.00 dB
Channel B Averaging On/Off	Off
Channel B Averaging Count	1024
Channel B Measurement Units	dBm

<Utility>

Item	Default
Interface Settings	
GPIB Address	3
Terminator	CR
Language	SCPI
Raw Socket Port Number	49158
System Settings	
Beep Sound	On
Power On	Last

<Other Functions>

ltem	Default
Сору	
File Type	PNG
Color	Normal
Others	
Screen display On/Off	On
Knob hold On/Off	Off

<Save/Read Function>

Item	Default
Saving/reading media	С

Appendix D Performance Test Report Form

Performance Test Result Form

Test Location	Report No.	
	Date	
	Test person in charge	
Equipment Name:MG3710A, MG3710E Vector Signal	Generator/MG3	3740A Analog Signal Generator
Serial No.	Ambient temperature	°C
Power frequency	Relative humidity	%
Remarks:		

Appendix D Performance Test Report Form

Output Frequency (Section 10.2.1)

1st RF

Setting	Results
0.009 MHz	\Box OK \Box NG
$100 \mathrm{~MHz}$	\Box OK \Box NG
300 MHz	\Box OK \Box NG
$600 \mathrm{~MHz}$	\Box OK \Box NG
$1000 \mathrm{~MHz}$	\Box OK \Box NG
$1500~\mathrm{MHz}$	\Box OK \Box NG
2000 MHz	\Box OK \Box NG
$2500~\mathrm{MHz}$	\Box OK \Box NG
$2700 \mathrm{~MHz}$	\Box OK \Box NG
3000 MHz	\Box OK \Box NG
$3500 \mathrm{~MHz}$	\Box OK \Box NG
$4000 \mathrm{~MHz}$	\Box OK \Box NG
4500 MHz	□ OK □ NG
$5000 \mathrm{~MHz}$	\Box OK \Box NG
$5500~\mathrm{MHz}$	\Box OK \Box NG
$6000 \mathrm{~MHz}$	\Box OK \Box NG

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.
4500 to 6000 MHz are available only when the Upper frequency

limit 6 GHz option is installed.

Setting	Re	sults
$0.009 \mathrm{~MHz}$	□ OK	\Box NG
$100 \mathrm{~MHz}$	□ OK	\Box NG
$300 \mathrm{~MHz}$	□ OK	\Box NG
$600 \mathrm{~MHz}$	□ OK	\Box NG
$1000 \mathrm{~MHz}$	□ OK	\Box NG
$1500 \mathrm{~MHz}$	□ OK	\Box NG
$2000 \mathrm{~MHz}$	□ OK	\Box NG
$2500~\mathrm{MHz}$	□ OK	\Box NG
$2700 \mathrm{~MHz}$	□ OK	\Box NG
$3000 \mathrm{~MHz}$	□ OK	\Box NG
$3500 \mathrm{~MHz}$	□ OK	\Box NG
$4000 \mathrm{~MHz}$	□ OK	\Box NG
$4500 \mathrm{~MHz}$	□ OK	\Box NG
$5000 \mathrm{~MHz}$	□ OK	\Box NG
$5500 \mathrm{~MHz}$	□ OK	\Box NG
$6000 \mathrm{~MHz}$	□ OK	\Box NG

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.

2nd RF

Output Level Frequency Characteristics (Section 10.3.1)

1st RF, without Option 043/143

Setti	ng	Minimum		Maximum	
Frequency	Output level	Rating	Minimum Results Rating		Uncertainty
50 MHz 97 MHz	−5 dBm	–5.5 dBm		-4.5 dBm	±0.27 dB
98 MHz 100 MHz 399 MHz 400 MHz		-7.5 dBm		-6.5 dBm	±0.27 dB
500 MHz 1000 MHz 1500 MHz 2000 MHz 2500 MHz 2700 MHz 3000 MHz	−7 dBm	–7.5 dBm		-6.5 dBm	±0.25 dB
3001 MHz 3500 MHz 4000 MHz		–7.7 dBm		-6.3 dBm	±0.34 dB
4500 MHz 5000 MHz		-7.8 dBm		-6.2 dBm	±0.34 dB
5500 MHz 6000 MHz		-7.8 dBm		-6.2 dBm	±0.34 dB

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.

Setti	ng	Minimum		Maximum	
Frequency	Output level	Rating	Results	Rating	Uncertainty
50 MHz 97 MHz	−5 dBm	–5.5 dBm		-4.5 dBm	±0.27 dB
98 MHz 100 MHz 399 MHz 400 MHz		-7.5 dBm		–6.5 dBm	±0.27 dB
500 MHz 1000 MHz 1500 MHz 2000 MHz 2500 MHz 2700 MHz 3000 MHz	−7 dBm	–7.5 dBm		-6.5 dBm	±0.25 dB
3001 MHz 3500 MHz 4000 MHz	-	–7.7 dBm		-6.3 dBm	±0.34 dB
4500 MHz 5000 MHz		-7.8 dBm		-6.2 dBm	±0.34 dB
5500 MHz 6000 MHz		-7.8 dBm		-6.2 dBm	±0.34 dB

2nd RF, without Option 073/173

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.

Appendix D Performance Test Report Form

Setti	ng	Minima		Maximum	
Frequency	Output level	Rating	Minimum Results Rating		Uncertainty
50 MHz 97 MHz	-8 dBm	-8.5 dBm		–7.5 dBm	±0.27 dB
98 MHz 100 MHz 399 MHz 400 MHz		–10.5 dBm		–9.5 dBm	±0.27 dB
500 MHz 1000 MHz 1500 MHz 2000 MHz 2500 MHz 2700 MHz 3000 MHz	–10 dBm	–10.5 dBm		–9.5 dBm	±0.25 dB
3001 MHz 3500 MHz 4000 MHz		–10.7 dBm		–9.3 dBm	±0.34 dB
4500 MHz 5000 MHz		-10.8 dBm		–9.2 dBm	±0.34 dB
5500 MHz 6000 MHz]	-10.8 dBm		–9.2 dBm	±0.34 dB

1st RF, with Option 043/143

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.

Setti	ng	Minimum		Maximum	
Frequency	Output level	Rating	Results	Rating	Uncertainty
50 MHz 97 MHz	-8 dBm	-8.5 dBm		-7.5 dBm	±0.27 dB
98 MHz 100 MHz 399 MHz 400 MHz		–10.5 dBm		–9.5 dBm	±0.27 dB
500 MHz 1000 MHz 1500 MHz 2000 MHz 2500 MHz 2700 MHz 3000 MHz	—10 dBm	–10.5 dBm		–9.5 dBm	±0.25 dB
3001 MHz 3500 MHz 4000 MHz	-	–10.7 dBm		–9.3 dBm	±0.34 dB
4500 MHz 5000 MHz		-10.8 dBm		–9.2 dBm	±0.34 dB
5500 MHz 6000 MHz		-10.8 dBm		-9.2 dBm	±0.34 dB

2nd RF, with Option 073/173

*: 3000 to 4000 MHz are available only when the Upper frequency limit 4 GHz, 6 GHz option is installed.

Vector Accuracy (Section 10.4.1)

Note:

Waveform patterns are not included in the MG3740A; therefore the vector modulation performance test is not required.

1st RF

	Setting			Maximum	Uncortainty
System	Frequency	Output level	Results	Rating	Uncertainty
W-CDMA (Test Model 4)	800 MHz 900 MHz 1800 MHz 1900 MHz			0.62% (rms)	0.02% (rms)
GSM	800 MHz 900 MHz 1800 MHz 1900 MHz	□ (1) +7 dBm		0.84° (rms)	0.04° (rms)
EDGE	800 MHz 900 MHz 1800 MHz 1900 MHz	□ (2) +13 dBm □ (3) +4 dBm □ (4) +10 dBm		0.84% (rms)	0.04% (rms)
LTE (20 MHz TestModel 3.1)	600 MHz 800 MHZ 1500 MHz 2000 MHz 2400 MHz 2700 MHz			0.82% (rms)	0.02% (rms)
LTE (20 MHz TestModel 3.1)	3400 MHz 3500 MHz 3600 MHz 3700 MHz 3800 MHz	□ (1) +4 dBm □ (2) +10 dBm □ (3) +1 dBm □ (4) +7 dBm		0.82% (rms)	0.02% (rms)

*: Refer to the table below for output level.

Output loval	1st RF : 043/143	1st RF : 041/141	
Output level	2nd RF : 073/173	2nd RF : 071/171	
(1)	Not installed	Not installed	
(2)	Not installed	Installed	
(3)	Installed	Not installed	
(4)	Installed	Installed	

	Setting		Results	Maximum	Uncontainty
System	Frequency	Output level	Results	Rating	Uncertainty
W-CDMA (Test Model 4)	800 MHz 900 MHz 1800 MHz 1900 MHz			0.62% (rms)	0.02% (rms)
GSM	800 MHz 900 MHz 1800 MHz 1900 MHz	□ (1) +7 dBm		0.84° (rms)	0.04° (rms)
EDGE	800 MHz 900 MHz 1800 MHz 1900 MHz	□ (2) +13 dBm □ (3) +4 dBm □ (4) +10 dBm		0.84% (rms)	0.04% (rms)
LTE (20 MHz TestModel 3.1)	600 MHz 800 MHZ 1500 MHz 2000 MHz 2400 MHz 2700 MHz			0.82% (rms)	0.02% (rms)
LTE (20 MHz TestModel 3.1)	3400 MHz 3500 MHz 3600 MHz 3700 MHz 3800 MHz	□ (1) +4 dBm □ (2) +10 dBm □ (3) +1 dBm □ (4) +7 dBm		0.82% (rms)	0.02% (rms)

2nd RF

*: Refer to the table below for output level.

Output loval	1st RF : 043/143	1st RF : 041/141
Output level	2nd RF : 073/173	2nd RF : 071/171
(1)	Not installed	Not installed
(2)	Not installed	Installed
(3)	Installed	Not installed
(4)	Installed	Installed

This chapter provides an overview of the remote control operation of the MG3710A/MG3710E/MG3740A.

E.1	E.1 Overview					
E.2	Connec	ctionE-4				
	E.2.1	GPIB connectionE-5				
	E.2.2	Ethernet connectionE-6				
	E.2.3	USB connectionE-7				
E.3	Interfac	e SettingsE-8				
	E.3.1	GPIB interface settingsE-8				
	E.3.2	Ethernet interface settingsE-9				
	E.3.3	USB interface settings E-17				
E.4	Interfac	e Selection/ChangingE-18				
E.5	Initializa	ationE-19				
E.6	Langua	age ModeE-20				
	E.6.1	Language mode switchingE-20				
E.7	SCPI D	Device Message DetailsE-21				
	E.7.1	SCPI Program message formatsE-21				
	E.7.2	SCPI Response message formatsE-30				
	E.7.3	Structure of SCPI commandE-33				
	E.7.4	Command definition methodE-34				
	E.7.5	Composition of commandsE-35				
	E.7.6	Selecting SG1/2E-35				
E.8	Native	Device Message DetailsE-37				
	E.8.1	Native Program message formatsE-37				
	E.8.2	Native Response message formatsE-44				
	E.8.3	Selecting SG1/2E-47				
E.9	Status	StructureE-48				
	E.9.1	IEEE488.2 standard status modelE-48				
	E.9.2	Status Byte (STB) registerE-50				
	E.9.3	SCPI Device-dependent summary				
		messagesE-51				
	E.9.4	Native Device-dependent summary				
		messagesE-52				
	E.9.5	Reading and clearing STB registerE-53				
	E.9.6	Service Request (SRQ) enable operation E-54				
	E.9.7	Standard Event Status register modelE-56				
	E.9.8	Standard Event Status register operationE-57				
	E.9.9	SCPI Specification Status registerE-57				
	E.9.10	SCPI specification status register operation E-59				
	E.9.11	Extended Event Status registerE-61				

	E.9.12 Extended Error Event Status register	
	(Main Application)	E-62
	E.9.13 Extended End Event Status register	
	(Main Application)	E-63
	E.9.14 Extended Error Event Status register	
	(Sub Application)	E-64
	E.9.15 Extended End Event Status register	
	(Sub Application)	E-65
	E.9.16 Extended Event Status register operation.	E-66
E.10	Synchronization	E-68
E.11	IEEE488.2 Common Device Messages	E-71
	E.11.1 IEEE488.2 Common Device Messages Lis	stE-71
	E.11.2 IEEE488.2 Common Device Messages	
	Details	E-73
E.12	SCPI Device Message	E-84
	E.12.1 OPERation status register	E-84
	E.12.2 SCPI device message details	E-86

E.1 Overview

Automatic measurement can be performed in combination with an external controller (PC). The MG3710A/MG3710E/MG3740A is equipped with GPIB, Ethernet and USB interfaces as standard. The following functions are supported via these interfaces:

- Control of all functions, except for the power switch
- Reading of all the status and settings
- Interrupts and serial polls

Ethernet (1000BASE-T)

An overview of each interface is shown below:

(1) GPIB

(2)

The GPIB interface of the MG3710A/MG3710E/MG3740A conforms to the IEEE488.1/IEEE488.2 standard. The interface functions shown below are supported:

• SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2

For the network connection, refer to 9.7.7 "Windows Security Measures".

The Ethernet interface of the MG3710A/MG3710E/MG3740A can be used as a remote control interface conforming to the VXI-11 protocol using TCP/IP. Control programs can be described using VISA software supporting the VXI-11 protocol. The interface functions shown below are supported:

• SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0 In addition, the Ethernet interface can be controlled by a Raw Socket connection using TCP/IP. Control programs can be described by using the VISA software or a Telnet client supporting Raw Socket connections. Interrupt functions and serial port operation are not supported at Raw Socket connection.

(3) USB

The USB interface of the MG3710A/MG3710E/MG3740A can be used as a remote control interface conforming to the USBTMC-USB488 protocol. Control programs can be described using VISA software supporting the USBTMC-USB488 protocol. The interface functions shown below are supported:

• SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0

E.2 Connection

Connect the MG3710A/MG3710E/MG3740A and an external controller (PC) to be used for remote control using the dedicated connector for the applicable interface on the rear panel. Connection cables are provided as additional parts with the MG3710A/MG3710E/MG3740A.

External controller (PC)

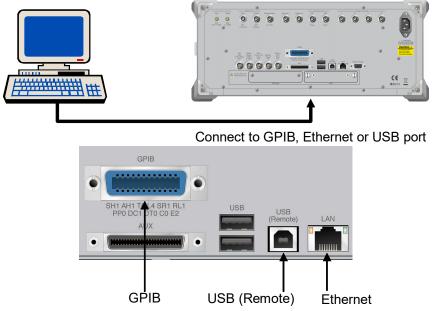


Figure E.2-1 Connection port connecting to external controller (PC)

E.2.1 GPIB connection

Connect the GPIB connector on the rear panel of the MG3710A/MG3710E/MG3740A and an external device using a GPIB cable.

Note:

Be sure to connect the GPIB cable before turning power on to the MG3710A/MG3710E/MG3740A. Connecting it while the power is on may damage internal circuits.

Up to 15 devices, including the external controller (PC), can be connected into one MG3710A/MG3710E/MG3740A. Be sure to abide by the conditions shown below when connecting devices.

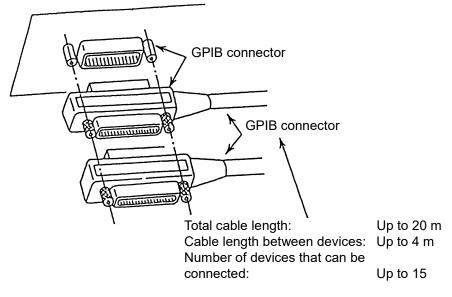


Figure E.2.1-1 GPIB cable connection

E.2.2 Ethernet connection

Connect the Ethernet connector on the rear panel and external devices using LAN cables.

Note:

Check the network settings before LAN connection. The destination LAN may be affected depending on settings.

Use a LAN crossover cable to connect the MG3710A/MG3710E/MG3740A and an external device. Use a network hub when connecting to multiple external devices.

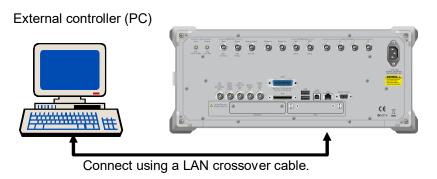


Figure E.2.2-1 Sample connection with one external device

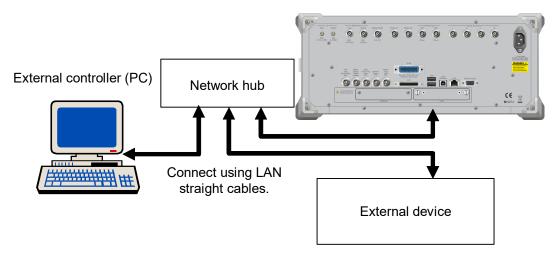


Figure E.2.2-2 Sample connection with multiple external devices

Note:

External devices may experience difficulty in communicating with the MG3710A/MG3710E/MG3740A, depending on the status of communications between them. A LAN crossover-cable connection is recommended to ensure communication stability.

E.2.3 USB connection

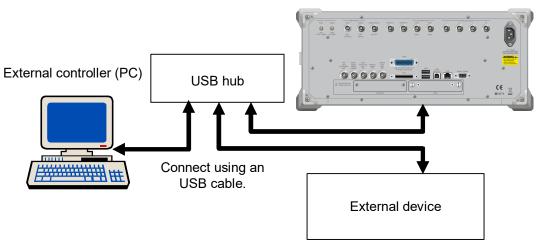
Connect the USB (Remote) connector on the rear panel and external devices using USB cables. The external controller (PC) can be connected to multiple devices via a USB hub, etc.

External controller (PC)



Connect using an USB cable.







E.3 Interface Settings

This section describes setting methods for the MG3710A/MG3710E/MG3740A and the external controller (PC) for remote control. Connecting a mouse or keyboard may be required to perform settings.

E.3.1 GPIB interface settings

- Sets the GPIB Address Refer to 9.4.1 "Interface Setting" for the setting procedure. The Resource Name used during control program description by VISA is as shown below: When the GPIB primary address is 1: GPIB0::1::INSTR
- 2. Sets the terminator (a terminator code). Refer to 9.4.1 "Interface Setting" for how to set it.

E.3.2 Ethernet interface settings

- 1. Sets the terminator (a terminator code). Refer to 9.4.1 "Interface Setting" for how to set it.
- 2. Sets the Raw Socket Port Number.
 - Refer to 9.4.1 "Interface Setting" for how to set it.
- 3. Confirms and configures the network settings of the MG3710A/MG3710E/MG3740A.

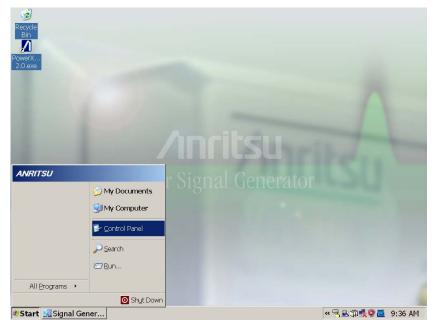
Confirm the IP address, subnet mask, and host name of the Ethernet settings by referring to <How to confirm and set IP address and subnet mask on Windows.> described on the next page.

In case of using Windows VISTA to remotely control MG3710A/MG3710E/MG3740A, the resource name should be described as follows;

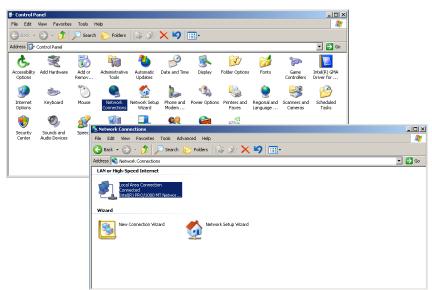
When IP Address = 172.168.0.1: TCPIP::172.168.0.1::INSTR

<How to confirm and set IP address and subnet mask> When the OS is Windows Embedded Standard 2009

 Connect a keyboard. Press the Windows key to open the Start menu and then click Control Panel. (Or connect a mouse and move the pointer to the bottom of the screen by using it to open the Start menu.) The Control Panel window is displayed.



2. On the **Control Panel** window, click **Network Connections** to display the **Network Connections** window. Then click **Local Area Connection** on the **Network Connections** window to display the **Local Area Connection Properties** window.



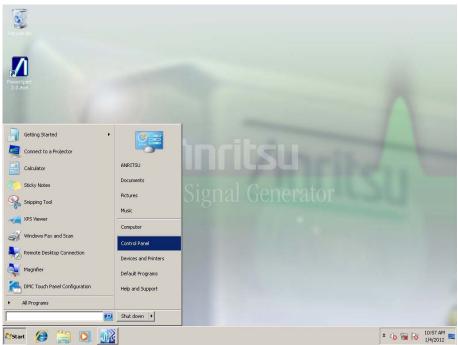
3. On the Local Area Connection Properties window, click Internet Protocol (TCP/IP) to display the Internet Protocol (TCP/IP) Properties window.

Change the settings according to the connection conditions.

Local Area Connection Properties	? X	
General Authentication Advanced		
Connect using:		
Intel(R) PR0/1000 MT Network Conr Config	gure	
This connection uses the following items:		
Client for Microsoft Networks	Internet Protocol (TCP/IP) Properties	? ×
 File and Printer Sharing for Microsoft Networks QoS Packet Scheduler 	General	
Internet Protocol (TCP/IP)	You can get IP settings assigned automatically if your network supports	1
Install Uninstall Prope	this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	
Description Transmission Control Protocol/Internet Protocol. The d	O Obtain an IP address automatically	
wide area network protocol that provides communication	Use the following IP address:	
across diverse interconnected networks.	IP address: 172 . 168 . 0 . 1	
Show icon in notification area when connected	Subnet mask: 255 . 255 . 255 . 0	
Notify me when this connection has limited or no conr	Default gateway: 172 . 168 . 0 . 0	
	C Obtain DNS server address automatically	
OK	Use the following DNS server addresses:	
	Preferred DNS server:	
	Alternate DNS server:	
	Advanced.	· _
	OK Can	cel

When the OS is Windows 7 Professional or Windows Embedded Standard 7

 Press the Windows key on the connected keyboard, and click the Control Panel from the Start menu. The Start menu is also displayed by moving the pointer of the connected mouse to the bottom of the screen. The Control Panel window is displayed.



2. Click Network and Sharing Center in the Control Panel window to display the Network and Sharing Center window. Click Change adapter settings on the upper left to display the Network Connections window.

Right-click the Local Area Connection icon and click Properties to display the Local Area Connection Properties window.

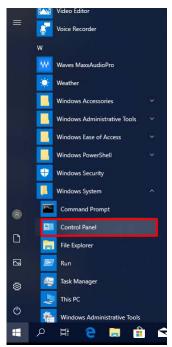
Control Panel +	All Control Panel Items 🕨	✓ 4y Search Control Panel	2
Adjust your computer's set	ttings	View by: Small icons 🔻	
P Action Center	administrative Tools	AutoPlay	
Backup and Restore	🜉 Color Management	Credential Manager	
Pate and Time	👦 Default Programs	📑 Desktop Gadgets	
🚔 Device Manager	B Devices and Printers	🛄 Display	
Ease of Access Center	Folder Options	K Fonts	
🔠 Getting Started	🤣 HomeGroup	🚑 Indexing Options	
💮 Internet Options	🕮 Keyboard	🖾 Location and Other Sensors	
Mouse	Network and Sharing Center	Rotification Area Icons	
🛃 Parental Controls	2 Pen and Touch	Performance Information and Tools	
Personalization			
Programs and Feat	All Control Panel Items > Network	to and Charlos Cartes	ontrol Panel
RemoteApp and D	All Control Panel Items + Networ	rk and Sharing Center - 4, Search Co	ontroi Panei
Windows Anytime Chan	ge adapter settings	🔍 — x — 🎱	See full n
Windows Firewall settin			
Windows Firewall settin	gs (This o	computer) tive networks You are currently not connected to any netv	
	gs (This o	computer) tive networks	vorks.
	igs SNOL (This of View your act	computer) tive networks You are currently not connected to any networks	vorks.
	igs SNOL (This (View your act	computer) tive networks You are currently not connected to any network value of the second	t up a router or acce
	igs SNUL (This: View your act ernet > Network Connections >	computer) tive networks You are currently not connected to any network value of the second	t up a router or acce
	igs SNUL (This: View your act ernet > Network Connections >	computer) tive networks You are currently not connected to any network value of the second	vorks.
	igs SNUL (This: View your act ernet > Network Connections >	computer) tive networks You are currently not connected to any network value of the second	vorks.
Corpanize Corpanize Cocal Ares Connection Network cable unplugg Disable Status Disgnose Bridge Connections Create Shortcut Delete	igs SNUL (This: View your act ernet > Network Connections >	computer) tive networks You are currently not connected to any network value of the second	vorks.
Crganize Corganize Corganize Corganize Cocal Area Connection Network cable unplugg Disable Status Diagnose Bridge Connections Create Shortcut	igs SNUL (This: View your act ernet > Network Connections >	computer) tive networks You are currently not connected to any network value of the second	vorks.

3. Select the Internet Protocol Version 4 (TCP/IPv4) and click Properties to display the Internet Protocol Version 4 (TCP/IPv4) Properties window. Change the setting to meet the conditions of connection.

🖞 Local Area Connectio	on Properties	×
Networking		
Connect using:		
Intel(R) PR0/100	00 PM Network Connection	
	Configure	í l
This connection uses th	ne following items:	
Client for Micro		
QoS Packet S	cheduler r Sharing for Microsoft Networks	
🗹 🛶 Internet Protoc	col Version 6 (TCP/IPv6)	
	col Version 4 (TCP/IPv4) pology Discovery Mapper I/O Driver	
· ·	oology Discovery Responder	
l <u>n</u> stall	Uninstall Properties	
Description		
Transmission Contr wide area network across diverse inte	Internet Protocol Version 4 (TCP/IPv4) Properties
acioss diverse inte	General	
	You can get IP settings assigned auto	omatically if your network supports
	this capability. Otherwise, you need to for the appropriate IP settings.	to ask your network administrator
	Obtain an IP address automatica	ally
	Use the following IP address:	
	IP address:	172.160.1.0
	Sybnet mask:	255.255.255.0
	Default gateway:	172.160.0.0
	Obtain DNS server address auto	omatically
	• Use the following DNS server ad	dresses:
	Preferred DNS server:	
	Alternate DNS server:	· · ·
	Vaļidate settings upon exit	Advanced
		OK Cancel

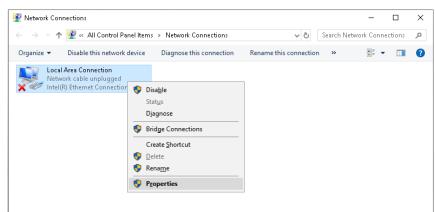
When the OS is Windows 10

 On the keyboard, press the Windows logo key to open the Start menu, and then click Windows System > Control Panel in the W column of the app list displayed. The Control Panel window is displayed.



2. In Control Panel, click **Network and Sharing Center**, and then click **Change adapter settings**.

→ * ↑ 🔜 > Control Panel	 All Control Panel Items 			~ Ū	Search Control Panel 👂			
djust your computer's setting	gs				View by: Large icons 🔻			
Administrative Tools	AutoPlay		Backup and Restore Windows 7)	1	Color Management			
Credential Manager	Date and Time	ت 🌄	Default Programs	a)	Device Manager			
Devices and Printers	Ease of Access (Center 🛛 🛱 F	ile Explorer Options		File History			
Flash Player (32-bit)	Fonts		ndexing Options		Infrared			
Intel® Graphics Setting	s 🛛 🐏 Internet Option:	s 👞 k	Ceyboard	9	Mouse			
Network and Sharing Center	Phone and Mod	lem 🎲 F	Power Options	តិ	Programs and Features	_	0	
Recovery	← → × ↑ 👱 > Control Pan	el > All Control Panel Item	s > Network and Sharing Center		ٽ ~	Search Control Panel		
Sound	Control Panel Home	View your basic net View your active network	work information and set u	p conn	ections			
System	Change adapter settings Change advanced sharing settings	Change your networking	You are currently not connecte	d to any	networks.			
Windows Defender Firewall	Media streaming options		onnection or network oand, dial-up, or VPN connection; or	set up a	router or access point.			
		Troubleshoot p						



3. Right-click Local Area Connection, and then click Properties.

4. In the Local Area Connection Properties dialog box, click Internet Protocol Version 4 (TCP/IP), and then click Properties. In the Internet Protocol Version 4 (TCP/IP) Properties dialog box, change the settings according to the connection conditions.

Local Area Connection Properties Networking Connect using:	×	
Intel(R) Ethernet Connection (7) I219-LM	Configure	
	rks Internet Protocol Version 4 (TCP/IPv4) Properties General	>
✓ Microsoft LLDP Protocol Driver ✓ Internet Protocol/Version 6 (TCP/IPv6) Install Uninstall Description Transmission Control Protocol/Internet Protocol. ¹ Transmission Control Protocol/Internet Protocol. ¹ wide area networks protocol Interprovides commu across diverse interconnected networks.	You can get IP settings assigned automatically if your network support this capability. Otherwise, you need to ask your network administration for the appropriate IP settings. Obtain an IP address automatically © Use the following IP address: IP address: IP address: Subnet mask: 255.255.0 192.168.20.3	
OK.	Default gateway: Obtain DNS server address automatically Use the following DNS server addresses: Preferred DNS server: Alternate DNS server:	
	Validate settings upon exit Advances	d

5. In the Configuration screen, check that the settings have changed.

E.3.3 USB interface settings

Utility or Top> \rightarrow >Utility

- 1. Sets the terminator (a terminator code). Refer to 9.4.1 "Interface Setting" for how to set it.
- 2. Check Vendor ID, Product ID, and Serial Number displayed in the USB(B) Settings field.

Refer to 9.4.3 "Instrument Info" for the setting confirmation procedure. The Resource Name used during control program description by VISA is as shown below:

When Vendor ID = 0x0B5B, Product ID = 0x0006, Serial Number = 123456789:

USB0::0x0B5B::0x0006::123456789::INSTR

E.4 Interface Selection/Changing

The MG3710A/MG3710E/MG3740A supports GPIB, Ethernet and USB as remote control interfaces. Only one of these can be used at once.

The interface to be used is determined automatically according to the communication start command received from the external controller (PC) while in Local status. It enters Remote status when the interface is determined. Remote on the front panel goes off in Local status and lights up in Remote status.

To change the interface, the MG3710A/MG3710E/MG3740A must enter Local status again. Press $\stackrel{\text{Local}}{\longrightarrow}$ on the front panel to enter Local status, then send a command via the desired interface.

E.5 Initialization

Initialization types and targets for the MG3710A/MG3710E/MG3740A are shown in the table below.

Item	IFC	DCL/SDC	Power On	*RST	*CLS
Interface bus initialization	\checkmark	_	\checkmark	_	_
Message exchange initializationInput buffer and output queueMessage processing and status	_	\checkmark	\checkmark	_	_
OPC status initialization	_	\checkmark	\checkmark		\checkmark
Event status initialization	_	_	_	_	\checkmark
Protected settings initialization (Calibration values, Correction values, OS settings, application load/execution status, etc.)	_	_	_	_	_
Initialization of settings saved at power-off	_	-	*	\checkmark	_
Initialization of settings not saved at power-off (window status, measurement results, etc.)	_	_	\checkmark		_

 Table E.5-1
 Initialization level

*: Restores the settings from the last power-off.

(1) IFC (Interface Clear)

٠	Reception of control	l command	IFC from	external	controller (PC)

		(GPIB)
•	create_link request from external controller (PC)	(Ethernet)
•	Establishment of USB2.0 link	(USB)
•	Pressing of [Local] key	

(2) DCL (Device Clear)/SDC (Selectable Device Clear)

- Reception of control command, DCL or SDC, from external controller (PC) (GPIB)
- device_clear request from external controller (PC) (Ethernet)
- Reception of INITIATE_CLEAR from
- external controller (PC) (USB)
- (3) Power On
 - Power-on of the MG3710A/MG3710E/MG3740A
- (4) *RST
- Reception of *RST command (GPIB/Ethernet/USB)
 *CLS
 Reception of *CLS command (GPIB/Ethernet/USB)

E.6 Language Mode

As a command to remotely control the MG3710A/MG3710E/MG3740A, you can select SCPI mode, which is a command format defined by the SCPI Consortium, or compatible modes, in which you can use commands for Anritsu's measuring instruments MG3700A, MG364x, MS269xA, and MS2830A.

• SCPI Mode

This is a command format defined by the SCPI Consortium and enables control of instruments offered by various manufacturers following a common rule.

• MS269xA Mode

The commands for the MS269xA Signal Generator application can be used for controlling.

- MS2830A Mode The commands for the MS2830A Signal Generator application can be used for controlling.
- MG3700A Mode The commands for the MG3700A Vector Signal Generator can be used for controlling.
- MG364x Mode

The commands for the MG364xA Synthesized Signal Generator can be used for controlling.

Refer to the following descriptions corresponding to your language mode:

SCPI, MS269xA, and MS2830A Modes: E.7 "SCPI Device Message Details"

MG3700A, MG364x Modes:

E.8 "Native Device Message Details"

Follow the procedure shown below to initialize the language mode to the SCPI mode.

- Preset All Refer to 9.5.1 "Preset".
- Factory Preset Refer to 9.4.4 "Install".
- System Recovery Functions Refer to 9.7.6 "System Recovery Functions".

E.6.1 Language mode switching

(∪tility) or Top>→>Utility

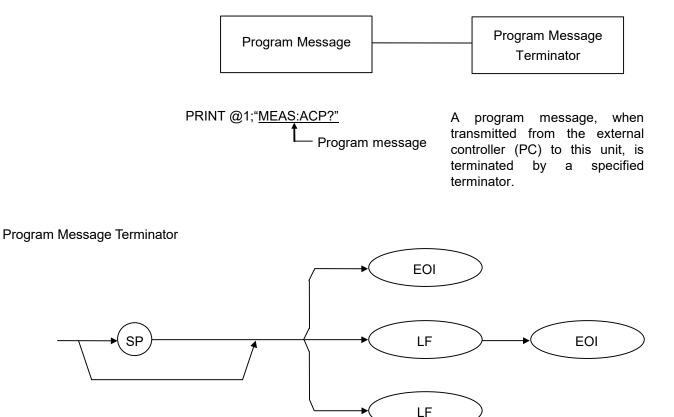
Refer to 9.4.1 "Interface Setting" for language switch.

E.7 SCPI Device Message Details

E.7.1 SCPI Program message formats

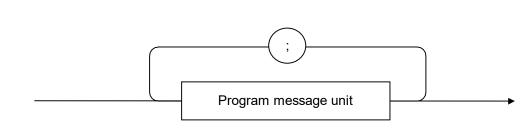
Among all device messages, those that are transmitted from the external controller (PC) to the MG3710A/MG3710E/MG3740A are called "program messages". Program messages fall into two groups: program commands, which set or specify instrument parameters, and program queries, which request parameters and measurement results.

An example of transmitting a program message from the external controller (PC) program to the MG3710A/MG3710E/MG3740A with a PRINT or any other statement is shown below.



CR (Carriage Return) is ignored without being processed as a terminator.

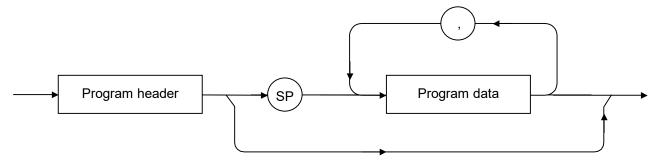
Program message



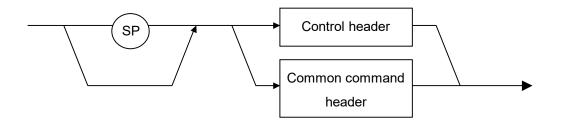
<Example> PRINT @1; "CONF:ACP; READ:ACP?"

Multiple commands can be transmitted separately by separating them with semicolons (";").

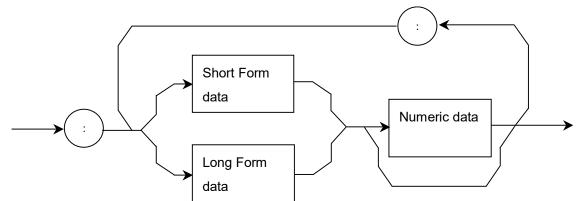
Program message unit



Program header

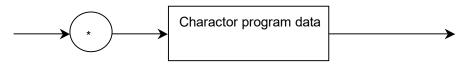


Control header

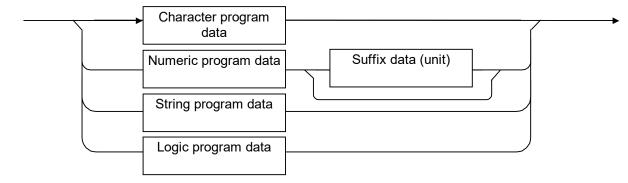


Short Form data corresponds to the short form of SCPI. Long Form data corresponds to the long form of SCPI. Refer to the character program data for each specification. The numeric data is specified as a single ASCII code byte indicating any value within the range of numeric data, from 0 to 9.0.

Common command header



The common command header is denoted by an asterisk (*) before the character program data.



Program data

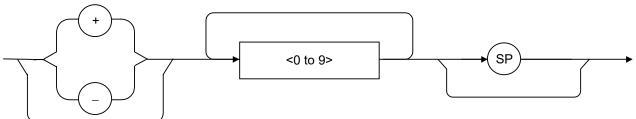
Character program data

Defined strings of data are composed of any of the lowercase and uppercase alphanumeric characters A to Z and 0 to 9, and the underscore ("_").

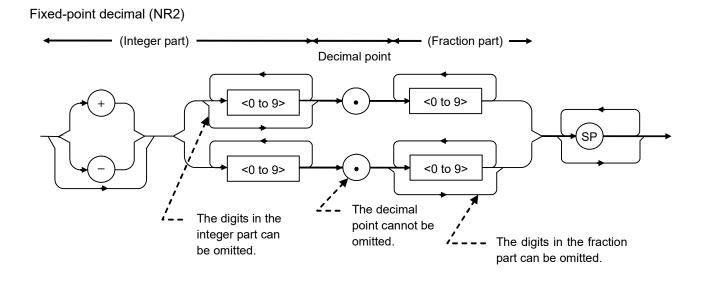
Numeric program data

Numeric program data is grouped into four types: integral (NR1), fixed-point decimal (NR2), floating-point decimal (NR3), and hexadecimal formats.



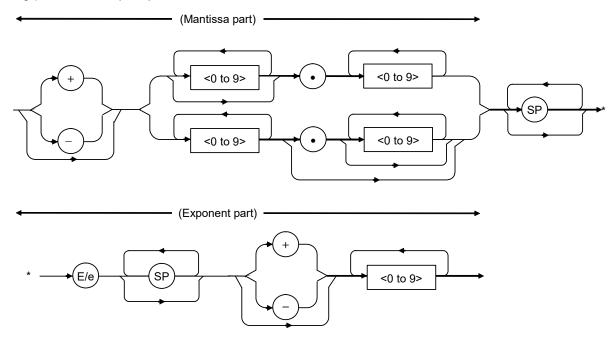


- Integral data can have leading zeros (e.g., 005, +005).
- No space is allowed between a sign (+ or –) and the numeric value that follows it.
- The plus ("+") sign can be omitted (e.g., 005, +005).



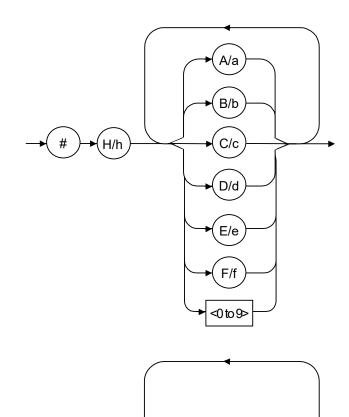
- An integer is represented in the integral part.
- No space is allowed between a digit and the decimal point that follows it.
- The plus ("+") sign can be omitted.
- The digit 0 in the integral part may be omitted.
- Any number of zeros, including none, may precede the numeric value in the integral part (e.g., -0.5, +00204, -5).

Floating-point decimal (NR3)



- E denotes the power of 10, or the exponent.
- Spaces are allowed both before and after, only before or only after E/e.
- A numeric value is required in the mantissa.
- Alternatively selectable numeric values (ex. 1|2) and character strings are unavailable.
- The plus ("+") sign can be omitted (from both the mantissa and the exponent).
 - <Examples>
 - $-22.34E+6 \rightarrow -22.34 \times 10^{6} (= -22,340,000)$
 - $5.3\mathrm{e}{-4} \rightarrow 5.3 \times 10^{-4} \ (= 0.00053)$

Hexadecimal data



0/1

►(B/b

#

Binary data



Suffix data

The table below lists the suffix data that is used in the MG3710A/MG3710E/MG3740A.

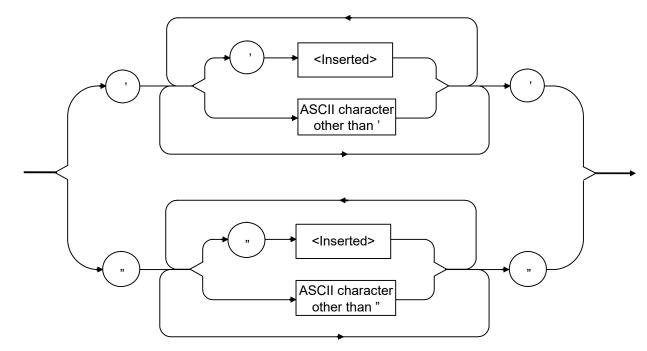
The suffix codes available vary depending on the function.

Category	Suffix Code	Unit
	GHZ or GZ	GHz
D	MHZ or MZ	MHz
Frequency	KHZ or KZ	kHz
	HZ	Hz
	DB	dB
	DBM or DM	dBm
	DBUV	dBµV
Level	DBUVE	dBµV (emf)
	V	V
	MV	mV
	UV	μV
	S	s
	MS	ms
Time	US	μs
	NS	ns
	PS	\mathbf{ps}
Angle	DEG degree	
Percent	Percent PCT %	

Table E.7.1-1 S	ouffix codes
-----------------	--------------

String program data

An arbitrary character string is enclosed by one pair of double quotation marks ("") or single quotation marks (''). The characters that can be used vary depending on their function.



Logic program data

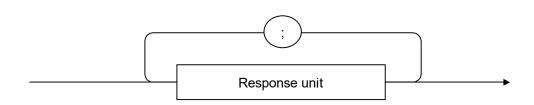
Logical program data indicates a logical value by the program data specified in SCPI. On/off of character program data and 1/0 of numeric program data are defined as values corresponding to true/false.

E.7.2 SCPI Response message formats

The formats in which the external controller (PC) transmits response messages from the MG3710A/MG3710E/MG3740A by way of INPUT and other statements are described below.

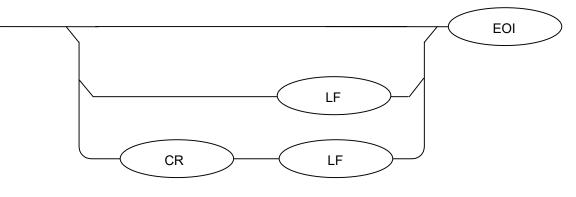


Response message



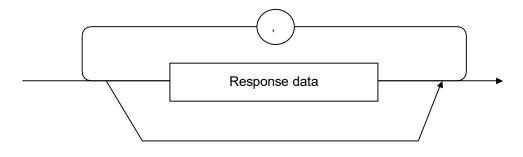
A response message is composed of one or more response message units to one or more program queries issued with one PRINT statement.

Response Message Terminator

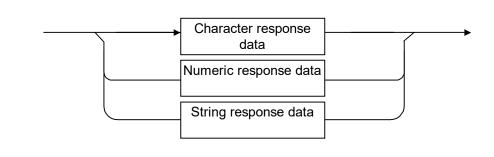


Use a ':SYSTem:COMMunicate:GPIB[1][:SELF]:DELimiter' command to specify the terminator format.

Response Unit



Response unit has no header and only returns the data of the measurement data.

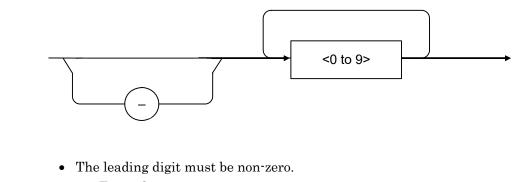


Character response data

Response data

Defined strings of data are composed of any of the lowercase and uppercase alphanumeric characters A to Z and the digits 0 to 9, and the underscore ("_").

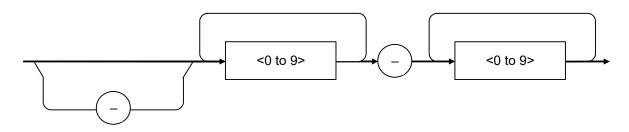
Numeric response data Integer (NR1)



<Examples>

123, -1234

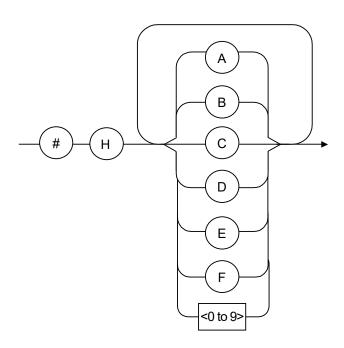
Fixed-point decimal (NR2)



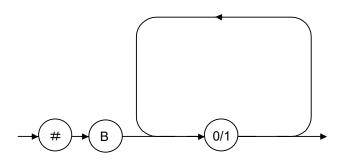
- The leading digit must be non-zero.
- A fixed-point decimal number having a value of 0 in its decimal place is output as an integer.

<Examples> 12.34, -12.345

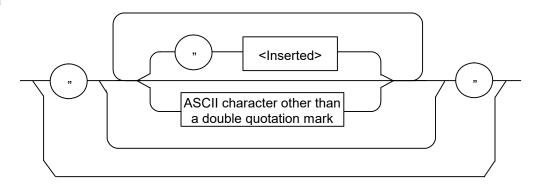
Hexadecimal data



Binary data

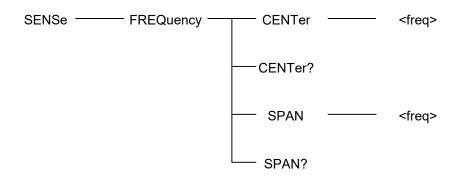


String response data



E.7.3 Structure of SCPI command

The SCPI commands are based on a layered structure. The commands are grouped according to their related functions, and each of them has a layer structure called a "sub-system".



Example of SCPI command tree

Although the same header may be in the commands, it corresponds to each function, according to the position of the header. Therefore, the commands need to be described with all the headers available on the full path.

E.7.4 Command definition method

:SENSe:FREQuency:CENTer <freq> :SENSe:FREQuency:CENTer? :SENSe:FREQuency:SPAN <freq> :SENSe:FREQuency:SPAN? Example of SCPI command

The command tree in the previous page comprises the SCPI commands listed above. Overviews of the SCPI command definitions are shown below.

<Command Format>

The command starts with a colon (":"), and the commands are configured by consolidating a header with a header by a colon (":").

<Omission format of header>

The headers have both a short and a long form, the short form being an abbreviated version of the long form. The commands are interpreted as being the same, regardless of whether the short or long form is used (both can be used at the same time). Uppercase and lower case alphabetic characters are used in this manual to distinguish between the short and long forms. (Uppercase letters denote the short form.) It should be noted that the headers are not case sensitive.

Example:	
long form	>:SENSe:FREQuency:CENTer 1000000
short form	> :SENS:FREQ:CENT 1000000
long + short form	>:SENSe:FREQ:CENTer 1000000

<Option Node>

[] indicates an Option Node.

A header enclosed by square brackets ("[]") may be omitted, and is treated as the same command whether omitted or not.

Example:	
STATus:OPERation:[EVENt]?	
When the header is not omitted	>:STATus:OPERation:EVENt?
When the header is omitted	> :STATus:OPERation?

<Header Separator>

There must be at least one space between a command and a parameter. Furthermore, if there is more than one parameter, they need to be separated by commas.

E.7.5 Composition of commands

As in the following examples, commands can be combined by a semi-colon (";"). The second command is referred to as the same level as the bottom layer of the first command. Thus, the second command can be described as in Example 1, or can be described without the upper header over FREQuency, as in Example 2.

Example 1:	>:SENSe:FREQuency:CENTer 1000000
	:SENSe:FREQuency:SPAN 500000
Example 2:	>:SENSe:FREQuency:CENTer 1000000;SPAN
	500000

E.7.6 Selecting SG1/2

Two SGs can be installed on the MG3710A/MG3710E/MG3740A. When the language mode is SCPI, the target SG can be selected with the beginning node of commands for controlling individual functions.

To specify the target SG: Specify the beginning node of command ":SOURce[1]|2",":MMEMory[1]|2",":OUTPut[1]|2," ":UNIT[1]|2",":INITiate[1]|2",":CALibration[1]|2" as shown below.

```
To select SG1:

":SOURce1", ":MMEMory1", ":OUTPut1", ":INITiate1", ":UNIT1",

":CALibration1" or

":SOURce", ":MMEMory", ":OUTPut", ":INITiate", ":UNIT", ":CAL

ibration"

To select SG2:

:SOURce2, :MMEMory2, :OUTPut2, :INITiate2, :UNIT2, :CALibratio

n2

To control active SG:

Omit (if possible)

To activate SG, use the following command:
```

[:SOURce]:PORT 1|2

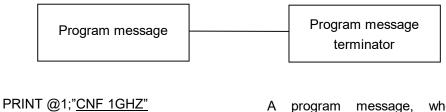
	s for specifying frequencies are provided examples. [1] 2]:FREQuency[:CW :FIXed] <freq></freq>
-	To select 1 GHz for the frequency of SG1 REQ:CW 1GHZ, or SOUR:FREQ:CW 1GHZ
-	To select 2 GHz for the frequency of SG2 REQ:CW 2GHZ
Example 3: PORT 2	To activate SG2 and select 3 GHz for the frequency of SG2 $$
FREQ:CW	3GHZ

E.8 Native Device Message Details

E.8.1 Native Program message formats

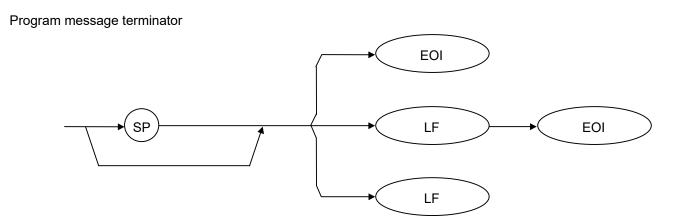
Among all device messages, those that are transmitted from the external controller (PC) to the MG3710A/MG3710E/MG3740A are called "program messages". Program messages fall into two groups: program commands, which set or specify instrument parameters, and program queries, which request parameters and measurement results.

An example of transmitting a program message from the external controller (PC) program to the MG3710A/MG3710E/MG3740A with a PRINT or any other statement is shown below.



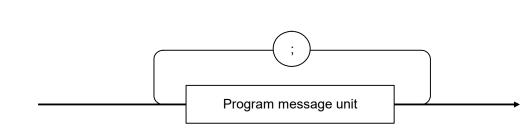
Program message

A program message, when transmitted from the external controller (PC) to this unit, is terminated by a specified terminator.



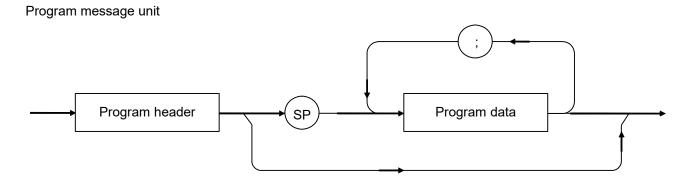
CR (Carriage Return) is ignored without being processed as a terminator.

Program message



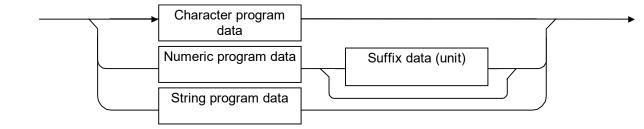
<Example> PRINT @1;"CNF 1GHZ;RLV 0DBM"

Multiple commands can be transmitted separately by separating them with semicolons (;).



The program header of each IEEE488.2 common command begins with an asterisk (*). The program header of each program query (query) generally ends with a question mark (?).

Program data



Character program data

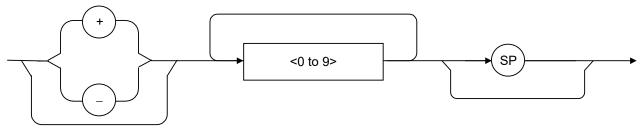
Defined strings of data are composed of any of the alphabetical lower-case and upper-case characters A to Z, the digits 0 through 9, and the underscore ().

<examples></examples>	
LOAD SIGANA	Loads the Signal Analyzer.
SOUND OFF	Sets sound to Off.

Numeric program data

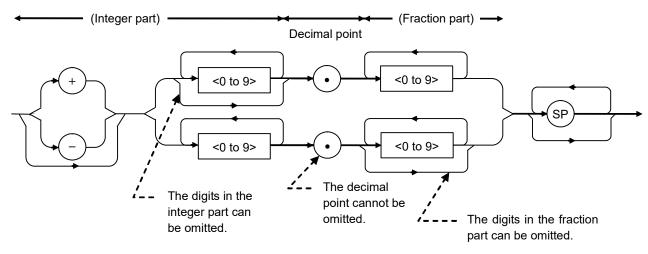
Numeric program data is grouped into four types: integral (NR1), fixed-point decimal (NR2), floating-point decimal (NR3), and hexadecimal.

Integral (NR1)



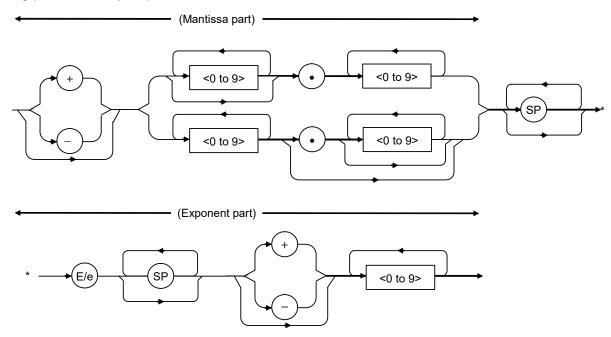
- Integral data can have leading zeros (e.g., 005, +005).
- No space is allowed between a sign (+ or –) and the numeric value that follows it.
- The "+" sign can be omitted (e.g., 005, +005).

Fixed-point decimal (NR2)



- An integer is represented in the integral part.
- No space is allowed between a digit and the decimal point that follows it.
- The "+" sign can be omitted.
- The digit 0 in the integral part may be omitted.
- Any number of zeros may precede the numeric value in the integral part (e.g., -0.5, +00204, -5).

Floating-point decimal (NR3)

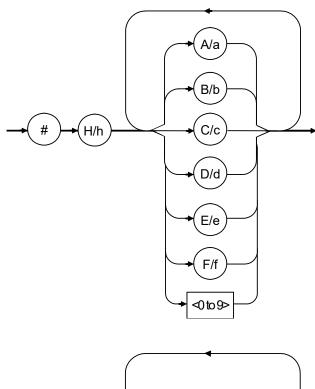


- E denotes the power of 10, or the exponent.
- Spaces are allowed both before and after, only before or only after E/e.
- A numeric value is required in the mantissa.
- Alternatively selectable numeric values (ex. 1|2) and character strings are unavailable.
- The "+" sign can be omitted (from both the mantissa and exponent). <Examples>

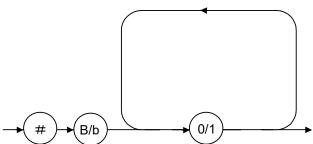
 $-22.34E+6 \rightarrow -22.34 \times 10^{6} (= -22,340,000)$

 $5.3e-4 \rightarrow 5.3 \times 10^{-4} (= 0.00053)$

Hexadecimal data



Binary data



Suffix data

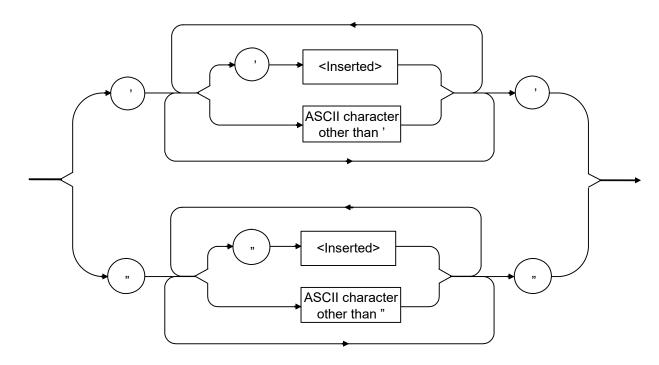
The table below lists the suffix data that is used. The suffix codes available vary depending on the function.

	Table E.8.1-1 Su	ffix codes
Category	Suffix Code	Unit
Frequency	GHZ or GZ MHZ or MZ KHZ or KZ HZ	GHz MHz kHz Hz
	DB	dB
	DBM or DM	dBm
	DBUV	$dB\mu V$
	DBUVEMF	dBµV (emf)
	V	V
Level	MV UV	mV μV
	DBUV	dBµV
	DBUVE	dBµV (emf)
	V MV UV	V mV μV
Time	S S MS ma	
Angle	DEG	degree
Percent	PCT	%

Table E.8.1-1 Suffix codes

String program data

Arbitrary character string enclosed by one pair of "" (double quotation marks) or '' (single quotation marks). The characters that can be used vary depending on the function.

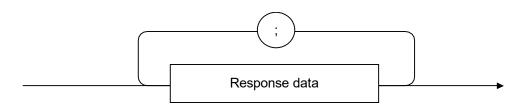


E.8.2 Native Response message formats

The formats in which the external controller (PC) transmits response messages from the MG3710A/MG3710E/MG3740A by way of INPUT and other statements are described below.

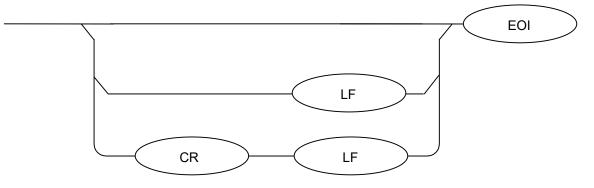


Response message



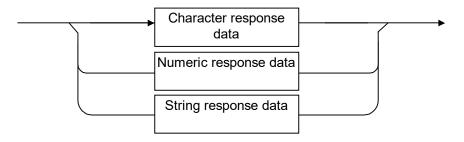
A response message is composed of one or more response message units to one or more program queries issued with one PRINT statement.

Response message terminator



Use a TRM command to specify the terminator format.

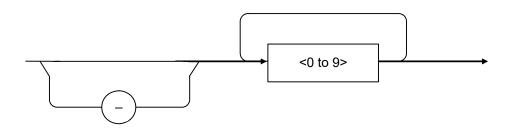
Response data



Character response data

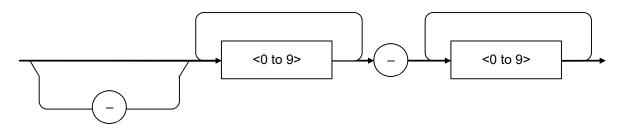
Defined strings of data are composed of any of the alphabetical lower case and upper case characters A to Z, the digits 0 through 9, and the underscore ().

Numeric response data Integer (NR1)



• The leading digit must be non-zero. <Examples> 123, -1234

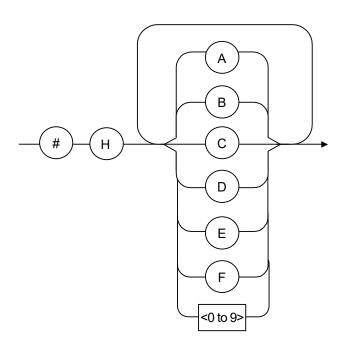
Fixed-point decimal (NR2)



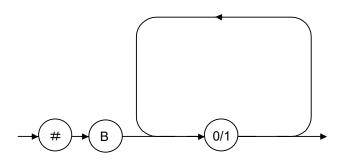
- The leading digit must be non-zero.
- A fixed-point decimal number having a value of 0 in its decimal place is output as an integer.

<Examples> 12.34, -12.345

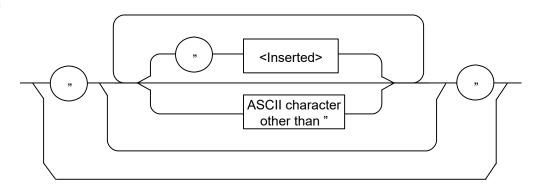
Hexadecimal data



Binary data



String response data



E.8.3 Selecting SG1/2

Two SGs can be installed on the MG3710A/MG3710E/MG3740A. When the language mode is Native, individual functions of active SG are controlled.

To activate SG, use the following command: SELECTSG 1|2

Refer to Appendix F.1.1 "Functions Device Messages Common to Measurement Equipment".

Example: To select 1 GHz for the frequency of SG1

SELECTSG 1 FREQ 1GHZ

E.9 Status Structure

The Status Byte (STB) that is transmitted to the external controller (PC) complies with the IEEE488.1 standard. Its bit string, called a "status summary message," provides summary information about the current data placed in a register or queue.

E.9.1 IEEE488.2 standard status model

The standard model of the status structure defined by IEEE488.2 is shown below.

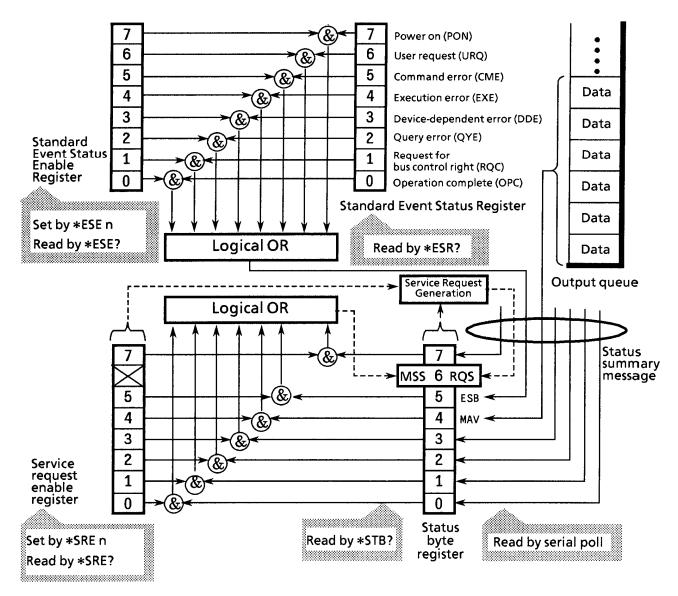


Figure E.9.1-1 IEEE488.2 standard status model

In the status model, an IEEE488.1 status byte is used as the lowest-level status, which consists of seven summary message bits that are supplied from an upper status structure. The status data structure is organized into a register model and a queue model to generate these summary message bits.

Table E.9.1-1	Register model and queue model
---------------	--------------------------------

Register model	Queue model
A set of registers used to keep a record of the events and conditions that have been encountered in the device. Its structure is built of an Event Status register and an Event Status Enable register. If their AND operation results in non-zero, the corresponding bit of the status byte is set to 1; otherwise, it is set to 0. If their OR operation results in 1, the corresponding summary bit is set to 1; otherwise, it is set to 0.	A queue used to keep a sequential record of status or information. In the queue structure, a bit is set to 1 only if data exists at the corresponding position in the queue; otherwise, a bit is 0.

On the basis of the register model and the queue model thus described, the standard model in the IEEE488.2 status data structure is assembled of two kinds of register models and one queue model.

<1> Standard Event Status register and Event Status Enable register

 $<\!\!2\!\!>$ Status Byte register and Standard Event Enable register

<3> Output queue

Table E.9.1-2	Register models and queue model of IEEE488.2 standard status		
Standard Event State	us Register	Status Byte Register	Output Queue

Standard Event Status Register	Status Byte Register	Output Queue
The Standard Event Status register is structured in the register model described above. Among all the events that the device may encounter, this register holds bits that represent eight kinds of standard events: <1> power-on, <2> user request, <3> command error, <4> execution error, <5> device-dependent error, <6> query error, <7> bus control request, and <8> operation complete. Bit6 (DIO6) of the Status Byte Register works as an OR output bit to report an Event Summary Bit (ESB) summary message.	The Status Byte register holds an RQS bit seven summary message bits from the status data structure. Bit6 (DIO7) of the Service Request Enable register is system-reserved as an RQS bit to report a service request to the external controller. The mechanism of this SRQ conforms to the specifications of IEEE488.1.	The Output Queue is structured in the queue model described above. Bit4 (DIO5) of the Status Byte Register works as a Message Available (MAV) summary message to report the availability of data in the output buffer.

E.9.2 Status Byte (STB) register

The STB register consists of an STB device and an RQS (or MSS) message.

(1) ESB and MAV summary messages

The ESB and MAV summary messages are described below.

ESB summary message

The ESB (Event Summary Bit) summary message is a message defined by IEEE488.2. It is reported by STB register bit5. The ESB summary message is set to 1 when any one of the bits registered in the Standard Event Status register is set to 1 where event occurrence is enabled. The ESB summary bit is, in turn, set to 0 when none of the events registered in the Status Event Status register occur where event occurrence is enabled.

MAV summary message

The MAV (Message Available) summary message is a message defined by IEEE488.2. It is reported by STB register bit4. This bit indicates whether the output queue is empty. It is used by the device to synchronize message exchanges with the external controller (PC). For example, the external controller (PC) might transmit a query command to the device and wait for MAV to be set to 1. If reading from the output queue is begun without first checking MAV, all system bus actions are deferred until the device responds.

E.9.3 SCPI Device-dependent summary messages

The structure of the status byte register is as shown below when the SCPI mode is selected.

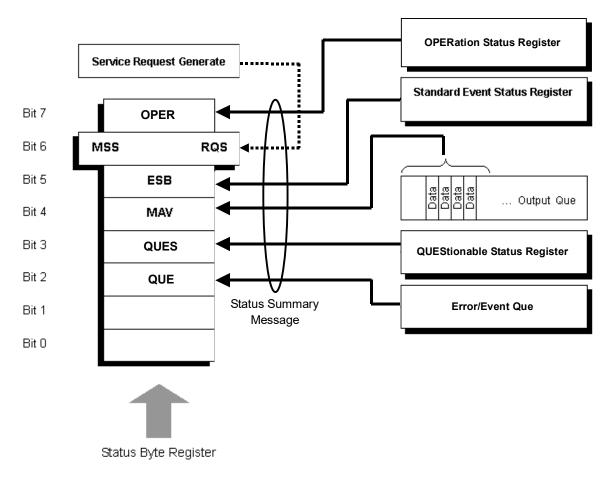


Figure E.9.3-1 Status byte register in SCPI mode

E.9.4 Native Device-dependent summary messages

When language mode is Native, in addition to the Status Bite Register defined by IEEE488.2, Extended Event Status Bits (EESB) are defined individually. EESB 0 to 3 are used as summary bits for application-specific Extended Event Status registers.

Both LEESB3 and EESB2 correspond to the event status expansion of main application (SG1) of the MG3710A/MG3710E/MG3740A, and also both EESB1 and EESB0 correspond to that of the sub-application (SG2) of the MG3710A/MG3710E/MG3740A.

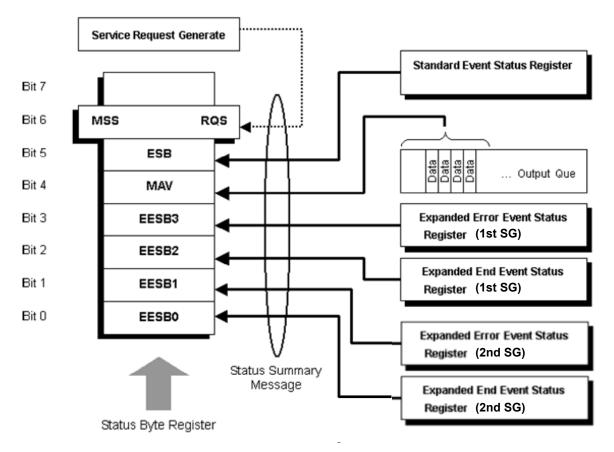


Figure E.9.4-1 Status byte register in Native mode

E.9.5 Reading and clearing STB register

The STB register is read by serial polling or by using an *STB? query. Either way, an STB message as defined by IEEE488.1 is read, but the value that is transmitted to bit6 (position) varies with each method used. The STB register can be cleared using the *CLS command.

Use Serial Polling to read STB register

If serial polling is implemented under IEEE488.1, a 7-bit status byte and an RQS message bit based on IEEE488.1 are returned. Serial polling does not alter the value of the status byte. The device will set the RQS message bit to 0 immediately on polling.

Use an *STB Common Query to read STB register

Issuing an *STB common query causes the device to transmit a response message, in the integer format, comprising the MSS (Master Summary Status) message in the STB register. Hence, a response to *STB? matches one to serial polling, except that an MSS summary message appears at the bit6 position, instead of an RQS message.

Define *MSS (Master Summary Status)

The MSS message indicates that the device has at least one service request condition. The MSS message appears at the bit6 position as a device response to an *STB query, but not as a response to serial polling. It must not be viewed as part of the IEEE488.1 status byte. MSS consists of total OR which is the combination of the bits of the STB register and the SRQ Enable (SRE) register with one another.

Use the *CLS Common Command to clear STB register

The *CLS common command clears the entire status structure and also summary messages responding to it. The execution of *CLS does not affect the settings of the enable registers.

E.9.6 Service Request (SRQ) enable operation

Bits 0 to 7 of the Service Request Enable (SRE) register control whether the corresponding bits of the STB register will generate an SRQ. The SRB register bits are associated with the STB register bits. If the STB register bit associated with a SRE register bit that is 1 is set to 1, the device sets the RQS bit to 1, issuing a service request to the external controller (PC).

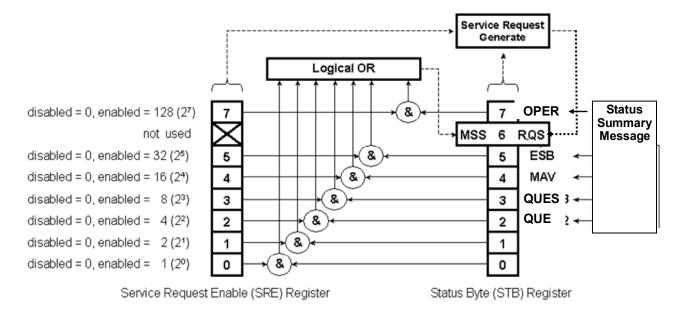


Table E.9.6-1 Service Request (SRQ) Enable Operation (SCPI Mode)

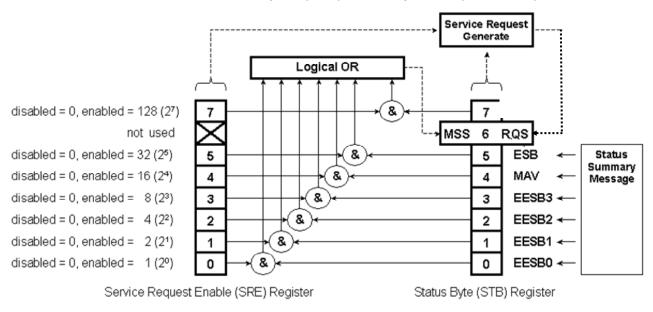


Table E.9.6-2 Service Request (SRQ) Enable Operation (Native Mode)

E.9.7 Standard Event Status register model

Bit definitions of Standard Event Status register

The operations of the Standard Event Status register are shown below.

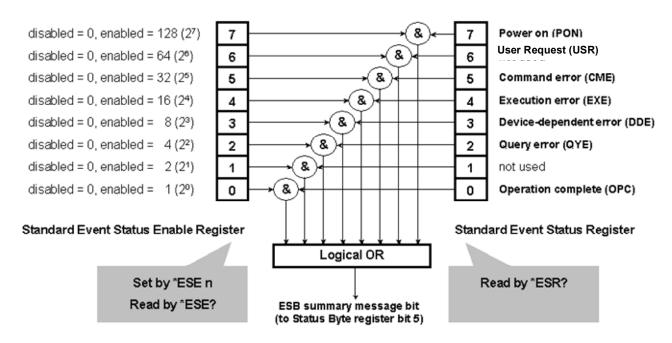


Figure E.9.7-1 Standard event status register

The Standard Event Status Enable (ESE) register specifies which bit of the Event Status register will cause a summary message to become true when it is set.

bit	Event name	Description	
7	Power on (PON)	Power transition from Off to On	
6	User Request	Transition from Remote to Local	
5	Command error (CME)	Device message with illegal header received	
4	Execution error (EXE)	Device message with illegal parameter received or the executed function has not completed normally	
3	Device-dependent error (DDE)	Error caused by a condition other than CME, EXE, and QYE	
2	Query error (QYE)	Attempt to read data from the output queue when it is empty or queued data lost before it is read	
1	Not used	—	
0	Operation complete (OPC)	Set to 1 when the MG3710A/MG3710E/MG3740A has processed the *OPC command.	

Table E.9.7-1 Bit events

E.9.8 Standard Event Status register operation

The operation methods for the Standard Event Status registers and Standard Event Status Enable registers are shown in the table below.

Register Operation		Operation	
	Read	This register is read using an *ESR? common query.	
	Write	This register cannot be written externally.	
		This register is cleared when:	
Standard Event Status		<1> The *CLS command is received.	
register	Clear	<2> The power is turned on (bit7 is turned on, with all other bits being cleared to 0).<3> An event is read in response to an *ESR? query command.	
	Read	This register is read using an *ESE? common query.	
	Write	This register is written to using an *ESE common command.	
Standard Event Status Enable register		This register is cleared when:	
	Clear	<1> An *ESE command with a data value of 0 is received.	
		<2> The power is turned on.	

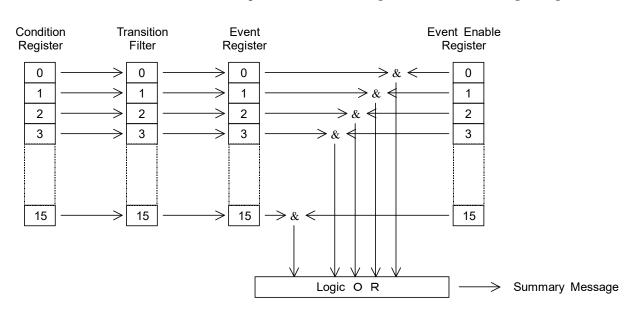
Table E.9.8-1	Standard Event Status register operation
	otandara Eront otatao regiotor operation

E.9.9 SCPI Specification Status register

The following registers are available, in addition to the status register specified in IEEE488.2 by the specification of SCPI in the SCPI mode.

Register-Filter	Operation	
QUEStionable Status register	Reports the status of signals such as measurement results. It is used to require service to external controller when an error occurs. It is not used in MG3710A/MG3710E/MG3740A.	
OPERation Status register	Reports some of the statuses of MG3710A/MG3710E/MG3740A.	

Table E.9.9-1 SCPI Specification Status registers



The SCPI specification status register has the following configuration.

Figure E.9.9-1	Configuration	of SCPI Specification	Status Register
		••••••••••••••••••••••••••••••••••••••	

Register-Filter	Operation		
Condition Register	Monitors device status and changes depending on the device status. Therefore, this register does not store the status.		
Transition Filter	 Sets the contents of the condition register to the event register. The transition filter has the three types shown below, according to what change of the condition register is measured. (1) Positive direction change The event becomes true only when the corresponding condition changes false into true. (2) Negative direction change The event becomes true only when the corresponding condition changes from true into false. (3) Both direction change The event becomes true when a change in either the positive or negative direction is present. 		
Event Register	Stores the output of transition filter.		
Event Enable Register	Selects which bit of the corresponding event register is used to set the summary message to true when set to 1.		

Table E.9.9-2	SCPI Specification	Status register	configurations
---------------	--------------------	-----------------	----------------

E.9.10 SCPI specification status register operation

How to operate the SCPI specification status register and error/event queue is shown below.

Register		Operation	
	Read	:STATus::EVENt?	
	neau	This register is read using a query.	
	Write	This register cannot be written externally.	
SCPI event register		This register is cleared when:	
(Main Application)		(1) $*CLS$ command is received.	
	Clear	(2) The power is On.	
	olear	(3) An event is read in response	
		to :STATUS::EVENt? Query command.	
		(4) A language mode is switched.	
	Read	:STATus::ENABle?	
	neau	This register is read by using an query.	
	Write	:STATus::ENABle	
SCPI enable register	write	This register is written by using a command.	
(Main Application)		This register is cleared when:	
		(1) :STATUS:PRESet command is received.	
	Clear	(2) The power is On.	
		(3) :STATUS::ENABLE 0 command is received.	
		(4) A language mode is switched.	

Table E.9.10-1 SCPI Status register operation

Register		Operation	
		:STATus::PTRansition?	
	Read	:STATus::NTRansition?	
		This register is read using a query-	
		:STATus::PTRansition	
SCPI Transition Filter	Write	:STATus::NTRansition	
(Main Application)		This register is written using a command.	
		This register is cleared when.	
		(1) :STATus:PRESet command is received.	
	Clear	(2) The power is on.	
	oroar	(3) :STATus::PTRansition 0 command is	
		received.	
		(4) A language mode is switched.	
	Read	:SYSTem:ERRor?	
		This register is read using a query.	
	Write	This register cannot be written externally.	
Error/Event Queue		This register is cleared when:	
(Main Application)	Clear	(1) *CLS command is received.	
		(2) The power is on.	
		(3) An event is read in response to:SYSTem:ERRor?	
		Query command.	
		(4) A language mode is switched.	

Table E.9.10-1	SCPI Status register operation (Cont'd)
----------------	---

The values after the register and filter influenced by :STATus:PRESet have been reset are shown in the following table.

Table E.9.10-2Values after the register and filter influenced by :STATus:PRESet have been
reset.

Register	Enable Filter	Reset Value
OPERational Status Register	Enable Register	All 0
QUEStionable Status Register	PTRansition Filter	All 1
	NTRansition Filter	All 0

E.9.11 Extended Event Status register

When the language mode is Native, the application running on the MG3710A/MG3710E/MG3740A has a specific extended event status register and an enable register.

The extended event status register transmits a summary message to EESB0 to EESB3 bits of the status byte register. This allows you to detect events of two applications running on the MG3710A/MG3710E/MG3740A using service requests.

In general, the applications are categorized into Main Application (1st SG) and Sub Application (2nd SG).

Summary messages of the extended event status register of Main Application are transmitted to EESB3 and EESB2 of the status byte register.

Summary messages of the extended event status register of Sub Application are transmitted to EESB1 and EESB0 of the status byte register.

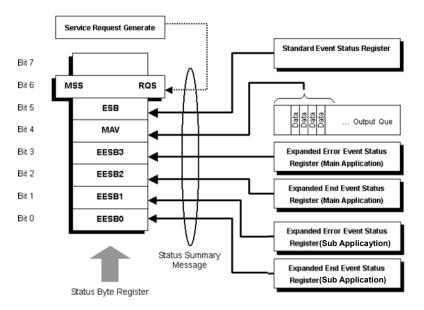


Figure E.9.11-1 Extended event status register model

E.9.12 Extended Error Event Status register (Main Application)

The operation model of the Extended Error Event Status registers for the Main Applications is shown below.

Main Application indicates 1st SG. The target of the status register and the enable register is 1st SG.

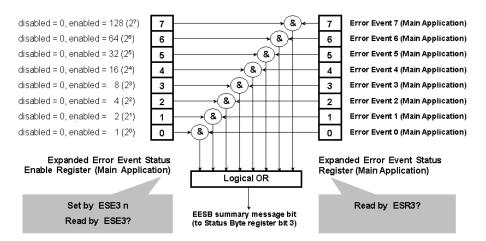


Figure E.9.12-1 Extended Error Event Status register (Main Application)

The Extended Error Event Status Enable register (on the left of the figure above) specifies which bit of the Event Status register will cause a summary message to become true when it is set.

For specifications of the event status register on the right side of the above figure, refer to Appendix F.1 "Native Device Messages".

The summary message of this register is transmitted to EESB 3 of the Status Byte register.

<Program example>

To generate a service request when the error event 0 of 1st SG occurs

*SRE 8	;	Enables bit3 of the Service Request Enable register.
ESE3 1	;	Enables bit0 of the Extended Error Event Status Enable register of the main application.

E.9.13 Extended End Event Status register (Main Application)

The operation model of the Extended End Event Status registers of Main Applications is shown below.

Main Application indicates 1st SG. The target of the status register and the enable register is 1st SG.

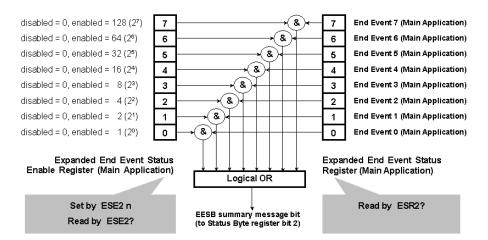


Figure E.9.13-1 Extended End Event Status register (Main Application)

The Extended End Event Status Enable register (on the left of the figure above) specifies which bit of the Event Status register will cause a summary message to become true when it is set.

For specifications of the event status register on the right side of the above figure, refer to Appendix F.1 "Native Device Messages".

The summary message of this register is transmitted to EESB 2 of the Status Byte register.

<Program example>

To generate a service request when the end event 0 of 1st SG occurs

*SRE 4	;	Enables bit2 of the Service Request Enable register.
ESE2 1	;	Enables bit0 of the Extended End Event Status Enable register of the main application.

E.9.14 Extended Error Event Status register (Sub Application)

The operation model of the Extended Error Event Status registers for Sub Applications (an example with Application a) is shown below.

Sub Application indicates 2nd SG. The target of the status register and the enable register is 2nd SG.

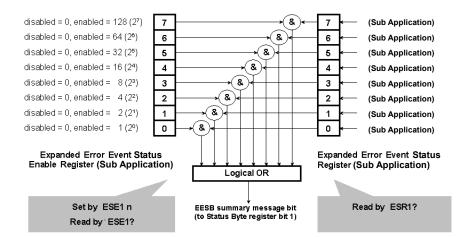


Figure E.9.14-1 Extended Error Event Status Register (Sub Application)

The Extended Error Event Status Enable register (on the left of the figure above) specifies which bit of the Event Status register will cause a summary message to become true when it is set.

For specifications of the event status register on the right side of the above figure, refer to Appendix F.1 "Native Device Messages".

The summary message of this register is transmitted to EESB 1 of the Status Byte register.

<Program example>

To generate a service request when the error event 0 of 2nd SG occurs

*SRE	2	;	Enables bit1 of the Service Request Enable register.
ESE1	1	;	Enables bit0 of the extended error event status enable register of Sub Application.

E.9.15 Extended End Event Status register (Sub Application)

The operation model of the Extended End Event Status registers of Sub Applications (an example with Application a) is shown below.

Sub Application indicates 2nd SG. The target of the status register and the enable register is 2nd SG.

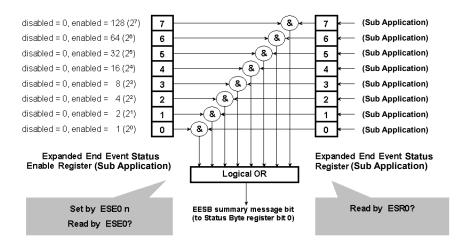


Figure E.9.15-1 Extended End Event Status Register (Sub Application)

The Extended End Event Status Enable register (on the left of the figure above) specifies which bit of the Event Status register will cause a summary message to become true when it is set.

For specifications of the event status register on the right side of the above figure, refer to Appendix F.1 "Native Device Messages".

The summary message of this register is transmitted to EESB 0 of the Status Byte register.

<Program example>

To generate a service request when the end event 0 of 2nd SG occurs

*SRE	1	;	Enables bit0 of the Service Request Enable register.
ese0	1	;	Enables bit0 of the extended end event status enable register of Sub Application.

E.9.16 Extended Event Status register operation

The operation methods for the Extended Event Status registers and Extended Event Status Enable registers are shown in the table below.

Register	Operation			
	Read	This register is read using an ESR3? query.		
	Write	This register cannot be written externally.		
Extended Error Event Status Register (Main Application)	Clear	 This register is cleared when: <1> The *CLS command is received. <2> The power is turned on. <3> An event is read in response to an ESR3? query command. <4> When the language mode has been switched. 		
	Read	This register is read using an ESE3? query.		
	Write	This register is written to using an ESE3 command.		
Extended Error Event Status Enable Register (Main Application)	Clear	 This register is cleared when: <1> An ESE3 command with a data value of 0 (i.e., ESE3 0) is received. <2> The power is turned on. <3> When the language mode has been switched. 		
	Read	This register is read using an ESR2? query.		
	Write	This register cannot be written externally.		
Extended End Event Status Register (Main Application)	Clear	 This register is cleared when: <1> The *CLS command is received. <2> The power is turned on. <3> An event is read in response to an ESR2? query command. <4> When the language mode has been switched. 		
	Read	This register is read using an ESE2? query.		
	Write	This register is written to using an ESE2 command.		
Extended End Event Status Enable Register (Main Application)	Clear	 This register is cleared when: <1> An ESE2 command with a data value of 0 (i.e., ESE2 0) is received. <2> The power is turned on. <3> When the language mode has been switched. 		

Table E.9.16-1 Exte	nded Event Status	Register Operation
---------------------	-------------------	--------------------

E.9 Status Structure

Register	Operation			
	Read This register is read using an ESR1? query.			
	Write	This register cannot be written externally.		
Extended Error Event Status Register (Sub Application)	Clear	<3> An event is read in response to an ESR1? que command.		
	Read	<4> When the language mode has been switched.This register is read using an ESE1? query.		
	Write	This register is written to using an ESE1 command.		
Extended Error Event Status Enable Register (Sub Application)	Clear	 This register is written to using an EBET communit. This register is cleared when: <1> An ESE1 command with a data value of 0 (i.e., ESE1 0) is received. <2> The power is turned on. <3> When the language mode has been switched. 		
	Read	This register is read using an ESR0? query.		
	Write	This register cannot be written externally.		
Extended End Event Status Register (Sub Application)	Clear This register is cleared when: <1> The *CLS command is received. <2> The power is turned on. <3> An event is read in response to an ESR0? command. <4> When the language mode has been switch			
	Read	This register is read using an ESE0? query.		
	Write	This register is written to using an ESE0 command.		
Extended End Event Status Enable Register (Sub Application)	Clear	 This register is cleared when: <1> An ESE0 command with a data value of 0 (i.e., ESE0 0) is received. <2> The power is turned on. <3> When the language mode has been switched. 		

 Table E.9.16-1
 Extended Event Status Register Operation (Cont'd)

E.10 Synchronization

This section describes synchronized control of the MG3710A/MG3710E/MG3740A (completing processing of a command message before proceeding to the next one).

The following methods can be used for controlling synchronization:

- (1) Using the *WAI command
- (2) Using the *OPC command
- (3) Using the *OPC? query
- (1) Using the *WAI command

The *WAI (Wait to Continue) command prevents from starting the subsequent operations before the transmitted commands completes their operations. This is an effective method when an overlap command is used.

<Program example> To select a waveform pattern after loading of a waveform pattern completes

This example uses the following overlap command: :MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination <string1>,<string2>[,<device>]

MMEM:LOAD:WAV:WMA "PackageName","PatternName"	;	Loads a waveform pattern.
*WAI	;	Waits until loading completes.
RAD:ARB:WMA:WAV "PackageName","PatternName"	;	Selects a waveform pattern.

(2) Using the *OPC

This method transmits *OPC (Operation Complete), which is the IEEE488.2 common command, to wait until bit0 (OPC) of the standard event status register is enabled, indicating the operation completes. To wait an event, query a standard event status register directly or use a service request.

<Program example>

To select a waveform pattern after loading of a waveform pattern completes

This example uses the following overlap command:

:MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination <string1>,<string2>[,<device>]

*CLS	; Clears the OPC status.
MMEM:LOAD:WAV:WMA "PackageName","PatternName"	; Loads a waveform
5 .	pattern.
*OPC	; Switches to the operation completion waiting status.
*ESR?	; Queries the standard event status register directly.
>0	; No event occurred.
*ESR?	; Queries the standard event status register directly.
>1	; An event occurred.
RAD:ARB:WMA:WAV "PackageName","PatternName"	; Selects a waveform pattern.

(3) Using the *OPC?

This method queries a response of *OPC? (Operation Complete Query), which is the IEEE488.2 common command.

<Program example>

To select a waveform pattern after loading of a waveform pattern completes

This example uses the following overlap command:

:MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination <string1>,<string2>[,<device>]

MMEM:LOAD:WAV:WMA "PackageName","PatternName"	;	Loads a pattern.	waveform
*OPC?	;	Switches operation waiting statu	completion
>1	;	Returns 1 completes.	if lading
RAD:ARB:WMA:WAV "PackageName","PatternName"	;	Selects a pattern.	waveform

E.11 IEEE488.2 Common Device Messages

Described below are the IEEE488.2 Common Device Messages intended to execute the functions of the MG3710A/MG3710E/MG3740A.

E.11.1 IEEE488.2 Common Device Messages List

Function	Comman d	Query	Response	Remarks
Identification Query		*IDN?	<pre>company,mod el,serialnu mber,firmwa re</pre>	model: Main unit model name serial: Main unit serial number version: Software package version
Self Test Query		*TST?	n	<pre>n = bit7 : ALC Alarm bit6 : Internal Baseband</pre>
Operation Complete	*OPC	*OPC?	1	
Preset All	*RST			
Wait to Continue Command	*WAI			
Clear Status Command	*CLS			
Standard Event Status Enable Register Command/Query	*ESE n	*ESE?	n	n = bit7 : Power On bit6 : User request
Standard Event Status Register Query		*ESR?	n	bit5 : Command error bit4 : Execution error bit3 : Device error bit2 : Query error bit1 : Not used bit0 : Operation complete

 Table E.11-1
 IEEE488.2 Common Device Messages

Function	Comman d	Query	Response	Remarks
Service Request Enable Register Command/Query	*SRE n	*SRE?	n	<pre>n = SCPI mode bit7 : OPER bit6 : MSS/RQS bit5 : ESB bit4 : MAV bit3 : QUES bit2 : QUE bit1 : Not used bit0 : Not used Native mode bit7 : Not used bit6 : MSS/RQS bit5 : ESB bit4 : MAV bit3 : EESB3 bit2 : EESB2 bit1 : EESB1 bit0 : EESB0</pre>
Read Status Byte Query		*STB?	n	<pre>n = SCPI mode bit7 : OPER bit6 : MSS/RQS bit5 : ESB bit4 : MAV bit3 : QUES bit2 : QUE bit1 : Not used bit0 : Not used Native mode bit7 : Not used bit6 : MSS/RQS bit5 : ESB bit4 : MAV bit3 : EESB3 bit2 : EESB2 bit1 : EESB1 bit0 : EESB0</pre>
Trigger Control	*TRG			

Table E.11-1 IEEE488.2 Common Device Messages (Cont'd)

E.11.2 IEEE488.2 Common Device Messages Details

This section describes detailed specifications on IEEE488.2 common device message remote control commands for executing MG3710A/MG3710E/MG3740A functions in alphabetical order.

*CLS

Clear Status Command

Function

Clears the status byte resister, standard event status register, extended event status register and output queue data, and disables the wait for operation completion set by *OPC/*OPC? This is a common IEEE488.2 command.

Command

*CLS

Example of Use

To clear status

*ESE/*ESE?

Standard Event Status Enable Command/Query

Function	Sets the standard event status enable register. The standard event status enable register value is returned for the query. This is a common IEEE488.2 command/query.				
Command	*ESE n				
Query	*ESE?				
Response	n				
Parameter	Value = bit0 + bit1 - bit0 : $2^0 = 1$ bit1 : $2^1 = 2$ bit2 : $2^2 = 4$ bit3 : $2^3 = 8$ bit4 : $2^4 = 16$ bit5 : $2^5 = 32$ bit6 : $2^6 = 64$	Value = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7 bit0 : $2^0 = 1$ Operation completion bit1 : $2^1 = 2$ Request control (not used) bit2 : $2^2 = 4$ Query error bit3 : $2^3 = 8$ Device error bit4 : $2^4 = 16$ Execution error bit5 : $2^5 = 32$ Command error bit6 : $2^6 = 64$ User request bit7 : $2^7 = 128$ Power ON			
Details	This is not initialized b This is initialized by P	by the System Reset (Preset) command. Hower On.			
Example of Use	To enable execution er *ESE 48 *ESE? >48	ror and command error			

*ESR?

Standard Event Status Register Query

Function			ent status register value. If this is queried, the gister is cleared. This is a common IEEE488.2
Query	*ESR?		
Response	n		
Parameter	n Value	= bit0 + bit1 + b bit0 : $2^0 = 1$ bit1 : $2^1 = 2$ bit2 : $2^2 = 4$ bit3 : $2^3 = 8$ bit4 : $2^4 = 16$ bit5 : $2^5 = 32$ bit6 : $2^6 = 64$ bit7 : $2^7 = 128$	t status register bit2 + bit3 + bit4 + bit5 + bit6 + bit7 Operation completion Request control (not used) Query error Device error Execution error Command error User request Power ON
Example of Use		0 to 255 y the standard ev nd command erro	vent status register value (when an execution r have occurred)

*IDN?		
Identification Query		
Function		
	This command quer IEEE488.2 query.	ies the device information. This is a common
Query		
	*IDN?	
Response		
	company,model,se	erialnumber,firmware
Parameter		
	company	Manufacturer (ANRITSU)
	model	Product model (7-character alphanumeric)
	serialnumber	Serial number (10-digit number)
	firmware	Version number of this application
Example of Use		
	To query the device	information:
	*IDN?	
	>ANRITSU,MG3710A	A,610000000,1.0.0.0

*OPC/*OPC?

Operation Complete Command/Query

Function		
		and/query to synchronize between the device and (PC). This is a common IEEE488.2
	If a ^{*OPC} command is a to 1 once all active proc	received, the operation completion bit (bit 0) is set cesses are complete.
	If a *OPC? query is rec complete.	eived, 1 is returned once all active processes are
Command	*OPC	
Query	*OPC?	
Response	1	
Details		
	The wait for operation	completion set by *OPC/*OPC? is disabled after
	the following events:	
	Power ON	
	• Reception of DCL or	SCL on the IEEE488.1 interface
	• Reception of the *CI	LS command
	• Reception of *RST co	ommand
	• Completion of all ac	tive processing
Example of Use		
	-	of measurement with *OPC
	*CLS	Clears the event status.
	*SRE 32	Enables the ESB service request.
	*ESE 1	Enables the operation completion bit. "PackageName", "PatternName"
	MMEM:LOAD:WAV:WMA	Loads a waveform pattern.
	*OPC?	Switches to the operation completion waiting
		status.
	>1	Returns 1 if lading completes.
		PackageName", "PatternName"
		Selects a waveform pattern.

*RST	
Reset Command	
Function	
	Initializes the device. This is a common IEEE488.2 command.
Command	
	*RST
Details	
	Initializes the settings and status of all loaded applications.
Example of Use	
	To initialize the device *RST

*SRE/*SRE?

Service Request Enable Command/Query

Function		est enable register. The service request enable rned for the query. This is a common IEEE488.2
Command	*SRE n	
Query	*SRE?	
Response	n	
Parameter		 ESB MSS/RQS OPER Extended event status 2nd SG (EESB0) Extended event status 2nd SG (EESB1) Extended event status 1st SG (EESB2) Extended event status 1st SG (EESB3) MAV ESB MSS/RQS

Details	This is not initialized by the System Reset (Preset) command. This is initialized by Power On.
Example of Use	
	Enables the ESB service request. *SRE 32
	*SRE?
	>32

*STB?

Status Byte Register Query

Function			
	Returns	s the status byte	register value. This is a common IEEE488.2
	query.		
Query			
Query	*STB?		
	SID:		
Response			
·	n		
Parameter			
	n	Status byte reg	ister
	Value	= bit0 + bit1 + 1	$\operatorname{bit2} + \operatorname{bit3} + \operatorname{bit4} + \operatorname{bit5} + \operatorname{bit6} + \operatorname{bit7}$
		SCPI mode	
		$bit0$: $2^0 = 1$	Not used
		$bit1:2^1=2$	Not used
		$bit 2 : 2^2 = 4$	QUE
		bit $3 : 2^3 = 8$	QUES
		$bit 4 : 2^4 = 16$	MAV
		bit $5 : 2^5 = 32$	ESB
		$bit6: 2^6 = 64$	MSS/RQS
		$bit7: 2^7 = 128$	OPER
		Native mode	
		bit 0 : $2^0 = 1$	Extended event status 2nd SG (EESB0)
		$bit1:2^1=2$	Extended event status 2nd SG (EESB1)
		$bit 2 : 2^2 = 4$	Extended event status 1st SG (EESB2)
		$bit3: 2^3 = 8$	Extended event status 1st SG (EESB3)
		$bit4: 2^4 = 16$	MAV
		$bit5: 2^5 = 32$	ESB
		$bit6: 2^6 = 64$	MSS/RQS
		$bit7: 2^7 = 128$	Not used
	Range	0 to 255	
Example of Use			
	To quer	y the status byte	register value (when the ESB bit is 1)
	*STB?		
	>32		

*TRG	
Trigger Control	
Function	
	This command requests the trigger execution.
Command message	
	*TRG
Explanation	
	This command executes processing related to trigger input.
Example of Use	
	To execute trigger.
	*TRG Controller \rightarrow MG3710A/MG3710E/MG3740A

*TST?			
Self-Test Query Function			
	Returns	s the result of the	e self test. This is a common IEEE488.2 query.
Query			
	*TST?		
Response			
Response	n		
_			
Parameter	~		1.4
	n Value	Status byte reg = $hit0 + hit1 + 1$	nster bit2 + bit3 + bit4 + bit5 + bit6 + bit7
	value	$bit0: 2^0 = 1$	Not used
		bit $1 : 2^1 = 2$	Not used
		bit2 : $2^2 = 4$	
		bit3 : $2^{3} = 8$	RPP generation
		$bit4: 2^4 = 16$	Internal Reference Frequency Unlock
		bit5 : $2^5 = 32$	Not used
		$bit6: 2^6 = 64$	Internal Baseband Reference Clock Unlock
		$bit7: 2^7 = 128$	ALC Alarm
	Range	0 to 255	
Example of Use	т	.1 10.	
	*TST?	y the self test res	sult
	>0		
*WAI			
Wait-to-Continue Command			
Function	XX 7 · /		
		-	bcesses are complete before executing the next mon IEEE488.2 command.
	comman		mon 19994-00.2 command.
Command			
	*WAI		
Example of Use			
	To wait	for completion of	f measurement with *WAI
		-	'PackageName","PatternName"
			Loads a waveform pattern.
	*WAI		Waits until loading completes.
	RAD:AR	B:WMA:WAV "Pa	ackageName","PatternName"
			Selects a waveform pattern.

E.12 SCPI Device Message

This section describes SCPI device messages for status registers.

E.12.1 OPERation status register

The following table and figure show the layer structure of the OPERation Status Register.

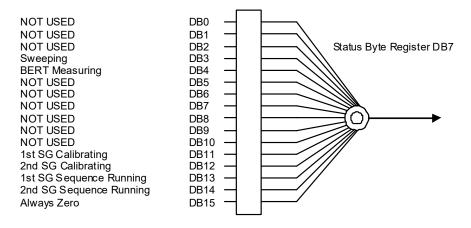


Figure E.12-1 OPERation Status Register

Bit Definition of OPERation Status Register		
DB3	Executing Sweep	
DB4	BERT measurement in progress	
DB11	Calibrating 1st SG	
DB12	Calibrating 2nd SG	
DB13	Executing 1st SG sequence mode	
DB14	Executing 2nd SG sequence mode	
DB15	Fix to 0.	

Table E.12-1 OPERation Status Register

Table E.12-2 lists device messages for the OPER ation Status Register.

	Table E.12-2	Device Messages Related to OPERation Status Register
--	--------------	--

Function	Device Message
Operation Status Register Event	:STATus:OPERation[:EVENt]?
Operation Status Register Condition	:STATus:OPERation:CONDition?
Operation Status Register	:STATus:OPERation:ENABle <integer></integer>
Enable	:STATus:OPERation:ENABle?
Operation Status Register	:STATus:OPERation:NTRansition <integer></integer>
Negative Transition	:STATus:OPERation:NTRansition?
Operation Status Register	:STATus:OPERation:PTRansition <integer></integer>
Positive Transition	:STATus:OPERation:PTRansition?
Status Preset	:STATus:PRESet

E.12.2 SCPI device message details

This section describes SCPI device messages for the OPERation status register.

:STATus:OPERation[:EVENt]?

Operation Status Register Event

Function

	This command queries the event register of the OPERation Status Register.		
Query	:STATus:OPERation	:EVENt]?	
Response	<integer></integer>		
Parameter			
	<integer></integer>	Bit sum of event register	
	Resolution	1	
	Range	0 to 65535	
Details			
	This command is available only in SCPI mode.		
Example of Use			
	To query the event register contents of the OPERation Status Register.		
	STAT: OPER?		
	> 0		

:STATus:OPERation:CONDition?

Operation Status Register Condition

Function	This command queries OPERation status regi	the content of the condition register of the ster.	
Query	:STATus:OPERation:	:CONDition?	
Response	<integer></integer>		
Parameter			
	<integer></integer>	Bit sum of condition register	
	Resolution	1	
	Range	0 to 65535	
Details			
	This command is available only in SCPI mode.		
Example of Use			
	To query the content of the condition register of the OPERation status		
	register.		
	STAT: OPER: COND?		
	> 0		

:STATus:OPERation:ENABle <integer>

Operation Status Register Enable

Function	This command sets the Register.	event enable register of the OPERation Status	
Command	:STATus:OPERation:	ENABle <integer></integer>	
Parameter			
	<integer></integer>	Bit sum of event enable register	
	Resolution	1	
	Range	0 to 65535	
Details			
	This command is availa	able only in SCPI mode.	
Example of Use			
	To set the event enable register of the OPERation status register to 16. STAT:OPER:ENAB 16		
:STATus:OPERation:E			
Operation Status Register Ena	ble Query		
Function			
	This command queries Register.	the event enable register of the OPERation Status	
Query			
	:STATus:OPERation:ENABle?		
Response			
	<integer></integer>		
Parameter			
	<integer></integer>	Bit sum of event enable register	
	Resolution	1	
	Range	0 to 65535	
Example of Use			
·	To query the event enable register of the OPERation Status Register.		

To query the event enable register of the OPERation Status Register. STAT:OPER:ENAB? > 16

:STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function				
	This command sets the transition filter (negative transition) of the OPERation status register.			
Command				
	:STATus:OPERation:	NTRansition <integer></integer>		
Parameter				
	<integer></integer>	Bit sum of transition filter (negative transition)		
	Resolution	1		
	Range	0 to 65535		
Details				
	This command is avail	able only in SCPI mode.		
Example of Use				
	To set the transition fil	ter (negative transition) of the OPERation status		
	register to 16.			
	STAT:OPER:NTR 16			
:STATus:OPERation:N	NTRansition?			
Operation Status Register Neg	ative Transition Query			
Function				
T difetion	This command queries	the transition filter (negative transition) of the		
	OPERation status regi			
Query				
	:STATus:OPERation:	NTRansition?		
Response				
	<integer></integer>			
Parameter				
	<integer></integer>	Bit sum of transition filter (negative transition)		
	Resolution	1		
	Range	0 to 65535		
Example of Use				
	To query the transiti	on filter (negative transition) of the OPERation		
	status register.			
	STAT:OPER:NTR?			
	> 16			

:STATus:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function	This command sets the OPERation status regis	transition filter (positive transition) of the ster.
Command	:STATus:OPERation:	PTRansition <integer></integer>
Parameter		
	<integer></integer>	Bit sum of transition filter (positive transition)
	Resolution	1
	Range	0 to 65535
Details	This command is availa	able only in SCPI mode.
Example of Use		
	To set the transition firegister to 16. STAT:OPER:PTR 16	lter (positive transition) of the OPERation status

:STATus:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function			
	This command queries OPERation status regis	the transition filter (positive transition) of the ster.	
Query	:STATus:OPERation:	PTRansition?	
Response	<integer></integer>		
Parameter			
Farameter	<integer> Resolution Range</integer>	Bit sum of transition filter (positive transition) 1 0 to 65535	
Example of Use			
	To query the transition status register. STAT:OPER:PTR? > 16	on filter (positive transition) of the OPERation	
:STATus:PRESet Status Preset			
Function		all of the transition filters, enable registers, errors	
Command	and event queue enable registers.		
	:STATus:PRESet		
Parameter	None		
Details	This command is availa	ble only in SCPI mode.	
Example of Use	To preset all of the tran queue enable registers. STAT:PRES	sition filters, enable registers, errors and event	

Appendix F Native Device Message Details

This chapter describes the compatible commands for controlling the MG3710A/MG3710E/MG3740A (hereafter "MG3710A/10E/40A") with the remote-control commands of the MG3700A. For the detailed specifications of each command, refer to MG3700A Vector Signal Generator Operational Manual (Mainframe) and "F.1 Native Device Message" of this manual.

F.1	Native	Device Messages	F-2
	F.1.1	Functions Device Messages Common to	
		Measurement Equipment	F-4
F.2	MG371	0A-MG3710E-MG3740A-MG3700A Commo	n
	Functio	ons	F-14
	F.2.1	MG3710A-MG3710E-MG3740A-MG3700A	
		Common Functions	F-14
F.3	Freque	ncy & Channel Function	F-18
	F.3.1	Frequency & Channel function	F-18
F.4	Level F	Function	F-23
	F.4.1	Level function	F-23
F.5	Modula	tion Functions	F-27
	F.5.1	Common to modulation functions	F-27
	F.5.2	Modulation	F-28
	F.5.3	Load pattern	F-35
	F.5.4	Ext I/O Setup	F-43
	F.5.5	I/Q tuning	F-47
	F.5.6	Edit HDD	F-50
	F.5.7	Sequence Progress	F-51
F.6	Utility F	Function	F-52
	F.6.1	Common to utility functions	F-52
	F.6.2	Save/Recall	F - 53
	F.6.3	BER Measurement	F-55
	F.6.4	BER Measurement	
		(Data Type Detail Setup)	F-61
	F.6.5	Alarm Monitor	F-64
	F.6.6	Interface Setup	F-6 6
	F.6.7	Network Setup	F-67
	F.6.8	Common Setup	F-70
	F.6.9	Maintenance Check	F-72
	F.6.10	Hardware Check	F-73
	F.6.11	Install	F-76
F.7	IEEE48	38.2 Common Commands	F-77
	F.7.1	Common to IEEE488.2	F-77

F.1 Native Device Messages

Described below are the commands that do not exist on the MG3700A when controlling the MG3710A/MG3710E/MG3740A using the MG3700 mode.

Function	Command	Query	Response	Remarks
Extended End Event Status Enable Register	ESE0 n	ESE0?	n	n = bit7 : Memory optimization
Extended End Event Status Register		ESR0?	n	<pre>check complete bit6 : Memory optimization complete bit5 : Not used bit4 : Waveform pattern loaded bit3 : Measurement complete bit2 : Level setting complete bit1 : Not used bit0 : Frequency setting complete</pre>
Extended Error Event Status Enable Register	ESE1 n	ESE1?	n	n = bit7 : Memory optimization
Extended Error Event Status Register		ESR1?	n	<pre>check error bit6 : Memory optimization error bit5 : Not used bit4 : Waveform pattern load error bit3 : Measurement error bit2 : Level setting error bit1 : Not used bit0 : Frequency setting error</pre>
Extended End Event Status Enable Register	ESE2 n	ESE2?	n	n = bit7 : Memory optimization
Extended End Event Status Register		ESR2?	n	<pre>check complete bit6 : Memory optimization complete bit5 : Not used bit4 : Waveform pattern loaded bit3 : Measurement complete bit2 : Level setting complete bit1 : Not used bit0 : Frequency setting complete</pre>

Table F.1-1 MG3710A-MG3710E-MG3740A-MG3700A Common Device Messages

F.1 Native Device Messages

Function	Command	Query	Response	Remarks
Extended Error Event Status Enable Register	ESE3 n	ESE3?	n	n = bit7 : Memory optimization
Extended Error Event Status Register		ESR3?	n	check error bit6 : Memory optimization error bit5 : Not used bit4 : Waveform pattern load error bit3 : Measurement error bit2 : Level setting error bit1 : Not used bit0 : Frequency setting error
Select SG	SELECTSG 1 2	SELECTSG?	n	n = SG No. 1 = SG1 2 = SG2

Table F.1-1 MG3710A-MG3710E-MG3740A-MG3700A Common Device Messages (Cont'd)

Appendix F Native Device Message Details

F.1.1 Functions Device Messages Common to Measurement Equipment

ESE0/ESE0?

Extended End Event Status Enable Register

	This command sets the extended end event status enable register of SG2. When an end event occurs, the end summary bit (ESB) value of the corresponding status byte register is set to 1 (true). The end event status enable register value of SG2 is returned for the query. This command does not exist on the MG3700A.		
Command	ESEO n		
Query	ESE0?		
Response	n		
Parameter	n Value Range Default	= bit0 + bit1 + bit0 : 20 = 1 bit1 : 21 = 2 bit2 : 22 = 4 bit3 : 23 = 8 bit4 : 24 = 16 bit5 : 25 = 32 bit6 : 26 = 64 bit7 : 27 = 128 0 to 255	vent status enable register (2nd SG) bit2 + bit3 + bit + bit5 + bit6 + bit7 Frequency setting complete (Not used) Level setting complete Measurement complete Waveform pattern loaded (Not used) Memory optimization complete Memory optimization check complete

Details

This command is available only in native mode.

Example of Use		
	To enable the	waveform pattern loaded and the level setting complete of
	2nd SG.	
	ESE0 20	
	ESE0?	
	> 20	
Related Command		
	ESR0?	Queries the extended end event status register of 2nd SG.

ESE1/ESE1?

Extended Error Event Status Enable Register

Function	This command sets the extended error event status enable register of 2nd SG. When an error event occurs, the error summary bit (ESB) value of the corresponding status byte register is set to 1 (true). The error event status enable register value of 2nd SG is returned for the query. This command does not exist on the MG3700A.		
Command	ESE1 n		
Query	ESE1?		
Response	n		
Parameter	n Value Range Default	= bit0 + bit1 + b bit0 : $20 = 1$ bit1 : $21 = 2$ bit2 : $22 = 4$ bit3 : $23 = 8$ bit4 : $24 = 16$ bit5 : $25 = 32$ bit6 : $26 = 64$ bit7 : $27 = 128$ 0 to 255	event status enable register (2nd SG) bit2 + bit3 + bit + bit5 + bit6 + bit7 Frequency setting error (Not used) Level setting error Measurement error Waveform pattern load error (Not used) Memory optimization error Memory optimization check error

Appendix F Native Device Message Details

Details				
	This command is available only in native mode.			
Example of Use				
	To enable the waveform pattern load error and the level setting error of			
	2nd SG.			
	ESE1 20			
	ESE1?			
	> 20			
Related Command				
	ESR1?	Queries the extended error event status register of 2nd SG.		

ESE2/ESE2?

Extended End Event Status Enable Register

Function

This command sets the extended end event status enable register of 1st SG. When an end event occurs at 1st SG, the end summary bit (ESB) value of the corresponding status byte register is set to 1 (true). The end event status enable register value of 1st SG is returned for the query.

Command			
	ESE2 n		
Query			
	ESE2?		
Response			
	n		
Parameter			
	n		event status enable register of 1st SG
	Value		bit2 + bit3 + bit + bit5 + bit6 + bit7
		bit0 : $2^0 = 1$	Frequency setting complete
		$bit1$: $2^1 = 2$	Not used
		$bit2 : 2^2 = 4$	Level setting complete
		bit3 : $2^{3} = 8$	End of measurement
		bit4 : $2^4 = 16$	Waveform pattern loaded
		bit5 : $2^5 = 32$	Not used
		$bit6: 2^6 = 64$	Memory optimization complete
		$bit7: 2^7 = 128$	Memory optimization check complete
	Range	0 to 255	
	Default	0	
Details			
Details	This con	mmand is availab	ble only in native mode.
	THIS COL	innanu is availat	sie only in native mode.
Example of Use			
	To enab	le the waveform	pattern loaded and the level setting complete of
	1st SG.		
	ESE2 2	0	
	ESE2?		
	> 20		
Related Command			
	ESR2?	Queries t	the extended end event status register of 1st SG.
		•	5

ESE3/ESE3?

Extended Error Event Status Enable Register

Function

This command sets the extended error event status enable register of 1st SG. When an error event occurs at 1st SG, the error summary bit (ESB) value of the corresponding status byte register is set to 1 (true). The error event status enable register value of 1st SG is returned for the query.

Command			
	ESE3 n		
Query			
	ESE3?		
Response			
	n		
Parameter			
	n]	Extended error	event status enable register of 1st SG.
	Value =	= bit0 + bit1 + b	pit2 + bit3 + bit + bit5 + bit6 + bit7
	ł	$bit0: 2^0 = 1$	Frequency setting error
	1	$bit1:2^1=2$	Not used
	1	$bit2:2^2=4$	Level setting error
	1	bit3 : $2^3 = 8$	Measurement error
	1	bit4 : $2^4 = 16$	Waveform pattern load error
	1	bit5 : $2^5 = 32$	Not used
	ł	$bit6: 2^6 = 64$	Memory optimization error
	ł	$bit7: 2^7 = 128$	Memory optimization check error
	Range (0 to 255	
	Default (0	
Details			
	This com	mand is availab	ole only in native mode.
Example of Use			
	To enable	e the waveform	pattern load error and the level setting error of
	1st SG.		
	ESE3 20		
	ESE3?		
	> 20		
Related Command			
	ESR3?	Queries SG.	the extended error event status register of 1st

ESR0?

Extended End Event Status Register Query

Function

This command queries the extended end event status register of 2nd SG. After the query, this register is reset to 0. This command does not exist on the MG3700A.

Query	_		
	ESR0?		
Response			
	n		
Parameter			
	n	Extended end e	event status register of 2nd SG
	Value	= bit0 + bit1 +	bit2 + bit3 + bit + bit5 + bit6 + bit7
		$bit0: 2^0 = 1$	Frequency setting complete
		$bit1$: $2^1 = 2$	Not used
		$bit2 : 2^2 = 4$	Level setting complete
		bit3 : $2^{3} = 8$	End of measurement
		bit4 : $2^4 = 16$	Waveform pattern loaded
		$bit5: 2^5 = 32$	Not used
		bit6 : $2^6 = 64$	Memory optimization complete
		bit7: $2^7 = 128$	Memory optimization check complete
	Range	0 to 255	
	Default	0	
Details			
	This con	nmand is availa	ble only in native mode.
Example of Use			
	To query ESR0?	y the extended e	nd event status register of 2nd SG.
	>1		Frequency setting complete
Related Command			
	ESE0?		Queries the extended end event status enable register of 2nd SG.

ESR1?

Extended Error Event Status Register Query

Function

This command queries the extended error event status register of 2nd SG. After the query, this register is reset to 0. This command does not exist on the MG3700A.

Query

ESR1?

Response

n

Parameter

Falamelei			
	n	Extended error	event status register of 2nd SG
	Value	= bit0 + bit1 + b	pit2 + bit3 + bit + bit5 + bit6 + bit7
		$bit0: 2^0 = 1$	Frequency setting error
		$bit1:2^1=2$	Not used
		$bit2: 2^2 = 4$	Level setting error
		bit3 : $2^{3} = 8$	Measurement error
		bit4 : $2^4 = 16$	Waveform pattern load error
		bit5 : $2^5 = 32$	Not used
		bit6 : $2^{6} = 64$	Memory optimization error
		$bit7: 2^7 = 128$	Memory optimization check error
	Range	0 to 255	
	Default	0	
Details			
	This com	ımand is availab	ole only in native mode.
Example of Use			
	To query	the extended en	rror event status register of 2nd SG.
	ESR1?		
	>1	Frequence	cy setting error
Related Command			
	ESE1?	Queries t 2nd SG.	he extended error event status enable register of

ESR2?

Extended End Event Status Register Query

Function

This command queries the extended end event status register of 1st SG. After the query, this register is reset to 0.

Query

ESR2?

Response

n

Parameter

Parameter			
	n	Extended end	event status register of 1st SG
	Value	= bit0 + bit1 +	bit2 + bit3 + bit + bit5 + bit6 + bit7
		$bit0$: $2^0 = 1$	Frequency setting complete
		$bit1:2^1=2$	Not used
		$bit2 : 2^2 = 4$	Level setting complete
		bit3 : $2^3 = 8$	End of measurement
		$bit4: 2^4 = 16$	Waveform pattern loaded
		$bit5:2^5=32$	Not used
		$bit6: 2^6 = 64$	Memory optimization complete
		$bit7: 2^7 = 128$	Memory optimization check complete
	Range	0 to 255	
	Default	0	
Details			
	This co	mmand is availa	ble only in native mode.
Example of Use			
		y the extended e	nd event status register of 1st SG.
	ESR2?		
	>1		Frequency setting complete
Related Command			
	ESE2?		Queries the extended end event status enable register of 1st SG.

ESR3?

Extended Error Event Status Register Query

Function

This command queries the extended error event status register of 1st SG. After the query, this register is reset to 0.

Query

ESR3?

Response

n

Parameter

Parameter			
	n	Extended error	event status register of 1st SG
	Value	= bit0 + bit1 + 1	bit2 + bit3 + bit + bit5 + bit6 + bit7
		$bit0: 2^0 = 1$	Frequency setting error
		$bit1:2^1=2$	Not used
		$bit2: 2^2 = 4$	Level setting error
		bit3 : $2^{3} = 8$	Measurement error
		$bit4: 2^4 = 16$	Waveform pattern load error
		$bit5: 2^5 = 32$	Not used
		$bit6: 2^6 = 64$	Memory optimization error
		$bit7: 2^7 = 128$	Memory optimization check error
	Range	0 to 255	
	Default	0	
Details			
	This con	nmand is availab	ole only in native mode.
Example of Use			
	To query ESR3?	v the extended en	rror event status register of 1st SG.
	>1	Frequence	cy setting error
Related Command			
	ESE3?	Queries 1 1st SG.	the extended error event status enable register of

SELECTSG/SELECTSG?

Select SG

Function		
		nmand selects the corresponding SG to be operated with the command.
		nmand does not exist on the MG3700A. It is used to select SG of 3710A/MG3710E/MG3740A.
	Setting range)	a numeric value other than "1" and "2" causes an error. (Out of
Command		
	SELECT	SG 1 2
Query	SELECT	902
	SETECI	36:
Response		
	n	
Parameter		
	n	No. of SG
	1	SG1
	2	SG2
	Default	1
Details		
Details	This cor	nmand is available only in native mode.
	11110 001	
Example of Use		
		t SG2 to be controlled
	SELECT	
	SELECT	SG?
	> 2	

F.2 MG3710A-MG3710E-MG3740A-MG3700A Common Functions

Note:

Column SG1/2 of the compatible list shows whether the behavior changes according to the SELECTSG command.

- $\sqrt{2}$ The SELECTSG command 1 is for SG1, and 2 is for SG2.
- N/A: Command not related to SG1/2.

F.2.1 MG3710A-MG3710E-MG3740A-MG3700A Common Functions

Given below is the compatible list of the functions device common to messages measurement equipment.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
DSPL ON OFF	\checkmark	DSPL ON OFF	N/A	Turns the display On/Off	:DisplayENABle ON OFF 1 0
DSPL?	\checkmark	DSPL?	N/A	Turns the display On/Off	:DISPlay:ENABle?
_	\checkmark	ESE0 <integer></integer>	N/A	Sets the extended status enable register For notification of the end of SG2; Not existing on the MG3700A.	_
_	\checkmark	ESE0?	N/A	Reads the extended status enable register For notification of the end of SG2; Not existing on the MG3700A.	_
_	\checkmark	ESE1 <integer></integer>	N/A	Sets the extended status enable register For notification of the error of SG2; Not existing on the MG3700A.	_

Table F.2.1-1 Compatible List of Device Messages Common to Applications

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
_	\checkmark	ESE1?	N/A	Reads the extended status enable register For notification of the error of SG2; Not existing on the MG3700A.	_
ESE2 n	\checkmark	ESE2 <integer></integer>	N/A	Sets the extended status enable register For notification of the end of SG1	_
ESE2?		ESE2?	N/A	Reads the extended status enable register For notification of the end of SG1.	_
ESE3 n		ESE3 <integer></integer>	N/A	Sets the extended status enable register For notification of SG1 errors	_
ESE3?		ESE3?	N/A	Reads the extended status enable register For notification of SG1 errors	_
_	\checkmark	ESR0?	N/A	Sets the extended status register For notification of the end of SG2; Not existing on the MG3700A.	_
_	\checkmark	ESR1?	N/A	Sets the extended status register For notification of the error of SG2; Not existing on the MG3700A.	_
ESR2?		ESR2?	N/A	Sets the extended status register For notification of the end of SG1.	_
ESR3?		ESR3?	N/A	Sets the extended status register For notification of SG1 errors	_

Table F.2.1-1 Compatible List of Device Messages Common to Applications (Cont'd)

Table F.2.1-1 Compatible List of Device Messages Common to Applications (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
HEAD ON OFF	\checkmark	HEAD ON OFF	N/A	Header of the response message When the Language Mode is MG3700A and this function is turned on, inserts in capital letters all character strings of the header section of the query input by the user. Adds no header section to the response of the IEEE488.2 common commands such as *IDN? even if the HEAD is on.	_	
HEAD?	\checkmark	HEAD?	N/A	Header of the response message	_	
KNOBHOLD ON OFF	\checkmark	KNOBHOLD ON OFF	N/A	Holds the rotary knob.	:SYSTem:KNOB:HOLD <boolean></boolean>	
KNOBHOLD?	\checkmark	KNOBHOLD?	N/A	Holds the rotary knob	:SYSTem:KNOB:HOLD?	
PRE	\checkmark	PRE	N/A	System Preset	:SYSTem:PRESet	
SCOPY	\checkmark	SCOPY [<string>,[<device>]]</device></string>	N/A	Copies the screen Device specified with SCRCPYMEDIA when <device> is omitted The formats to be used are those currently set with the following: :MMEMory:STORe:SCReen:MODE BMP PNG</device>	:MMEMory:STORe:SCRe en [<filename>[,<devic e>]]</devic </filename>	
ERRMSG?	V	ERRMSG?	N/A	Obtains only the error occurred immediately before	:SYSTem:ERRor[:NEXT]?	

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN?	\checkmark	SCREEN?	N/A	Current screen Returns the options set immediately before with the SCREEN command The default is FREQ_TOP.	_
_	V	SELECTSG 1 2	N/A	Selects the corresponding SG to be operated with the remote command. A command that does not exist on the MG3700A. Used to select SG of the MG3710A/10E/40A. Setting a numeric value other than "1" and "2" causes an error. (Out of range)	[:SOURce]:PORT 1 2
_	V	SELECTSG?	N/A	Queries the corresponding SG to be operated with the remote command. Command that does not exist on the MG3700A Queries the selected status of SG of the MG3710A/10E/40A	[:SOURce]:PORT?

Table F.2.1-1 Compatible List of Device Messages Common to Applications (Cont'd)

F.2

F.3 Frequency & Channel Function

F.3.1 Frequency & Channel function

Given below is the compatible list of the frequency & channel functions device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN FREQ_TOP	\checkmark	SCREEN FREQ_TOP	N/A	Moves to the frequency screen This command is accepted but the screen is not moved.	-
FREQ f		FREQ <freq></freq>	\checkmark	Sets frequency	[:SOURce[1] 2]:FREQ uency[:CW :FIXed] <freq></freq>
FREQ?	\checkmark	FREQ?	\checkmark	Sets frequency	[:SOURce[1] 2]:FREQ uency[:CW :FIXed]?
BPADISP FREQ CH	\checkmark	BPADISP FREQ CH	\checkmark	Switches between frequency and channel	[:SOURce[1] 2]:FREQ uency:TYPE FREQuency CHANnel
BPADISP?	\checkmark	BPADISP?	\checkmark	Switches between frequency and channel	[:SOURce[1] 2]:FREQ uency:TYPE?
FRS UP DN DOWN	\checkmark	FRS UP DN DOWN	\checkmark	Steps up/down the frequency	[:SOURce[1] 2]:FREQ uency[:CW :FIXed] UP DOWN
FIS f	\checkmark	FIS <freq></freq>	\checkmark	Increments the step of the frequency	[:SOURce[1] 2]:FREQ uency:STEP[:INCReme nt] <freq></freq>

 Table F.3.1-1 Compatible List of Frequency & Channel Functions Device Messages

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
	I				[:SOURce[1] 2]:FREQ
FIS?	\checkmark	FIS?	\checkmark	Increments the step of the frequency	<pre>uency:STEP[:INCReme nt]?</pre>
FREQSWSPEED NORMAL FAST	N/A		N/A	Frequency switching speed	
FREQSWSPEED?	N/A		N/A	Frequency switching speed	
SPREV ON REV INV O FF NORMAL	\checkmark	SPREV ON REV INV OFF NORMAL	V	RF spectrum	[:SOURce[1] 2]:DM:P OLarity[:ALL] NORMal INVert
SPREV?	\checkmark	SPREV?	\checkmark	RF spectrum	[:SOURce[1] 2]:DM:P OLarity[:ALL]?
REF?	\checkmark	REF?	N/A	Queries the frequency reference Response: INT, EXT	_
PLLCOND?	\checkmark	PLLCOND?	N/A	Queries the PLL Condition Response: NORMAL, OVENCOND, ALARM, CHKEXT	_
SCREEN FREQ_PHASE	\checkmark	SCREEN FREQ_PHASE	N/A	Moves to the RF output phase adjustment screen. This command is accepted but the screen is not moved	_
RFPHASE d	\checkmark	RFPHASE <phase></phase>	\checkmark	RF output phase	<pre>[:SOURce[1] 2]:PHAS e[:ADJust] <ext numeric=""></ext></pre>
RFPHASE?	\checkmark	RFPHASE?	\checkmark	RF output phase	[:SOURce[1] 2]:PHAS e[:ADJust]?
SCREEN CHAN_TOP		SCREEN CHAN_TOP	N/A	Moves to the channel screen This command is accepted but the screen is not moved.	_

 Table F.3.1-1
 Compatible List of Frequency & Channel Functions Device Messages (Cont'd)

Table F.3.1-1 Compatible List of Frequency & Channel Functions Device Messages (Cont'd)					
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN CHAN_EDIT	\checkmark	SCREEN CHAN_EDIT	N/A	Moves to the channel edit screen This command is accepted but the screen is not moved.	_
CH n	\checkmark	CH <ext_integer></ext_integer>	\checkmark	Sets the channel number.	[:SOURce[1] 2]:FREQ uency:CHANnels:NUMB er <ext_integer></ext_integer>
CH?	\checkmark	CH?	\checkmark	Sets the channel number.	[:SOURce[1] 2]:FREQ uency:CHANnels:NUMB er?
CHS UP DN DOWN		CHS UP DN DOWN	\checkmark	Up/Down of the step of the channel Increases by 1 or decreases by 1	
CHFDISP ON OFF	\checkmark	CHFDISP ON OFF	\checkmark	Frequency display	[:SOURce[1] 2]:FREQ uency:CHANnels:DISP lay <boolean></boolean>
CHFDISP?		CHFDISP?	\checkmark	Frequency display	[:SOURce[1] 2]:FREQ uency:CHANnels:DISP lay?
CHGRPSEL n	\checkmark	CHGRPSEL <ext_integer></ext_integer>	\checkmark	Sets the channel group Setting this when no channel group exists causes an error	[:SOURce[1] 2]:FREQ uency:CHANnels:GROu p <ext integer=""></ext>
CHGRPSEL?	V	CHGRPSEL?	\checkmark	Sets the channel group Querying when no group is selected causes an error	[:SOURce[1] 2]:FREQ uency:CHANnels:GROu p?

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
CHTBLALLCLR	\checkmark	CHTBLALLCLR	\checkmark	Entirely clears the channel table	[:SOURce[1] 2]:FREQ uency:CHANnels:DELe te:ALL
CHTBL n1,s,n2,n3,f 1,f2	V	CHTBL <ext_integer1>,<strin g>,<ext_integer2>,<ex t_integer3>,<freq1>,< freq2></freq1></ex </ext_integer2></strin </ext_integer1>	\checkmark	Edits the channel table	<pre>[:SOURce[1] 2]:FREQ uency:CHANnels:EDIT <ext_integer1>,<str ing>,<ext_integer2> ,<ext_integer3>,<fr eq1>,<freq2></freq2></fr </ext_integer3></ext_integer2></str </ext_integer1></pre>
CHTBL? nl	\checkmark	CHTBL? <ext_integer></ext_integer>	\checkmark	Edits the channel table	[:SOURce[1] 2]:FREQ uency:CHANnels:EDIT ?
CHTBLDEL n	\checkmark	CHTBLDEL <ext_integer></ext_integer>	\checkmark	Clears the channel table	[:SOURce[1] 2]:FREQ uency:CHANnels:DELe te <integer></integer>
CHFILESAVE s		CHFILESAVE <string>[,<device>]</device></string>	\checkmark	Stores the channel table Device specified by CHMEDIA when the device is omitted	:MMEMory<1 2>:STORe :FREQuency:CHANnels <string>[,<device>]</device></string>
CHFILERECALL s	\checkmark	CHFILERECALL <string>[,<device>]</device></string>	\checkmark	Reads the channel table Device specified by CHMEDIA when the device is omitted	:MMEMory<1 2>:LOAD: FREQuency:CHANnels <string>[,<device>]</device></string>

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
CHCURFILE?	V	CHCURFILE?	\checkmark	Obtains the name of the channel table file Returns the name of the current channel table file When the channel table file is saved/recalled, changes the name accordingly. Default: ChTable (tentative name)	_
CHMEDIA HDD CF	N	CHMEDIA HDD SHDD CF	V	Selects the media in which the channel table is to be stored/read C drive when HDD is selected D drive when SHDD is selected (enabled only when the 2nd HDD option is installed; otherwise causes an error). Devices other than HDD whose drive letter is the youngest when CF is selected Default: HDD	_
CHMEDIA?		CHMEDIA?		Selects the media to store/read the channel table Returns CF for drives other than C and 2nd HDD	_

F.4 Level Function

F.4.1 Level function

Given below is the compatible list of the level function device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN LVL_TOP	\checkmark	SCREEN LVL_TOP	N/A	Moves to the level screen This command is accepted but the screen is not moved	_
LVL ON OFF	\checkmark	LVL ON OFF		Turns the RF output On/Off	:OUTPut[1] 2[:STATe] <boolean></boolean>
LVL?	\checkmark	LVL?		Turns the RF output On/Off	:OUTPut[1] 2[:STATe]?
OLVL l	\checkmark	OLVL <ampl></ampl>	V	RF output level	<pre>[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e][:AMPLitude] <ampl></ampl></pre>
OLVL? [DBM DBU]	\checkmark	OLVL? [DBM DBU]	V	RF output level Reads by specifying the unit Uses the unit specified by VDSPL, when DBU is selected	_
OLS UP DN DOWN	V	OLS UP DN DOWN	V	Increases/Decreases the step of the RF output level	[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e][:AMPLitude] UP DOWN

Table F 4 1-1	Compatible List of Level Function Device Messages
	Companye List of Level I unction Device messages

F.4 Level Function

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	evel Functions Device Messages (Cont'd) Remarks	MG3710A/10E/40A Commands (SCPI mode)
OLU DBM DBU	V	OLU DBM DBU	\checkmark	Switches the unit of the level Uses the unit specified by VDSPL, when DBU is selected Default: DBM	:UNIT[1] 2:POWer DBM DBUV DBUVEMF
OLU?	\checkmark	OLU?	\checkmark	Switches the unit of the level	:UNIT[1] 2:POWer?
VDSPL EMF TERM	V	VDSPL EMF TERM	V	Sets the voltage display Switches the unit of display to the one specified by VDSPL, where OLU is DBU Makes no switching but leaves the display as dBm, where OLU is DBM Default EMF	:UNIT[1] 2:POWer DBM DBUV DBUVEMF
VDSPL?	\checkmark	VDSPL?	\checkmark	Sets the voltage display	:UNIT[1] 2:POWer?
005 1	V	OOS <rel_ampl></rel_ampl>	\checkmark	Sets the offset output level	<pre>[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e]:OFFSet <rel_ampl></rel_ampl></pre>
005?	\checkmark	005?	\checkmark	Sets the offset output level	<pre>[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e]:OFFSet?</pre>
OOF ON OFF	V	OOF ON OFF	\checkmark	Turns the offset on/off	<pre>[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e]:OFFSet:STATe <boolean></boolean></pre>

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
OOF?	\checkmark	OOF?	\checkmark	Turns the offset on/off	<pre>[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e]:OFFSet:STATe?</pre>
ORL ON OFF	\checkmark	ORL ON OFF	\checkmark	Turns the relative level on/off	[:SOURce[1] 2]:POWe r:REFerence:STATe <boolean></boolean>
ORL?	\checkmark	ORL?	\checkmark	Turns the relative level on/off	[:SOURce[1] 2]:POWe r:REFerence:STATe?
OCNT ON OFF	\checkmark	OCNT ON OFF	\checkmark	Continuous mode (ATT Hold)	[:SOURce[1] 2]:POWe r:ATTenuation:AUTO <boolean></boolean>
OCNT?	\checkmark	OCNT?		Continuous mode (ATT Hold)	[:SOURce[1] 2]:POWe r:ATTenuation:AUTO?
OIS 1	~	OIS <rel_ampl></rel_ampl>	V	Increments the step level	[:SOURce[1] 2]:POWe r[:LEVel][:IMMediat e]:STEP[:INCRement] <rel ampl=""></rel>
OIS?	~	OIS?	V	Increments the step level	[:SOURCe[1] 2]:POWe r[:LEVel][:IMMediat e]:STEP[:INCRement] ?
CAL	\checkmark	CAL	V	Executes the level calibration	[:SOURce[1] 2]:POWe r:ALC:SEARch [ONCE]

Table F.4.1-1 Compatible List of Level Functions Device Messages (Cont'd)

F.4

F-25

Level Function

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	evel Functions Device Messages (Cont'd) Remarks	MG3710A/10E/40A Commands (SCPI mode)
ORLR?		ORLR?		Relative reference level	[:SOURce[1] 2]:POWe r:REFerence?
ORLV 1	\checkmark	ORLV <rel_ampl></rel_ampl>	\checkmark	Relative output level	[:SOURce[1] 2]:POWe r:REFerence:AMPLitu de <rel_ampl></rel_ampl>
ORLV?	\checkmark	ORLV?		Relative output level	[:SOURce[1] 2]:POWe r:REFerence:AMPLitu de?
EXTALC ON OFF	N/A	-	_	Switches the external ALC mode Supported by the 2nd step and after	-
EXTALC?	N/A	-	_	Switches the external ALC mode Supported by the 2nd step and after	_
ALCSTT?		ALCSTT?		Obtains the ALC status	[:SOURce[1] 2]:POWe r:ALC:ERRor?
LVLACCSTT?	V	LVLACCSTT?	\checkmark	Obtains the level accuracy status Regards as unleveled, when the [:SOURce[1] 2]:POWer:UNLeveled:ERRor? is other than NORM.	[:SOURce]:UNLeveled :ERRor?
ATTCHKSTT?	\checkmark	ATTCHKSTT?	\checkmark	Obtains the attenuator wearing status	-
LVLSTTLST?	\checkmark	LVLSTTLST?	\checkmark	Level output status	-

Appendix F Native Device Message Details

F.5 Modulation Functions

F.5.1 Common to modulation functions

Given below is the compatible list of device messages common to modulation functions

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN BB_TOP	\checkmark	SCREEN BB_TOP	N/A	Moves to the modulation function screen This command is accepted but the screen is not moved	_
BBREFCOND?	V	BBREFCOND?	V	BB Reference Clock Condition NORMAL :Int lock or Ext lock UNLOCK :Int unlock CHKEXT :Ext unlock	[:SOURce[1] 2]:RADi o:ARB:CLOCk:REFeren ce:ERRor?

Table F.5.1-1	Compatible List of Device Messages Common to Modulation Functions
	compatible List of Device messages common to modulation i anotheris

F.5.2 Modulation

Given below is the compatible list of the modulation device messages.

Table F.5.2-1	Compatible List of Modulation Device Messages
---------------	---

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN BB_ADVANCE	\checkmark	SCREEN BB_ADVANCE	N/A	Moves to the Advanced Menu screen This command is accepted but the screen is not moved.	_
DLRES	\checkmark	DLRES	\checkmark	Waveform Restart	[:SOURce[1] 2]:RADi o:ARB:WAVeform:REST art
LOADEDFILESEL WMA,s1,s2	\checkmark	LOADEDFILESEL WMA, <string1>,<string 2></string </string1>	\checkmark	Selects waveform files	[:SOURce[1] 2]:RADi o:ARB:WMA:WAVeform <string1>,<string2></string2></string1>
LOADEDFILESEL? WMA	\checkmark	LOADEDFILESEL? WMA	\checkmark	Selects waveform files	[:SOURce[1] 2]:RADi o:ARB:WMA:WAVeform?
LOADEDFILESEL WMB,s1,s2	\checkmark	LOADEDFILESEL WMB, <string1>,<string 2></string </string1>	\checkmark	Selects waveform files	[:SOURce[1] 2]:RADi o:ARB:WMB:WAVeform <string1>,<string2></string2></string1>
LOADEDFILESEL? WMB	\checkmark	LOADEDFILESEL? WMB	\checkmark	Selects waveform files	[:SOURce[1] 2]:RADi o:ARB:WMB:WAVeform?

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
LOADEDFILESEL		LOADEDFILESEL			[:SOURce[1] 2]:RADi
LONG,s1,s2	\checkmark	LONG, <string1>,<strin< td=""><td>\checkmark</td><td>Selects waveform files</td><td>o:ARB:LONG:WAVeform</td></strin<></string1>	\checkmark	Selects waveform files	o:ARB:LONG:WAVeform
LONG,51,52		g2>			<string1>,<string2></string2></string1>
LOADEDFILESEL?					[:SOURce[1] 2]:RADi
LONG	\checkmark	LOADEDFILESEL? LONG	\checkmark	Selects waveform files	o:ARB:LONG:WAVeform
TONG					?
		LOADEDFILESEL			[:SOURce[1] 2]:RADi
LOADEDFILESEL		COMB, <string1>,<string< td=""><td>\checkmark</td><td>Selects waveform files</td><td>o:ARB:COMBination:W</td></string<></string1>	\checkmark	Selects waveform files	o:ARB:COMBination:W
CONB,s1,s2	v	2>	v	Selects wavelorm mes	AVeform
		27			<string1>,<string2></string2></string1>
LOADEDFILESEL?					[:SOURce[1] 2]:RADi
COMB		LOADEDFILESEL? COMB	\checkmark	Selects waveform files	o:ARB:COMBination:W
COMB					AVeform?
					[:SOURce[1] 2]:RADi
					o:ARB:WMA WMB:WAVef
		PAT		Selects waveform files	orm
PAT a,s1,s2	\checkmark	WMA WMB LONG COMB, <st< td=""><td>\checkmark</td><td>Operates similarly as the</td><td><stringl>,<string2></string2></stringl></td></st<>	\checkmark	Operates similarly as the	<stringl>,<string2></string2></stringl>
		ring1>, <string2></string2>		LOADEDFILESELcommand	[:SOURce[1] 2]:RADi
					o:ARB:WAVeform
					<string1>,<string2></string2></string1>

 Table F.5.2-1
 Compatible List of Modulation Device Messages (Cont'd)

Table F.5.2-1 Compatible List of Modulation Device Messages (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
					[:SOURce[1] 2]:RADi	
				Selects waveform files	o:ARB:WMA WMB:WAVef	
PAT? a	\checkmark	PAT? WMA WMB LONG COMB	\checkmark	Operates similarly as the	orm?	
				LOADEDFILESELcommand	[:SOURce[1] 2]:RADi o:ARB:WAVeform?	
					[:SOURce[1] 2]:RADi	
PATCOMBMODE	\checkmark	PATCOMBMODE	\checkmark	Pattern Addition	o:ARB:PCOMbination	
EDIT DEFINED		EDIT DEFINED			EDIT DEFined	
	.1				[:SOURce[1] 2]:RADi	
PATCOMBMODE?	\checkmark	PATCOMBMODE?		Pattern Addition	o:ARB:PCOMbination?	
		PATSOF <ext_integer></ext_integer>	V		[:SOURce[1] 2]:RADi	
PATSOF n	\checkmark			Start Offset	o:ARB:TIME:SOFFset	
					<ext_integer></ext_integer>	
			1		[:SOURce[1] 2]:RADi	
PATSOF?	N	PATSOF?	\checkmark	Start Offset	o:ARB:TIME:SOFFset?	
					[:SOURce[1] 2]:RADi	
PATWMALVL l	\checkmark	PATWMALVL <ampl></ampl>		Pattern (WM(A)) Level	o:ARB:WMA:POWer	
					<ampl></ampl>	
				Pattern (WM(A)) Level		
		PATWMALVL?	.1	Reads by specifying the unit	[:SOURce[1] 2]:RADi	
PATWMALVL?	V	[DBM DBU DBUT]		DBM $:$ dBm, dBU $:$ dB μ V(EMF), dBut $:$	o:ARB:WMA:POWer?	
				dBµV(TERM)		

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
PATWMBLVL l	N	PATWMBLVL <ampl></ampl>	\checkmark	Pattern (WM(B)) Level Does not depend on the AWGN converted value.	[:SOURce[1] 2]:RADi o:ARB:WMB:POWer <ampl></ampl>
PATWMBLVL?	\checkmark	PATWMBLVL? [DBM DBU DBUT]	\checkmark	Pattern (WM(B)) Level Reads by specifying the unit DBM : dBm, DBU : dBµV(EMF), DBUT : dBµV(TERM)	[:SOURce[1] 2]:RADi o:ARB:WMB:POWer?
PATWMBDLVL 1	\checkmark	PATWMBDLVL <ampl></ampl>	\checkmark	Pattern (WM(B')) Level Does not depend on the AWGN converted value.	[:SOURce[1] 2]:RADi o:ARB:WMB:POWer <ampl></ampl>
PATWMBDLVL?	\checkmark	PATWMBDLVL? [DBM DBU DBUT]	\checkmark	Pattern (WM(B')) Level Reads by specifying the unit DBM : dBm, DBU : dBµV (EMF), DBUT : dBµV (TERM)	[:SOURce[1] 2]:RADi o:ARB:WMB:POWer?
PATWMOUT WMA WMB WMAB	V	PATWMOUT WMA WMB WMAB OFF	\checkmark	Output WMA, WMB	[:SOURce[1] 2]:RADi o:ARB:WMA WMB:OUTPu t <boolean></boolean>
PATWMOUT?	V	PATWMOUT?	\checkmark	Output WMA, WMB	[:SOURce[1] 2]:RADi o:ARB:WMA WMB:OUTPu t?
POWRATIOTARGET WMA WMB CONSTANT	\checkmark	POWRATIOTARGET WMA WMB CONSTANT	\checkmark	For setting the A/B output ratio	[:SOURce]:ARB:POWer :RATio:TARGet A B A
POWRATIOTARGET?	\checkmark	POWRATIOTARGET?	\checkmark	For setting the A/B output ratio	[:SOURce[1] 2]:RADi o:ARB:POWer:RATio:T ARGet?

Table F.5.2-1 Compatible List of Modulation Device Messages (Cont'd)

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
PATWMPOWRATIO 1	\checkmark	PATWMPOWRATIO <rel_ampl></rel_ampl>		A/B output ratio	[:SOURce[1] 2]:RADi o:ARB:POWer:RATio
PATWMPOWRATIO?	√	PATWMPOWRATIO?		A/B output ratio	<pre><rel_ampl> [:SOURce[1] 2]:RADi o:ARB:POWer:RATio?</rel_ampl></pre>
PATWMFOF f	\checkmark	PATWMFOF <freq></freq>	V	Frequency Offset Changes the frequency offset of side A	[:SOURce[1] 2]:RADi o:ARB:FREQuency:OFF Set <freg></freg>
PATWMFOF?	\checkmark	PATWMFOF?		Frequency Offset Changes the frequency offset of side A	[:SOURce[1] 2]:RADi o:ARB:FREQuency:OFF Set?
PATWMAFOF f	\checkmark	PATWMAFOF <freq></freq>		Frequency Offset Changes the frequency offset of side A	[:SOURce[1] 2]:RADi o:ARB:FREQuency:OFF Set <freg></freg>
PATWMAFOF?	\checkmark	PATWMAFOF?		Frequency Offset Changes the frequency offset of side A	[:SOURce[1] 2]:RADi o:ARB:FREQuency:OFF Set?
PATRUNSTT?	\checkmark	PATRUNSTT?		Pattern regeneration status	[:SOURce[1] 2]:RADi o:ARB:REGister[:STA Tus]?
SAMPLINGCLK f	\checkmark	SAMPLINGCLK <freq></freq>		Sampling Clock Changes the sampling rate of side A	[:SOURce[1] 2]:RADi o:ARB:WMA:SCLock:RA TE <freq></freq>
SAMPLINGCLK?	\checkmark	SAMPLINGCLK?	V	Sampling Clock Changes the sampling rate of side A	[:SOURce[1] 2]:RADi o:ARB:WMA:SCLock:RA TE?

				Ddulation Device Messages (Cont'd)	
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
LPF a	\checkmark	LPF AUTO THROUGH 100KHZ 3 00KHZ 1MHZ 3MHZ 10MHZ 30MHZ 70MHZ	\checkmark	Low Pass Filter Setting is accepted, but no operational effect occurs Default: AUTO	_
LPF?	\checkmark	LPF?	\checkmark	Low Pass Filter Setting is accepted, but no operational effect occurs.	_
RMSVAL 1	\checkmark	RMSVAL <rel_ampl></rel_ampl>	\checkmark	RMS Value Tuning	[:SOURce[1] 2]:RADi o:ARB:RMSTuning <rel_ampl></rel_ampl>
RMSVAL?	\checkmark	RMSVAL?	\checkmark	RMS Value Tuning	[:SOURce[1] 2]:RADi o:ARB:RMSTuning?
CENTERSIG WMA WMB	\checkmark	CENTERSIG WMA WMB BDC	\checkmark	Center Signal	[:SOURce[1] 2]:RADi o:ARB:CSIGnal A B BDC
CENTERSIG?	\checkmark	CENTERSIG?	\checkmark	Center Signal	[:SOURce[1] 2]:RADi o:ARB:CSIGnal?
DMOD ON OFF	V	DMOD ON OFF	\checkmark	Modulation On/Off	:OUTPut[1] 2:MODula tion[:STATe] <boolean></boolean>
DMOD?	\checkmark	DMOD?	\checkmark	Modulation On/Off	:OUTPut[1] 2:MODula tion[:STATe]?
IQSRC INT EXT	\checkmark	IQSRC INT EXT	\checkmark	IQ Source INT :Internal, EXT :Analog I/Q In	[:SOURce[1] 2]:DM:S OURce INTernal AEXTernal

Table F.5.2-1 Compatible List of Modulation Device Messages (Cont'd)

MG3700A	Com-	MG3710A/10E/40A Commands	SG 1/2	Remarks	MG3710A/10E/40A Commands
Commands	patibility	(MG3700 mode)	1/2		(SCPI mode)
IQSRC?	\checkmark	IQSRC?	\checkmark	IQ Source	[:SOURce[1] 2]:DM:S OURce?
MODE INT EXT	\checkmark	MODE INT EXT	\checkmark	IQ Source	[:SOURce[1] 2]:DM:S OURce INTernal AEXTernal
MODE?	\checkmark	MODE?	\checkmark	IQ Source	[:SOURce[1] 2]:DM:S OURce?
IQOUT ON OFF	\checkmark	IQOUT ON OFF	V	IQ output ON: Analog I/Q Out, OFF :RF	[:SOURce[1] 2]:DM:O UTPut RFOut AEXTernalRFA RFD
IQOUT?	\checkmark	IQOUT?	\checkmark	IQ output ON: Analog I/Q Out, OFF :RF	[:SOURce[1] 2]:DM:O UTPut?
SMPLCLKMATCH?	\checkmark	SMPLCLKMATCH?	\checkmark	Sampling Clock Warning of mismatch	[:SOURce[1] 2]:RADi o:ARB:RMATching:ERR or?

F.5.3 Load pattern

Given below is the compatible list of Load Pattern device messages.

Table F.5.3-1 Compatible List of Load Pattern Device Messages	Table F.5.3-1	Compatible List of Load Pattern Device Messages
---	---------------	---

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN BB_LOADPT	\checkmark	SCREEN BB_LOADPT	N/A	Moves to the Load Pattern to Memory screen This command is accepted but the screen is not moved.	_
LDFILE WMA,s1,s2	V	LDFILE WMA, <string1>,<string2>[,<d evice>]</d </string2></string1>	V	Loads waveform files Asynchronous command C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:WMA <string1>,<string2> [,<device>]</device></string2></string1>
LDFILE? WMA	\checkmark	LDFILE? WMA, <string1>,<string2>[,<d evice>]</d </string2></string1>	V	Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:WMA? <string1>,<string2> [,<device>]</device></string2></string1>
LDFILE WMB,s1,s2	\checkmark	LDFILE WMB, <string1>,<string2>[,<d evice>]</d </string2></string1>	V	Loads waveform files Asynchronous command C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:WMB <string1>,<string2> [,<device>]</device></string2></string1>
LDFILE? WMB	\checkmark	LDFILE? WMB, <string1>,<string2>[,<d evice>]</d </string2></string1>	V	Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:WMB? <string1>,<string2> [,<device>]</device></string2></string1>
LDFILE LONG,s1,s2	V	LDFILE LONG, <string1>,<string2>[,<d evice>]</d </string2></string1>		Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:LONG <string1>,<string2> [,<device>]</device></string2></string1>

F.5 Modulation Functions

H	
Co.	
0	

Table F.5.3-1 Compatible List of Load Pattern Device Messages (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
LDFILE? LONG	\checkmark	LDFILE? LONG, <string1>,<string2>[,<d evice>]</d </string2></string1>	V	Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:LONG? <string1>,<string2> [,<device>]</device></string2></string1>	
LDFILE COMB,s1,s2	V	LDFILE CONB, <string1>,<string2>[,<d evice>]</d </string2></string1>	\checkmark	Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:COMBinatio n <string1>,<string2> [,<device>]</device></string2></string1>	
LDFILE? COMB	V	LDFILE? CONB, <string1>,<string2 >[,<device>]</device></string2 </string1>	\checkmark	Loads waveform files C, when <device> is omitted</device>	:MMEMory[1] 2:LOAD: WAVeform:COMBinatio n? <string1>,<string2> [,<device>]</device></string2></string1>	
LDPAT a,s1,s2	V	LDPAT WMA WMB LONG COMB, <strin g1>,<string2>[,<device>]</device></string2></strin 	V	Loads waveform files C, when <device> is omitted Operates similarly as LOADEDFILESEL command</device>	:MMEMory[1] 2:LOAD: WAVeform:WMA <string1>,<string2> [,<device>] :MMEMory[1] 2:LOAD: WAVeform:WMB <string1>,<string2> [,<device>] :MMEMory[1] 2:LOAD: WAVeform <string1>,<string2> [,<device>]</device></string2></string1></device></string2></string1></device></string2></string1>	

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
LDPAT?	\checkmark	LDPAT? WMA WMB LONG COMB, <stri ng1>,<string2>[,<device >]</device </string2></stri 	V	Loads waveform files C, when <device> is omitted Operates similarly as LOADEDFILESEL command</device>	<pre>:MMEMory[1] 2:LOAD: WAVeform:WMA? <string1>,<string2> [,<device>] :MMEMory[1] 2:LOAD: WAVeform:WMB? <string1>,<string2> [,<device>] :MMEMory[1] 2:LOAD: WAVeform? <string1>,<string2> [,<device>]</device></string2></string1></device></string2></string1></device></string2></string1></pre>
SEQFILELDCHK s1, s2	√	SEQFILELDCHK <string1>,<string2>[,<d evice>]</d </string2></string1>	√	Confirms whether or not loading of combination files for the sequence mode is enabled Synchronous command C, when <device> is omitted Confirms whether or not loading of combination</device>	_
SEQFILELDCHK?	√	SEQFILELDCHK?	√ √	files for the sequence mode is enabled. Cancels loading of the waveform file to the memory	- :MMEMory[1] 2:LOAD: WAVeform:ABORt

 Table F.5.3-1
 Compatible List of Load Pattern Device Messages (Cont'd)

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
LOADEDFILENAME? WMA WMB LONG CO MB,n	\checkmark	LOADEDFILENAME? WMA WMB LONG COMB, <ext_integer></ext_integer>	\checkmark	Queries the name of the loaded waveform file	:MEMory[1] 2:WAVefo rm:WMA:NAME? <ext_integer> :MEMory[1] 2:WAVefo rm:WMB:NAME?</ext_integer>
					<ext_integer> :MEMory[1] 2:WAVefo rm:NAME? <ext_integer></ext_integer></ext_integer>
PATNAME? WMA WMB LONG CO MB, n	V	PATNAME? WMA WMB LONG COMB, <ext_integer></ext_integer>	V	Queries the name of the loaded waveform file	<pre>:MEMory[1] 2:WAVefo rm:WMA:NAME? <ext_integer> :MEMory[1] 2:WAVefo rm:WMB:NAME? <ext_integer> :MEMory[1] 2:WAVefo rm:NAME? <ext_integer></ext_integer></ext_integer></ext_integer></pre>
LOADEDFILENUM? WMA WMB LONG CO MB	\checkmark	LOADEDFILENUM? WMA WMB LONG COMB	\checkmark	Obtains the number of loaded files.	:MEMory[1] 2:WAVefo rm:WMA:COUNt? :MEMory[1] 2:WAVefo rm:WMB:COUNt? :MEMory[1] 2:WAVefo rm:COUNt?

Appendix F Native Device Message Details

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
PATNUM? WMA WMB LONG CO MB	\checkmark	PATNUM? WMA WMB LONG COMB	N	Obtains the number of loaded files	:MEMory[1] 2:WAVefo rm:WMA:COUNt? :MEMory[1] 2:WAVefo rm:WMB:COUNt? :MEMory[1] 2:WAVefo rm:COUNt?
CFTOHDD s1,s2	\checkmark	CFTOHDD <string1> CFROOT,<strin g2>[,<device1>[,<device 2>]]</device </device1></strin </string1>	N/A	Copies the waveform file from the external media to the hard disc string1: Name of the copy source package string2: Name of the copy source file device1: Device with the youngest drive letter connected via the one other than opt011=Off: Device with the youngest drive letter connected via the one other than C. opt011=On: Device with the youngest drive letter connected via the one other than C and D device2: C, when the copy destination device is omitted.	:MMEMory:COPY:WAVef orm <device1>[,<string> ROOT,<string1>,<st ring2>[,<device2>]]</device2></st </string1></string></device1>

 Table F.5.3-1
 Compatible List of Load Pattern Device Messages (Cont'd)

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
DELFILEWM WMA WMB LONG CO MB,s1,s2	V	DELFILEWM WMA WMB LONG COMB,s1,s2	V	Deletes the waveform files on the selected memory	<pre>:MEMory[1] 2:DELete :WAVeform[:NAME] <string1>,<string2> :MEMory[1] 2:DELete :WAVeform:WMA[:NAME] <string1>,<string2> :MEMory[1] 2:DELete :WAVeform:WMB[:NAME] <string1>,<string2></string2></string1></string2></string1></string2></string1></pre>
DELFILEWM ALL	\checkmark	DELFILEWM ALL		Deletes the waveform files on all memories	:MEMory[1] 2:DELete :WAVeform:ALL
DELPATWM WMA WMB LONG CO MB,s1,s2	V	DELPATWM WMA WMB LONG COMB,s1,s2	V	Deletes the waveform files on the selected memory	:MEMory[1] 2:DELete :WAVeform[:NAME] <string1>,<string2> :MEMory[1] 2:DELete :WAVeform:WMA[:NAME] <string1>,<string2> :MEMory[1] 2:DELete :WAVeform:WMB[:NAME] <string1>,<string2></string2></string1></string2></string1></string2></string1>
DELPATWM ALL	\checkmark	DELPATWM ALL	\checkmark	Deletes the waveform files on all memories	:MEMory[1] 2:DELete :WAVeform:ALL

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
WMSPC? WMA WMB	V	WMSPC? WMA WMB	V	Obtains the free space of the memory	:MEMory[1] 2:WAVefo rm:WMA:FREE? :MEMory[1] 2:WAVefo rm:WMB:FREE?
WMOPTIMIZE WMA WMB	V	WMOPTIMIZE WMA WMB	\checkmark	Optimizes the memory Command F is accepted but does not affect the MG3710A/10E/40A	_
WMOPTCHK WMA WMB	V	WMOPTCHK WMA WMB	\checkmark	Checks the optimization of the memory The command is accepted but does not affect the MG3710A/10E/40A	_
WMOPTCHK? WMA WMB	\checkmark	WMOPTCHK? WMA WMB	V	Checks the optimization of the memory The command is accepted but does not affect the MG3710A/10E/40A Response: Always NO_NEED_OPTIMIZE	_
WMOPTCANCEL	V	WMOPTCANCEL	\checkmark	Stops the optimization of the memory The command is accepted but does not affect the MG3710A/10E/40A	_
HDDSPC?	\checkmark	HDDSPC? [<device>]</device>	N/A	Obtains the space information of the hard disk C, when <device> is omitted</device>	:MMEMory:FREE[:ALL] ? [<device>]</device>
COMBPAT? s1,s2,WMA WMB	\checkmark	COMBPAT? <string1>,<string2>,WMA WMB[,<device>]</device></string2></string1>	N/A	Queries the pattern file name existing on HDD. C, when <device> is omitted Returns "NONE","NONE" when querying non existing files and sequence files</device>	_

 Table F.5.3-1
 Compatible List of Load Pattern Device Messages (Cont'd)

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
COMBTOTALSIZE? s1,s2	\checkmark	COMBTOTALSIZE? <string1>,<string2>,[<de vice>]</de </string2></string1>	N/A	Queries the total size of the pattern files used by the combination file C, when <device> is omitted Returns in Byte the total size of wvd of each WaveMemory In the case of a Sequence file, returns the total of the wvd files of the element as the size of WaveMemoryA (excluding the overlapped ones) Returns wvd of the AddMode as the size of WaveMemoryB</device>	
SEQELMNUM? s1,s2	\checkmark	<pre>SEQELMNUM? <string1>,<string2>[,<de vice="">]</de></string2></string1></pre>	N/A	Queries the number of elements that belong to the combination file for the sequence mode existing on HDD C, when <device> is omitted</device>	_
SEQELMNAME? s1,s2,n	\checkmark	<pre>SEQELMNAME? <string1>,<string2>,<ext _integer="">[,<device>]</device></ext></string2></string1></pre>	N/A	Queries the number of elements that belong to the combination file for the sequence mode existing on HDD C, when <device> is omitted</device>	_
SEQCURRENTELM?	\checkmark	SEQCURRENTELM?	\checkmark	Obtains the element number of the pattern regenerated in the sequence	_
FILEVER? s1,s2	\checkmark	<pre>FILEVER? <string1>,<string2>[,<de vice="">1</de></string2></string1></pre>	N/A	Queries the version number of the pattern file existing on HDD C, when <device> is omitted</device>	-

vice>]

F.5.4 Ext I/O Setup

Given below is the compatible list of the Ext I/O Setup device messages:

Table F 5 4-1	Compatible List of Ext I/O Setup Device Messages
	Compatible List of LAT NO Detup Device Messages

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN B_IOSETUP		SCREEN B_IOSETUP	N/A	Moves to the Ext I/O Setup screen This command is accepted but the screen is not moved	_
SFTRG ON OFF		SFTRG ON OFF	\checkmark	Start/Frame Trigger	<pre>[:SOURce[1] 2]:RADi o:ARB:TRIGger[:STAT e] <boolean></boolean></pre>
SFTRG?		SFTRG?	\checkmark	Start/Frame Trigger	<pre>[:SOURce[1] 2]:RADi o:ARB:TRIGger[:STAT e]?</pre>
SFTRGMODE START FRAME	\checkmark	SFTRGMODE START FRAME	\checkmark	Start/Frame Trigger Mode	[:SOURce[1] 2]:RADi o:ARB:TRIGger:TYPE STARt FRAMe
SFTRGMODE?	\checkmark	SFTRGMODE?	\checkmark	Start/Frame Trigger Mode	[:SOURce[1] 2]:RADi o:ARB:TRIGger:TYPE?
STGS INT EXTSTA EXT E XTFRM		STGS INT EXTSTA EXT EXTFRM	\checkmark	Start/Frame Trigger Source	-
STGS?	\checkmark	STGS?	\checkmark	Start/Frame Trigger Source Returns EXTSTA when Start Trigger is set	_

H	
4	
4	

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
STDLY n	\checkmark	STDLY <ext_numeric></ext_numeric>	\checkmark	Start/Frame Trigger Delay Setting unit: In sample point, Resolution: 0.01 The setting of STDLY is as same as that of STDLYSYM (a/OverSampling)	_
STDLY?	\checkmark	STDLY?	\checkmark	Start/Frame Trigger Delay	_
STDLYSYM n	\checkmark	STDLYSYM <ext_numeric></ext_numeric>	\checkmark	Start/Frame Trigger Delay (to be specified in conversion unit) Resolution: 0.01	[:SOURce]:ARB:TRIGg er:DELay <ext_numeric></ext_numeric>
STDLYSYM?	\checkmark	STDLYSYM?	\checkmark	Start/Frame Trigger Delay (to be specified in conversion unit)	<pre>[:SOURce[1] 2]:RADi o:ARB:TRIGger:DELay ?</pre>
EIST RISE FALL	\checkmark	EIST RISE FALL	\checkmark	Start/Frame Trigger Edge	[:SOURce[1] 2]:RADi o:ARB:TRIGger:SLOPe POSitive NEGative
EIST?	\checkmark	EIST?	\checkmark	Start/Frame Trigger Edge	[:SOURce[1] 2]:RADi o:ARB:TRIGger:SLOPe ?
REFCLKSRC INT EXT	\checkmark	REFCLKSRC INT EXT EXTS SYNC	\checkmark	BB Reference Clock Source INT :Internal, EXT:External EXTS :External(BB Ref Sync) SYNC :Sync with 1st SG	[:SOURce[1] 2]:RADi o:ARB:CLOCk:REFeren ce[:SOURce] INTernal EXTernal E XTSync
REFCLKSRC?	\checkmark	REFCLKSRC?	\checkmark	BB Reference Clock Source	[:SOURce[1] 2]:RADi o:ARB:CLOCk:REFeren ce[:SOURce]?

Appendix F Native Device Message Details

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
					[:SOURce[1] 2]:RADi
PATTRG ON OFF	\checkmark	PATTRG ON OFF	\checkmark	Pattern Trigger On/Off	<pre>o:ARB:SEQuence:TRIG ger[:STATe] <boolean></boolean></pre>
					<pre> cboolean> [:SOURce[1] 2]:RADi</pre>
PATTRG?	\checkmark	PATTRG?	V	Pattern Trigger On/Off	<pre>[:SOURCe[1][2]:RAD1 o:ARB:SEQuence:TRIG ger[:STATe]?</pre>
PATTRGEDGE RISE FALL		PATTRGEDGE RISE FALL	\checkmark	Pattern Trigger Edge Valid only for Pattern Trigger 1	[:SOURce[1] 2]:RADi o:ARB:SEQuence:TRIG ger1:SLOPe POSitive NEGative
PATTRGEDGE?	\checkmark	PATTRGEDGE?	\checkmark	Pattern Trigger Edge Valid only for Pattern Trigger 1	[:SOURce[1] 2]:RADi o:ARB:SEQuence:TRIG ger1:SLOPe?
REFCLKVAL SIXTEENTH EIGHTH QUARTER HALF 1 2 4 8 16	\checkmark	[:SOURCe[1]]:REFCLKVA L SIXTEENTH EIGHTH QUAR TER HALF X1 X2 X4 X8 X16	N/A	BB Reference Clock	[:SOURce[1]]:RADio: ARB:CLOCk:REFerence :DIVision SIXTeenth EIGHth QU ARter HALF X1 X2 X4 X8 X16
REFCLKVAL?	\checkmark	[:SOURce[1]]:REFCLKVA L?	N/A	BB Reference Clock	[:SOURce[1]]:RADio: ARB:CLOCk:REFerence :DIVision?
MARKERPOL n,a		MARKERPOL <ext_integer>, POS NEG</ext_integer>	\checkmark	Marker Polarity Valid only for WMA	[:SOURce[1] 2]:RADi o:ARB:WMA:MARKer1 2 3:POLarity POSitive NEGative

 Table F.5.4-1
 Compatible List of Ext I/O Setup Device Messages (Cont'd)

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
MARKERPOL? n	V	MARKERPOL? <ext_integer></ext_integer>	\checkmark	Marker Polarity Valid only for WMA	<pre>[:SOURce[1] 2]:RADi o:ARB:WMA:MARKer1 2 3:POLarity?</pre>
PMO INT EXT OFF	N	PMO INT EXT OFF	V	Pulse Modulation Source When setting INT: PulseModulatino=Off, RFGate=On When setting EXT: PulseModulation=On, PulseSource=Ext Pulse, RFGate=Off When setting OFF: PulseModulatino=Off, RFGate=On	_
PMO?	V	PMO?	V	Pulse Modulation Source When setting INT: When RFGate=On EXT: When PulseModulation=On, PulseSource=Ext Pulse, and RFGate=Off OFF: Other than the above:	_

Appendix F Native Device Message Details

F.5.5 I/Q tuning

Given below is the compatible list of the I/Q Tuning device messages:

	Competible List of I/O Turing Device Messages
Table F.5.5-1	Compatible List of I/Q Tuning Device Messages

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN BB_IQTUNING	\checkmark	SCREEN BB_IQTUNING	N/A	Moves to the I/Q Tuning screen This command is accepted but the screen is not moved	_
IOLTR p	\checkmark	IOLTR <percent></percent>	N/A	I Output Level Trimming	[:SOURce[1]]:DM:IQA Djustment:EXTernal: ITRimming <percent></percent>
IOLTR?	\checkmark	IOLTR?	N/A	I Output Level Trimming	[:SOURce[1]]:DM:IQA Djustment:EXTernal: ITRimming?
QOLTR p	\checkmark	QOLTR <percent></percent>	N/A	Q Output Level Trimming	[:SOURce[1]]:DM:IQA Djustment:EXTernal: QTRimming <percent></percent>
QOLTR?		QOLTR?	N/A	Q Output Level Trimming	[:SOURce[1]]:DM:IQA Djustment:EXTernal: QTRimming?

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
ICOMOS l	√	ICOMOS <voltage></voltage>	N/A	I Common Offset While I-phase and Q-phase can be set and read separately on MG3700A, setting and reading either I-phase or Q-phase on the MG3710A/10E/40A refers to IQ Common Offset. (For example, if Q-phase is set after I-phase is set, the value of IQ Common Offset is the setting for Q-phase.) I Common Offset	[:source :IQADjustm ent:EXTernal:COFFse t <voltage></voltage>
ICOMOS?	\checkmark	ICOMOS?	N/A	While I-phase and Q-phase can be set and read separately on MG3700A, setting and reading either I-phase or Q-phase on the MG3710A/10E/40A refers to IQ Common Offset. (For example, if Q-phase is set after I-phase is set, the value of IQ Common Offset is the setting for Q-phase.)	[:SOURce[1]]:DM:IQA Djustment:EXTernal: COFFset?
QCOMOS 1	1	QCOMOS <voltage></voltage>	N/A	Q Common Offset While I-phase and Q-phase can be set and read separately on MG3700A, setting and reading either I-phase or Q-phase on the MG3710A/10E/40A refers to IQ Common Offset. (For example, if Q-phase is set after I-phase is set, the value of IQ Common Offset is the setting for Q-phase.)	[:source :IQADjustm ent:EXTernal:COFFse t <voltage></voltage>

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
QCOMOS?	\checkmark	QCOMOS?	N/A	Q Common Offset While I-phase and Q-phase can be set and read separately on MG3700A, setting and reading either I-phase or Q-phase on the MG3710A/10E/40A refers to IQ, Common, Offset. (For example, if Q-phase is set after I-phase is set, the value of IQ, Common, Offset is the setting for Q-phase.)	[:SOURce[1]]:DM:IQA Djustment:EXTernal: COFFset?
IDIFFOS l	\checkmark	IDIFFOS <voltage></voltage>	N/A	I Differential Offset	[:SOURce[1]]:DM:IQA Djustment:EXTernal: DIOFfset <voltage></voltage>
IDIFFOS?	\checkmark	IDIFFOS?	N/A	I Differential Offset	[:SOURce[1]]:DM:IQA Djustment:EXTernal: DIOFfset?
QDIFFOS l	\checkmark	QDIFFOS <voltage></voltage>	N/A	Q Differential Offset	[:SOURce[1]]:DM:IQA Djustment:EXTernal: DQOFfset <voltage></voltage>
QDIFFOS?	\checkmark	QDIFFOS?	N/A	Q Differential Offset	[:SOURce[1]]:DM:IQA Djustment:EXTernal: DQOFfset?

Table F.5.5-1 Compatible List of I/Q Tuning Device Messages (Cont'd)

	Table F.5.6-1 Compatible List of Edit HDD Device Messages						
MG3700A Commands	Compat ibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)		
SCREEN BB_EDITHDD	V	SCREEN BB_EDITHDD	N/A	Moves to the Edit HDD screen This command is accepted but the screen is not moved	_		
DELFILEHDD s1,s2		<pre>DELFILEHDD <string1>,<srting2>[,< device>]</srting2></string1></pre>	N/A	Deletes waveform files on the hard disk C, when <device> is omitted wvc is given preference where both wvc and wvi exist.</device>	<pre>:MMEMory:DELete:WAV eform[:NAME] <string1>,<string2> ,[<device>] :MMEMory:DELete:WAV eform:SINGle[:NAME] <string1>,<string2> ,[<device>]</device></string2></string1></device></string2></string1></pre>		
DELPATHDD s1,s2	V	<pre>DELPATHDD <string1>,<srting2>[,< device>]</srting2></string1></pre>	N/A	Deletes waveform files on the hard disk. C, when <device> is omitted. wvc is given preference where both wvc and wvi exist.</device>	<pre>:MMEMory:DELete:WAV eform[:NAME] <string1>,<string2> ,[<device>] :MMEMory:DELete:WAV eform:SINGle[:NAME] <string1>,<string2> ,[<device>]</device></string2></string1></device></string2></string1></pre>		

Given below is the compatible list of Edit HDD device messages.

Appendix F Native Device Message Details

F.5.7 Sequence Progress

Given below is the compatible list of Sequence Progress device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN BB_PROGRESS	\checkmark	SCREEN BB_PROGRESS	N/A	Moves to the Sequence Progress screen This command is accepted but the screen is not moved.	_
SEQNEXTPAT	\checkmark	SEQNEXTPAT	\checkmark	Sequence Next Pattern	[:SOURce[1] 2]:RADi o:ARB:SEQuence:NEXT
SEQRESTART	\checkmark	SEQRESTART	\checkmark	Sequence Restart	INITiate[1] 2:ARB:S EQuence[:IMMediate]
SEQPLAYMODE AUTO MANUAL	\checkmark	SEQPLAYMODE AUTO MANUAL	\checkmark	Sequence Play Mode	[:SOURce[1] 2]:RADi o:ARB:SEQuence:MODE AUTO MANual
SEQPLAYMODE?		SEQPLAYMODE?	\checkmark	Sequence Play Mode	[:SOURce[1] 2]:RADi o:ARB:SEQuence:MODE ?
SEQSWPOINT PAT_END FRAME_END	\checkmark	SEQSWPOINT PAT_END FRAME_END	\checkmark	Sequence Switching Point	[:SOURce[1] 2]:RADi o:ARB:SEQuence:TRIG ger:SPOint PATTen FRAMe
SEQSWPOINT?	\checkmark	PSEQSWPOINT?	V	Sequence Switching Point	[:SOURce[1] 2]:RADi o:ARB:SEQuence:TRIG ger:SPOint?

F.5 Modulation Functions



F.6 Utility Function

F.6.1 Common to utility functions

Given below is the compatible list of device messages common to utility functions.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_TOP	\checkmark	SCREEN UTIL_TOP	N/A	Moves to the utility function top screen This command is accepted but the screen is not moved.	_

F.6.2 Save/Recall

Given below is the comp able list of Save/Recall device messages.

Table F 6 2-1	Compatible List of Save/Recall Device Messages
	Compatible List of Cave/Accall Device Messages

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_PARAMSR	\checkmark	SCREEN UTIL_PARAMSR	N/A	Moves to the Parameter Save/Recall screen This command is accepted but the screen is not moved.	-
PRMSAV s	\checkmark	PRMSAV <string>[,<device>]</device></string>	N/A	Parameter Save The device specified by PRMMEDIA when <device> is omitted.</device>	:MMEMory:STORe:STAT e [<filename>[,<devic e>]]</devic </filename>
PRMREC s	\checkmark	<pre>PRMREC <string>[,<device>]</device></string></pre>	N/A	Parameter Recall The device specified by PRMMEDIA when <device> is omitted.</device>	:MMEMory:LOAD:STATe <filename>[,<device >]</device </filename>
PRMDEL s	\checkmark	PRMDEL <string>[,<device>]</device></string>	N/A	Parameter File Delete The device specified by PRMMEDIA when <device> is omitted.</device>	:MMEMory:DELete:STA Te <filename>,<device></device></filename>
PRMLST?	\checkmark	PRMLST? [<device>]</device>	N/A	Parameter File List The device specified by PRMMEDIA when <device> is omitted.</device>	:MMEMory:CATalog:ST ATe? <device></device>

F.6 Utility Function

Table F.6.2-1 Compatible List of Save/Recall Device Messages (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
PRMMEDIA HDD CF	\checkmark	PRMMEDIA HDD CF	N/A	Selects media for Save/Recall. C drive when HDD is selected. Devices other than HDD whose drive letter is the youngest, when CF is selected Default: HDD	_	
PRMMEDIA?	\checkmark	PRMMEDIA?	N/A	Selects media for Save/Recall	_	

F.6.3 BER Measurement

Given below is the compatible list of the BER measurement device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_BERT	\checkmark	SCREEN UTIL_BERT	N/A	Moves to the BER measurement screen This command is accepted but the screen is not moved.	_
SCREEN UTIL_BER_IO	\checkmark	SCREEN UTIL_BER_IO	N/A	Moves to the BER measurement Interface Setup screen This command is accepted but the screen is not moved.	_
SCREEN UTIL_BER_RESYNC	\checkmark	SCREEN UTIL_BER_RESYNC	N/A	Moves to the BER measurement Resync Condition Setup screen This command is accepted but the screen is not moved.	_
BERSTART	\checkmark	BERSTART	N/A	Executes the BER measurement	:INITiate:BERT[:IMM ediate]
BERSTOP	\checkmark	BERSTOP	N/A	Stops the BER measurement	:ABORt:BERT
BERCOUNTCLR	\checkmark	BERCOUNTCLR	N/A	Clears the BER measurement bit	[:SENSe]:BERT[:BASe band]:COUNt:CLEar
BERDATA POS NEG		BERDATA POS NEG	N/A	Sets the Data polarity	:INPut:BERT[:BASeba nd]:DATA:POLarity POSitive NEGative

F.6

Table F.6.3-1 Compatible List of BER Measurement Device Messages (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
BERDATA?	\checkmark	BERDATA?	N/A	Sets the Data polarity.	:INPut:BERT[:BASeba nd]:DATA:POLarity?	
BERCLK RISE FALL	٨	BERCLK RISE FALL	N/A	Sets the Clock polarity	:INPut:BERT[:BASeba nd]:CLOCk:POLarity POSitive NEGative	
BERCLK?		BERCLK?	N/A	Sets the Clock polarity.	:INPut:BERT[:BASeba nd]:CLOCk:POLarity?	
BERENBL POS NEG DISABLE	1	BERENBL POS NEG DISABLE	N/A	Sets the Enable polarity	:INPut:BERT[:BASeba nd]:CGATe:POLarity POSitive NEGative D ISable	
BERENBL?	\checkmark	BERENBL?	N/A	Sets the Enable polarity	:INPut:BERT[:BASeba nd]:CGATe:POLarity?	
BERDATATHLD 1	N/A	-	-	Data signal threshold level.	_	
BERDATATHLD?	N/A	-	-	Data signal threshold level	-	
BERCLKTHLD 1	N/A	-	-	Clock signal threshold level	-	
BERCLKTHLD?	N/A	-	-	Clock signal threshold level	_	
BERENBLTHLD 1	N/A	_	-	Enable level threshold level	_	

Appendix F Native Device Message Details

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BERENBLTHLD?	N/A	_	-	Enable level threshold level	_
BERDATADELAY n	N/A	_	-	Sets Data Delay	_
BERDATADELAY?	N/A	_	-	Sets Data Delay	_
BERENBLDELAY n	N/A	_	-	Sets Enable Delay	_
BERENBLDELAY?	N/A	-	-	Sets Enable Delay	_
BERINZ HIZ 50	N/A	-	-	Input impedance	_
BERINZ?	N/A	-	-	Input impedance	-
BERMEDIA HDD CF	\checkmark	BERMEDIA HDD CF	N/A	Selects media for the BER measurement log. C drive when HDD is selected Devices other than HDD whose drive letter is the youngest, when CF is selected. Default: HDD	_
BERMEDIA?	\checkmark	BERMEDIA?	N/A	Selects media for the BER measurement log	_
BERAUTORESYNC ON OFF	V	BERAUTORESYNC ON OFF	N/A	Sets the automatic resynchronization	[:SENSe]:BERT[:BASe band]:RSYNc[:STATe] <boolean></boolean>
BERAUTORESYNC?	V	BERAUTORESYNC?	N/A	Sets the automatic resynchronization	[:SENSe]:BERT[:BASe band]:RSYNc[:STATe] ?
BERMODE SINGLE CONTINUOUS ENDLESS	V	BERMODE SINGLE CONTINUOUS END LESS	N/A	Sets the measurement mode	[:SENSe]:BERT[:BASe band]:MODE SINGle CONTinuous E NDLess

H	
5	
00	

Table F.6.3-1 Compatible List of BER Measurement Device Messages (Cont'd)					
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BERMODE?	\checkmark	BERMODE?	N/A	Sets the measurement mode	[:SENSe]:BERT[:BASe band]:MODE?
BERCOUNTMODE TIME DATABIT ERRO RBIT	V	BERCOUNTMODE DATABIT ERRORBIT	N/A	Measurement end condition TIME specification is not supported	[:SENSe]:BERT[:BASe band]:STOP:CRITeria [:SELect] EBIT NONE
BERCOUNTMODE?	\checkmark	BERCOUNTMODE?	N/A	Measurement end condition	[:SENSe]:BERT[:BASe band]:STOP:CRITeria [:SELect]?
BERTIME n	N/A	_	-	Measurement time	_
BERTIME?	N/A	-	-	Measurement time	_
BERBIT b	\checkmark	BERBIT <ext_integer></ext_integer>	N/A	Measurement bit count	[:SENSe]:BERT[:BASe band]:TBITs <ext integer=""></ext>
BERBIT?		BERBIT?	N/A	Measurement bit count	[:SENSe]:BERT[:BASe band]:TBITs?
BERERRORBIT b	V	BERERRORBIT <ext_integer></ext_integer>	N/A	Measurement error bit count	[:SENSe]:BERT[:BASe band]:STOP:CRITeria :EBIT <ext integer=""></ext>
BERERRORBIT?	V	BERERRORBIT?	N/A	Measurement error bit count	[:SENSe]:BERT[:BASe band]:STOP:CRITeria :EBIT?

.... _ . . . 84. ... (ام 14 _ . . _ _ --- -

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BERLOG s	\checkmark	BERLOG <string>[,<device>]</device></string>	N/A	Log output Device specified by BERMEDIA when <device> is omitted</device>	:MMEMory:STORe:BERT :LOG <string>[,<device>]</device></string>
BERLOGCLEAR	\checkmark	BERLOGCLEAR	N/A	Clears logs	[:SENSe]:BERT[:BASe band]:LOG:CLEar
BERLOGFILEDEL s	\checkmark	BERLOGFILEDEL <string>[,<device>]</device></string>	N/A	Deletes Log files Device specified by BERMEDIA when <device> is omitted</device>	:MMEMory:DELete:BER T:LOG <string>[,<device>]</device></string>
BERTYPE PN9 PN11 PN15 PN2 0 PN23 ALL0 ALL1 ALT PN9FIX PN11FI X PN15FIX PN20FIX PN23FIX USERPATT ERN	V	BERTYPE PN9 PN11 PN15 PN20 PN 23 ALL0 ALL1 ALT PN9F IX PN11FIX PN15FIX PN 20FIX PN23FIX USERPAT TERN	N/A	PN Type	[:SENSe]:BERT[:BASe band]:PRBS[:DATA] PN9 PN11 PN15 PN20 PN23 ALL0 ALL1 ALT FPN9 FPN11 FPN15 FP N20 FPN23 USER
BERTYPE?	\checkmark	BERTYPE?	N/A	PN Type	[:SENSe]:BERT[:BASe band]:PRBS[:DATA]?
RCVBIT?	\checkmark	RCVBIT?	n/a	Receive Bit	FETCh:BERT:DATA:COU
BITERR?	\checkmark	BITERR?	N/A	Bit Error Count	<pre>FETCh:BERT:ERROr:CC UNt?</pre>

Table F.6.3-1 Compatible List of BER Measurement Device Messages (Cont'd)

F.6

H	
6	
Ö	

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BER? EP ER	\checkmark	BER? EP ER	N/A	Bit Error Rate	FETCh:BERT:ERRor:RA
BERSYNCLOSS?	\checkmark	BERSYNCLOSS?	N/A	Number of occurrences of Sync Loss.	[:SENSe]:BERT[:BASe band]:SYNLoss:COUNt ?
BERSYNCLOSSTHLD n, a	\checkmark	BERSYNCLOSSTHLD <ext_integer>,500 500 0 50000</ext_integer>	N/A	Threshold for detecting Sync Loss.	<pre>[:SENSe]:BERT[:BASe band]:RSYNc:THResho ld <ext_integer>,500 5 000 50000</ext_integer></pre>
BERSYNCLOSSTHLD?		BERSYNCLOSSTHLD?	N/A	Threshold for detecting Sync Loss	[:SENSe]:BERT[:BASe band]:RSYNc:THResho ld?
BERSYNCLOSSACT COUNT_CLEAR COUNT _KEEP	\checkmark	BERSYNCLOSSACT COUNT_CLEAR COUNT_KEE P	N/A	Count operation when Sync Loss is detected	[:SENSe]:BERT[:BASe band]:RSYNc:COUNt:A CTion CLEar KEEP
BERSYNCLOSSACT?	\checkmark	BERSYNCLOSSACT?	N/A	Count operation when Sync Loss is detected	[:SENSe]:BERT[:BASe band]:RSYNc:COUNt:A CTion?
BERSTATUS?	\checkmark	BERSTATUS?	N/A	Obtain the measurement status	_
BERERROR?	\checkmark	BERERROR?	N/A	Obtain the measurement error status	[:SENSe]:BERT[:BASe band]:ERRor?
BERSTOPSTATUS?	\checkmark	BERSTOPSTATUS?	N/A	Obtain the measurement stop status	_
BERRESULT? EP ER EP_WSYNCLOS S ER WSYNCLOSS		BERRESULT? EP ER EP_WSYNCLOSS ER WSYNCLOSS	N/A	Obtain the result and status of measurement	-

Appendix F Native Device Message Details

F.6.4 BER Measurement (Data Type Detail Setup)

Given below is the compatible list of BER measurement (Data Type Detail Setup) device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_BER_DETAIL	\checkmark	SCREEN UTIL_BER_DETAIL	N/A	Moves to the BER measurement Data Type Detail screen This command is accepted but the screen is not moved.	_
BERPNINITIAL n	\checkmark	BERPNINITIAL <binary></binary>	N/A	The default value of the PN pattern to be used for PN Fix. Attaches #B at the head of the argument.	[:SENSe]:BERT[:BASe band]:PRBS:PNFix:IN ITial <binary></binary>
BERPNINITIAL?	\checkmark	BERPNINITIAL?	N/A	The default value of the PN pattern to be used for PN Fix When the language mode is MS269xA, #B is not attached to the return value	[:SENSe]:BERT[:BASe band]:PRBS:PNFix:IN ITial?
BERPNFIXLENG n	\checkmark	BERPNFIXLENG <ext_integer></ext_integer>	N/A	The length of one cycle of the pattern to be used for PN Fix	[:SENSe]:BERT[:BASe band]:PRBS:PNFix:LE NGth <ext_integer></ext_integer>
BERPNFIXLENG?	\checkmark	BERPNFIXLENG?	N/A	The length of one cycle of the pattern to be used for PN Fix	[:SENSe]:BERT[:BASe band]:PRBS:PNFix:LE NGth?
BERSYNCSTARTPOS n	\checkmark	BERSYNCSTARTPOS <ext_integer></ext_integer>	N/A	Specifies the position of the top bit of the portion in the user defined pattern to be used for synchronization judgment	[:SENSe]:BERT[:BASe band]:PRBS:USER:SYN C:STARt <ext_integer></ext_integer>

Table F.6.4-1 Compatible List of BER Measurement (Data Type Detail Setup) Device Messages

F.6 Utility Function

Та	Table F.6.4-1 Compatible List of BER Measurement (Data Type Detail Setup) Device Messages (Cont'd)				
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BERSYNCSTARTPOS?	N	BERSYNCSTARTPOS?	N/A	Specifies the position of the top bit of the portion in the user pattern to be used for synchronization judgment	[:SENSe]:BERT[:BASe band]:PRBS:USER:SYN C:STARt?
BERSYNCLENG n	\checkmark	BERSYNCLENG <ext_integer></ext_integer>	N/A	Length of the portion in the user defined pattern to be used for synchronization judgment	[:SENSe]:BERT[:BASe band]:PRBS:USER:SYN C:LENGth <ext_integer></ext_integer>
BERSYNCLENG?	V	BERSYNCLENG?	N/A	Length of the portion in the user defined pattern to be used for synchronization judgment	[:SENSe]:BERT[:BASe band]:PRBS:USER:SYN C:LENGth?
BERLOADMEDIA a	\checkmark	BERLOADMEDIA HDD CF	N/A	Loading source media of the user defined pattern C drive when HDD is selected Devices other than HDD whose drive letter is the youngest, when CF is selected Default: HDD	_
BERLOADMEDIA?		BERLOADMEDIA?	N/A	User defined pattern loading source media	-
BERUSERPATLST?	V	BERUSERPATLST? [<device>]</device>	N/A	List of the user defined pattern files Device specified by BERLOADMEDIA when <device> is omitted</device>	:MMEMory:LIST:BERT: PATTern? [<device>]</device>
BERLOADUSERPAT s		BERLOADUSERPAT <string>[,<device>]</device></string>	N/A	Loads the user defined patterns Device specified by BERLOADMEDIA when <device> is omitted</device>	:MMEMory:LOAD:BERT: PATTern <string>[,<device>]</device></string>

Ia	Table F.6.4-1 Compatible List of BER Measurement (Data Type Detail Setup) Device Messages (Cont'd)				
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BERUSERPAT?	\checkmark	BERUSERPAT?	N/A	Current user defined pattern file	[:SENSe]:BERT[:BASe band]:PRBS:USER:PAT Tern?
BERUSERPATLENG?	\checkmark	BERUSERPATLENG?	N/A	Current user defined pattern bit length	[:SENSe]:BERT[:BASe band]:PRBS:USER:LEN Gth?

Table F.6.4-1 Compatible List of BER Measurement (Data Type Detail Setup) Device Messages (Cont'd)

	Give	n below is the compatible lis	st of Ala	rm Monitor device messages.	
MG3700A Commands	Com- patibility	Table F.6.5-1 Compati MG3710A/10E/40A Commands (MG3700 mode)	ble List SG 1/2	of Alarm Monitor Device Messages Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_ALARMMON	\checkmark	SCREEN UTIL_ALARMMON	N/A	Moves to the Alarm Monitor screen This command is accepted but the screen is not moved.	_
ALMMONITOR?	V	ALMMONITOR?	V	Alarm Monitor Response = bit0 + bit1 + bit2 + bit3 + bit + bit5 + bit6 + bit7 bit7 : Unused (fixed to 0) bit6 : Unused (fixed to 0) bit5 : Unused (fixed to 0) bit4 : RppStatus On bit3 : Unlock BB Int Clock bit2 : ALC Alarm bit1 : Unused (fixed to 0) bit0 : Int.Unlock	_
ALMLOG s	\checkmark	ALMLOG <string>[,<device>]</device></string>	\checkmark	Alarm History output Device specified by ALMMEDIA when <device> is omitted</device>	:MMEMory:STORe:ALAR m:LOG <string>[,<device>]</device></string>

Appendix F Native Device Message Details

F.6.5 Alarm Monitor

Table F.6.5-1 Compatible List of Alarm Monitor Device Messages (Cont'd)					
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
ALMMEDIA HDD CF	V	ALMMEDIA HDD CF	V	Selects media for Alarm History output C drive when HDD is selected Devices other than HDD whose drive letter is the youngest, when CF is selected Default: HDD	_
ALMMEDIA?	\checkmark	ALMMEDIA?	\checkmark	Selects media for Alarm History output	_

F.6 Utility Function

F.6.6 Interface Setup

Given below is the compatible list of the Interface Setup device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_IFSET	\checkmark	SCREEN UTIL_IFSET	N/A	Moves to the Interface Setup Interface Setup screen This command is accepted but the screen is not moved.	_
TRM 0 1 LF CRLF	\checkmark	TRM 0 1 LF CRLF EOI	N/A	GPIB Terminator	:SYSTem:COMMunicate :GPIB:TERMinator LF CRLF EOI
TRM?	\checkmark	TRM?	N/A	GPIB Terminator Response: LF, CRLF, EOI	:SYSTem:COMMunicate :GPIB:TERMinator?

Appendix F Native Device Message Details

F.6.7 Network Setup

Given below is the compatible list of the Network Setup device messages:

Table F.6.7-1	Compatible List of Network Setup Device Messages
	Compatible Liet of Hothork Cotap Berlice meedagee

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_NETSET	\checkmark	SCREEN UTIL_NETSET	N/A	Moves to the Network Setup Interface Setup screen This command is accepted but the screen is not moved.	_
HOSTNAME s	N/A	_	-	Host Name To be set on Windows	_
HOSTNAME?	N/A	-	-	Host Name To be set on Windows	_
DOMAINNAME s	N/A	_	-	Host Name To be set on Windows	_
DOMAINNAME?	N/A	-	-	Host Name To be set on Windows	_
DHCP ON OFF	N/A	_	-	DHCP To be set on Windows	_
DHCP?	N/A	_	-	DHCP To be set on Windows	_
IPAD n1,n2,n3,n4	N/A	-	-	IP Address To be set on Windows	_
IPAD?	N/A	-	-	IP Address To be set on Windows	_
SUBNET n1,n2,n3,n4	N/A	-	-	Subnet mask To be set on Windows	_

F.6 Utility Function

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)				
SUBNET?	N/A	_	-	Subnet mask	_				
				To be set on Windows					
DNSAUTO ON OFF	N/A	-	-	DNS	_				
				To be set on Windows					
DNSAUTO?	N/A	_	-	DNS	_				
511011010.				To be set on Windows					
DNS1AD n1,n2,n3,n4	N/A	_	-	DNS Primary Address	_				
DNSIAD NI,NZ,N3,N4	10/ 11		_	To be set on Windows	_				
	NT / 7	N/A	NT / 7	NT / 7	NT / 7			DNS Primary Address	
DNS1AD?	IN/ A	N/A _	-	To be set on Windows	_				
	NT / 7	N/A _	-	DNS Secondary Address					
DNS2AD n1,n2,n3,n4 N/A	N/A			To be set on Windows	-				
	27 / 7			DNS Secondary Address					
DNS2AD?	N/A	-	-	To be set on Windows	-				
GATEWAY	1 -			Default Gateway					
n1,n2,n3,n4	N/A	-	-	To be set on Windows	-				
, , , ,				Default Gateway					
GATEWAY?	N/A	-	-	To be set on Windows	-				
				IQproducer User ID					
IQPROID s	N/A	-	-	To be set on Windows	-				
				IQproducer User ID					
IQPROID? N/A	N/A	N/A —	-	To be set on Windows	-				
IQPROPASWD s				IQproducer Password					
	N/A	_	-	To be set on Windows	-				
				IP Address Renew					
IPRENEW	N/A	-	-		-				
				To be set on Windows					

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
	N/A			IP Address Release	
IPRELEASE N/A	-	-	To be set on Windows	_	
MAGADO	N/A			MAC Address	
MACAD? N/A	IN/ A	_	-	To be set on Windows	_

Table F.6.7-1 Compatible List of Network Setup Device Messages (Cont'd)

F.6.8 Common Setup

Given below is the compatible list of the Common Setup device messages:

Table F.6.8-1 Compatible List of Common Setup Device Messages

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_COMSET	\checkmark	SCREEN UTIL_COMSET	N/A	Moves to the Common Setup screen This command is accepted but the screen is not moved.	_
BUZ ON OFF		BUZ ON OFF	N/A	Buzzer	:SYSTem:BEEPer ON OFF 0 1
BUZ?	\checkmark	BUZ?	N/A	Buzzer	:SYSTem:BEEPer?
REMDISP NORMAL REMA	V	REMDISP NORMAL REMAIN REMA RE MAIN_LAST	N/A	Remote Error Message Mode NORMAL: Clears the error message when the next command is received REMAINKeeps the first error message displayed REMA: Same as REMAIN REMAIN_LAST: Keeps the last error message displayed.	:DisplayERRor:MODE NORMal REMain LAST
REMDISP?	\checkmark	REMDISP?	N/A	Remote Error Message Mode	:DISPlay:ERRor:MODE ?
SCRCPYMEDIA HDD CF	\checkmark	SCRCPYMEDIA HDD CF	N/A	Screen Copy Media C drive when HDD is selected Devices other than HDD whose drive letter is the youngest, when CF is selected Default: HDD	_
SCRCPYMEDIA?	\checkmark	SCRCPYMEDIA?	N/A	Screen Copy Media	_

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
BITMAPS COLOR GRAY	\checkmark	BITMAPS COLOR GRAY REV MREV	N/A	Bitmap Setup COLOR:Color, GRAY:Monochrome, REV:Reverse MREV:Monochrome&Reverse	:MMEMory:STORe:SCRe en:THEMe NORMal REVerse MONO chrome MREVerse
BITMAPS?	\checkmark	BITMAPS?	N/A	Bitmap Setup	:MMEMory:STORe:SCRe en:THEMe?
TIMESET n1,n2,n3,n4,n5,n6	N/A	-	-	Time Set To be set on Windows	_
TIMESET?	N/A	-	-	Time Set To be set on Windows	_
ATTCHKDISP ON OFF	\checkmark	ATTCHKDISP ON OFF	N/A	Attenuator check Display Setting is acceptable but no display is made since no ATT error exists. Default: ON	_
ATTCHKDISP?		ATTCHKDISP?	N/A	Attenuator check Display	_

Table F.6.8-1 Compatible List of Common Setup Device Messages (Cont'd)

F.6.9 Maintenance Check

Given below is the compatible list of Maintenance Check device messages:

Table F.6.9-1 Con	npatible List of Maintenance	Check Device Messages
-------------------	------------------------------	-----------------------

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_MNTCHK	V	SCREEN UTIL_MNTCHK	N/A	Moves to the Maintenance Check screen This command is accepted but the screen is not moved.	_
ATTT?	\checkmark	ATTT?	N/A	Attenuator Count Always returns 0	-
RUNT?	\checkmark	RUNT?	N/A	Running Time Unit: Time (H)	:SystemINFormation: RTIMe?

F.6.10 Hardware Check

Given below is the compatible list of Hardware Check device messages.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_HDCHK	\checkmark	SCREEN UTIL_HDCHK	N/A	Moves to the Hardware Check screen This command is accepted but the screen is not moved.	_
SCREEN UTIL_HDCHK_OPT	\checkmark	SCREEN UTIL_HDCHK_OPT	N/A	Moves to the Option Hardware Check screen This command is accepted but the screen is not moved.	_
HWC?	N/A	_	-	Hardware Check result This function is not supported, since the HW structure is different.	_
HWCBER?	N/A	_	-	High-speed BER Hardware Check result This function is not supported, since the HW structure is different.	_

Table F.6.10-1 Compatible List of Hardware Check Device Messages (Cont'd)						
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)	
SERNUMCPU?	N/A		-	CPU port serial number	_	
BOARDCPUVER?	N/A	Not supported due to the different HW structure.	-	CPU port version number	_	
FPGACPUVER?	N/A	To obtain the information	-	CPU FPGA version number	_	
IPLVER?	N/A	about the hardware version, use the following:	-	IPL version number	_	
SOFTCPUVER?	N/A	:SYSTem:FPGA:VERSion?	-	CPU Software version number	_	
SERNUMIF?	N/A	<hardware> :SYSTem:FPGA:VERSion:</hardware>	-	IF port serial number	_	
BOARDIFVER?	N/A	CATalog?	-	IF port version number	_	
FPGADIGVER?	N/A	:SYSTem:HARDware:REVi sion? <hardware></hardware>	-	Baseband FPGA (Digital) version number	_	
FPGAANAVER?	N/A	:SYSTem:HARDware:REVi	-	Baseband FPGA (Analog) version number	_	
SERNUMRF?	N/A	- sion:CATalog?	-	RF port serial number	_	
BOARDRFVER?	N/A		-	RF port version number	_	
FPGARFVER?	N/A			-	RF FPGA version number	_
KEYENCVER?	N/A		-	Key Encoder version number	_	
SERNUMBER?	N/A		-	High-speed BER serial number	_	
BOARDBERVER?	N/A		-	High-speed BER port version number	_	
FPGABERVER?	N/A		-	High-speed BER FPGA version number	_	

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_PRDINF	\checkmark	SCREEN UTIL_PRDINF	N/A	Moves to the Product Information screen This command is accepted but the screen is not moved.	_
PTYPE?	\checkmark	PTYPE?	N/A	Product Type	:SYSTem:INFormation :TYPE?
PMODEL?	\checkmark	PMODEL?	N/A	Model Number	:SYSTem:INFormation :MODel?
SERNUM?	\checkmark	SERNUM?	N/A	Serial Number	:SYSTem:INFormation :SERial?
OPT? N	\checkmark	OPT? <integer></integer>	N/A	Confirms whether or not any Option exists Unavailable as it is as a compatible command, since the option structure differs from that of the MG3700A	_

 Table F.6.10-1
 Compatible List of Hardware Check Device Messages (Cont'd)

Given below is the compatible list of Install device messages.

Table F.6.11-1	Compatible List of Install Device Messages
----------------	--

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
SCREEN UTIL_INSTTOP	\checkmark	SCREEN UTIL_INSTTOP	N/A	Moves to the Install screen This command is accepted but the screen is not moved.	SCREEN UTIL_INSTTOP
SCREEN UTIL_INSTFRM	\checkmark	SCREEN UTIL_INSTFRM	N/A	Moves to the Firmware Install screen This command is accepted but the screen is not moved.	SCREEN UTIL_INSTFRM
SCREEN UTIL_INSTWV	\checkmark	SCREEN UTIL_INSTWV	N/A	Moves to the Waveform Data License Install screen This command is accepted but the screen is not moved.	SCREEN UTIL_INSTWV
FIRMINST s	N/A	_	N/A	Firmware Install	_
INSTMEDIA HDD CF	N/A	_	N/A	Install Source Media	_
INSTMEDIA?	N/A	_	N/A	Install Source Media	-
WVKEYNUM?		WVKEYNUM?	N/A	Waveform Data License Number	WVKEYNUM?
WVKEYNAME? n		WVKEYNAME? <integer></integer>	N/A	Waveform Data License Name	WVKEYNAME? <integer></integer>
WVKEYVER? s		WVKEYVER? <string></string>	N/A	Waveform Data License Version	WVKEYVER? <string></string>
WVINSTMEDIA HDD CF	V	WVINSTMEDIA HDD CF	N/A	Waveform Data license Install Source Media C drive, when HDD is selected Devices other than HDD whose drive letter is the youngest, when CF is selected Default: HDD	WVINSTMEDIA HDD CF
WVINSTMEDIA?	\checkmark	WVINSTMEDIA?	N/A	Waveform Data license Install Source Media	WVINSTMEDIA?

F.7 IEEE488.2 Common Commands

F.7.1 Common to IEEE488.2

Given below is the IEEE488.2 common command device messages available on the MG3710A/10E/40A.

MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
*CLS	\checkmark	*CLS	N/A	Clear Status Command	Same as the compatible command
*ESE	\checkmark	*ESE	N/A	Standard Event Status Enable Command	Same as the compatible command
*ESE?	\checkmark	*ESE?	N/A	Standard Event Status Enable Query	Same as the compatible command
*ESR?	\checkmark	*ESR?	N/A	Standard Event Status Register Query	Same as the compatible command
*IDN?	\checkmark	*IDN?	N/A	Identification Query	Same as the compatible command
*OPC	\checkmark	*OPC	N/A	Operation Complete Command	Same as the compatible command
*OPC?	\checkmark	*OPC?	N/A	Operation Complete Query	Same as the compatible command
*RST	\checkmark	*RST	N/A	Reset Command	Same as the compatible command
*SRE	\checkmark	*SRE	N/A	Service Request Enable Command	Same as the compatible command
*SRE?	\checkmark	*SRE?	N/A	Service Request Enable Query	Same as the compatible command

Table F.7.1-1 IEEE488.2 Common Device Messages

F	
78.	

Table F.7.1-1 IEEE488.2 Common Device Messages (Cont'd)					
MG3700A Commands	Com- patibility	MG3710A/10E/40A Commands (MG3700 mode)	SG 1/2	Remarks	MG3710A/10E/40A Commands (SCPI mode)
*STB	\checkmark	*STB	N/A	Read Status Byte Query	Same as the compatible command
*TRG	\checkmark	*TRG	N/A	Trigger Command	Same as the compatible command
*TST?	\checkmark	*TST?	N/A	Self Test Query	Same as the compatible command
*WAI	\checkmark	*WAI	N/A	Wait to Continue Command	Same as the compatible command

Appendix G SCPI Compatible Command

This appendix describes SCPI commands for signal generators supported by the MG3710A/MG3710E/MG3740A (hereafter "MG3710A/10E/40A").

Supported signal generators

Agilent

5	N5162A/	N5182A

G.1	Basic I	Function Commands	G-2
	G.1.1	Correction Subsystem	G-2
	G.1.2	Digital Modulation Subsystem	G-4
	G.1.3	Frequency Subsystem	G-10
	G.1.4	List/Sweep Subsystem	G-13
	G.1.5	Fast Subsystem	G-16
	G.1.6	Marker Subsystem	G-17
	G.1.7	Power Subsystem	G-19
G.2	Systen	n Commands	G-25
	G.2.1	Calibration Subsystem	G-25
	G.2.2	Communication Subsystem	G-27
	G.2.3	Display Subsystem	G-30
	G.2.4	IEEE 488.2 Common Commands	G-32
	G.2.5	Memory Subsystem	G-34
	G.2.6	Output Subsystem	G-39
	G.2.7	Route Subsystem	G-40
	G.2.8	Status Subsystem	G-41
	G.2.9	System Subsystem	G-44
	G.2.10) Trigger Subsystem	G-50
	G.2.11	Unit Subsystem	G-51
G.3	Analog	Modulation Commands	G-52
	G.3.1	Amplitude Modulation Subsystem	G-52
	G.3.2	Frequency Modulation Subsystem	G-54
	G.3.3	Phase Modulation Subsystem	G-56
	G.3.4	Pulse Modulation Subsystem	G-58
G.4	Arb Co	mmands	G-61
	G.4.1	All Subsystem	G-61
	G.4.2	Dual ARB Subsystem	G-62
	G.4.3	LARB Subsystem	G-71

G.1 Basic Function Commands

G.1.1 Correction Subsystem

Correction Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.1-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
<pre>[:SOURce]:CORRection:FLATness:FREQuency ? <point></point></pre>	\checkmark	[:SOURce[1] 2]:CORRection:FLATness:FRE Quency? <ext_integer></ext_integer>	
[:SOURce]:CORRection:FLATness:INITializ e:FSTep	N/A	Not supported.	
[:SOURce]:CORRection:FLATness:LOAD " <file name="">"</file>	\checkmark	[:SOURce[1] 2]:CORRection:FLATness:LOA D <string>[,<device>]</device></string>	
[:SOURce]:CORRection:FLATness:PAIR <freq.>[<freq suffix="">],<corr.>[<corr suffix>]</corr </corr.></freq></freq.>	\checkmark	<pre>[:SOURce[1] 2]:CORRection:FLATness:PAI R <freq>,<rel_ampl></rel_ampl></freq></pre>	
[:SOURce]:CORRection:FLATness:POINts?	\checkmark	[:SOURce[1] 2]:CORRection:FLATness:POI Nts?	
[:SOURce]:CORRection:FLATness:PRESet	\checkmark	[:SOURce[1] 2]:CORRection:FLATness:PRE Set	
[:SOURce]:CORRection:FLATness:STEP:POIN ts <points> MAXimum MINimum DEFault </points>	N/A	Not supported.	
[:SOURce]:CORRection:FLATness:STEP:POIN ts?[MAXimum MINimum]	N/A	Not supported.	
[:SOURce]:CORRection:FLATness:STEP:STAR t <freq><unit> MAXimum MINimum DEFault </unit></freq>	N/A	Not supported.	
[:SOURce]:CORRection:FLATness:STEP:STAR t? [MAXimum MINimum]	N/A	Not supported.	
[:SOURce]:CORRection:FLATness:STEP:STOP <freq><unit> MAXimum MINimum DEFault </unit></freq>	N/A	Not supported.	

N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Rem				
[:SOURce]:CORRection:FLATness:STEP:STOP ? [MAXimum MINimum]	N/A	Not supported.		
[:SOURce]:CORRection:FLATness:STORe " <file name="">"</file>	\checkmark	[:SOURce[1] 2]:CORRection:FLATness:STO Re <string>[,<device>]</device></string>	Folder fixed. Cannot use msus.	
[:SOURce]:CORRection:PMETer:CHANnel A B	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:CHANnel?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:DEVice <devicename></devicename>	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:DEVice?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:IP <ipaddress></ipaddress>	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:IP?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:PORT <portnumber></portnumber>	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :LAN:PORT?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :TYPE SOCKets SOCKETS VXI11 USB	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :TYPE?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :USB:DEVice <device></device>	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :USB:DEVice?	N/A	Not supported.		
[:SOURce]:CORRection:PMETer:COMMunicate :USB:LIST?	N/A	Not supported.		
[:SOURce]:CORRection[:STATe] ON OFF 1 0	\checkmark	[:SOURce[1] 2]:CORRection[:STATe] <boolean></boolean>		
[:SOURce]:CORRection[:STATe]?		[:SOURce[1] 2]:CORRection[:STATe]?		

G.1 Basic Function Commands

Table G.1.1-1	Correction Subsystem Device Messages (Cont'd)

Digital Modulation Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.2-1.

Table G.1.2-1	Digital Modulation Subsystem Devi	ce Messages
---------------	-----------------------------------	-------------

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:BURSt:STATe ON OFF 1 0	N/A	Not supported.	
[:SOURce]:BURSt:STATe?	N/A	Not supported.	
[:SOURce]:DM:CORRection:OPTimizati on RFOut EXTernal	N/A	Not supported.	
[:SOURce]:DM:CORRection:OPTimizati on?	N/A	Not supported.	
[:SOURce]:DM:EXTernal:POLarity NORMal INVert INVerted	\checkmark	[:SOURce[1] 2]:DM:EXTernal:POLarity NORMal INVert INVerted	
[:SOURce]:DM:EXTernal:POLarity?	\checkmark	[:SOURce[1] 2]:DM:EXTernal:POLarity?	
[:SOURce]:DM:INTernal:CHANnel:CORR ection[:STATe] ON OFF 1 0	\checkmark	[:SOURce[1] 2]:DM:INTernal:CHANnel:COR Rection[:STATe] <boolean></boolean>	
[:SOURce]:DM:INTernal:CHANnel:CORR ection[:STATe]?	\checkmark	[:SOURce[1] 2]:DM:INTernal:CHANnel:COR Rection[:STATe]?	
[:SOURce]:DM:INTernal:CHANnel:OPTi mization EVM ACP	N/A	Not supported.	

Table G. 1.2-1 Digital Modulation Subsystem Device Messages (Cont u)						
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks						
[:SOURce]:DM:INTernal:CHANnel:OPTi mization?	N/A	Not supported.				
[:SOURce]:DM:INTernal:EQUalization :FILTer:SELect "Filter"	N/A	Not supported.				
[:SOURce]:DM:INTernal:EQUalization :FILTer:SELect?	N/A	Not supported.				
[:SOURce]:DM:INTernal:EQUalization :FILTer:STATe ON OFF 1 0	N/A	Not supported.				
[:SOURce]:DM:INTernal:EQUalization :FILTer:STATe?	N/A	Not supported.				
[:SOURce]:DM:IQADjustment:DELay <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:DELay <time></time>				
[:SOURce]:DM:IQADjustment:DELay?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:DELay?				
[:SOURce]:DM:IQADjustment:EXTernal :CMRange COARse FINE	N/A	Not supported.				

Table G.1.2-1 Digital Modulation Subsystem Device Messages (Cont'd)

	N5	•

Table G.1.2-1 Digital Modulation Subsystem Device Messages (Cont'd)

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:DM:IQADjustment:EXTernal :CMRange?	N/A	Not supported.	
[:SOURce]:DM:IQADjustment:EXTernal :COFFset <value></value>	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: COFFset <voltage></voltage>	
[:SOURce]:DM:IQADjustment:EXTernal :COFFset?	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: COFFset?	
[:SOURce]:DM:IQADjustment:EXTernal :DIOFfset <value></value>	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: DIOFfset <voltage></voltage>	
[:SOURce]:DM:IQADjustment:EXTernal :DIOFfset?	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: DIOFfset?	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
[:SOURce]:DM:IQADjustment:EXTernal :DQOFfset <value></value>	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: DQOFfset <voltage></voltage>		
[:SOURce]:DM:IQADjustment:EXTernal :DQOFfset?	\checkmark	[:SOURce[1]]:DM:IQADjustment:EXTernal: DQOFfset?		
[:SOURce]:DM:IQADjustment:EXTernal :IOFFset <value></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:IOFFset <percent></percent>	Value is input in % units.	
[:SOURce]:DM:IQADjustment:EXTernal :IOFFset?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:IOFFset ?	Value is output in % units.	
[:SOURce]:DM:IQADjustment:EXTernal :QOFFset <value></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:QOFFset <percent></percent>	Value is input in % units.	
[:SOURce]:DM:IQADjustment:EXTernal :QOFFset?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:QOFFset ?	Value is output in % units.	
[:SOURce]:DM:IQADjustment:EXTernal :QSKew <value></value>	N/A	Not supported.		

Table G.1.2-1 Digital Modulation Subsystem Device Messages (Cont'd)

5	L)
C	0

Table G.1.2-1 Digital Modulation Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode)				
[:SOURce]:DM:IQADjustment:EXTernal :QSKew?	N/A			
[:SOURce]:DM:IQADjustment:GAIN <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:GAIN <rel_ampl></rel_ampl>		
[:SOURce]:DM:IQADjustment:GAIN?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:GAIN?		
[:SOURce]:DM:IQADjustment:IOFFset <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:IOFFset <percent></percent>		
[:SOURce]:DM:IQADjustment:IOFFset?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:IOFFset ?		
[:SOURce]:DM:IQADjustment:PHASe <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:PHASe <phase></phase>		
[:SOURce]:DM:IQADjustment:PHASe?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:PHASe?		
[:SOURce]:DM:IQADjustment:QOFFset	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:QOFFset <percent></percent>		

?

<angle>

 $\sqrt{}$

 $\sqrt{}$

[:SOURce]:DM:IQADjustment:QOFFset?

[:SOURce]:DM:IQADjustment:QSKew

<value>

[:SOURce[1]|2]:DM:IQADjustment:QOFFset

[:SOURce[1]|2]:DM:IQADjustment:QSKew

N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
[:SOURce]:DM:IQADjustment:QSKew?		[:SOURce[1] 2]:DM:IQADjustment:QSKew?			
[:SOURce]:DM:IQADjustment:SKEW <value></value>	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:SKEW <time></time>			
[:SOURce]:DM:IQADjustment:SKEW?	\checkmark	[:SOURce[1] 2]:DM:IQADjustment:SKEW?			
[:SOURce]:DM:IQADjustment[:STATe] ON OFF 1 0	N/A	Not supported.			
[:SOURce]:DM:IQADjustment[:STATe]?	N/A	Not supported.			
[:SOURce]:DM:POLarity[:ALL] NORMal INVert	\checkmark	[:SOURce[1] 2]:DM:POLarity[:ALL] NORMal INVert			
[:SOURce]:DM:POLarity?	\checkmark	[:SOURce[1] 2]:DM:POLarity[:ALL]?			
[:SOURce]:DM:SOURce EXTernal INTernal SUM	\checkmark	[:SOURce[1] 2]:DM:SOURce EXTernal INTernal	IQ signal source Cannot use SUM.		
[:SOURce]:DM:SOURce?		[:SOURce[1] 2]:DM:SOURce?	IQ signal source Cannot use SUM.		
[:SOURce]:DM:STATe ON OFF 1 0	N/A	Not supported.			
[:SOURce]:DM:STATe?	N/A	Not supported.			

Table G.1.2-1 Digital Modulation Subsystem Device Messages (Cont'd)

Frequency Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.3-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:FREQuency:CENTer <num>[<freq_suffix>] UP DOWN</freq_suffix></num>	\checkmark	[:SOURce[1]]:FREQuency:CENTer <freq></freq>	
[:SOURce]:FREQuency:CENTer? [MAXimum MINimum]	V	[:SOURce[1]]:FREQuency:CENTer?	
[:SOURce]:FREQuency:CHANnels:BAND <band></band>	\checkmark	[:SOURce[1] 2]:FREQuency:CHANnels:BAND <band></band>	
[:SOURce]:FREQuency:CHANnels:BAND?	V	[:SOURce[1] 2]:FREQuency:CHANnels:BAND ?	
<pre>[:SOURce]:FREQuency:CHANnels:NUMBe r <number></number></pre>	V	[:SOURce[1] 2]:FREQuency:CHANnels:NUMB er <integer></integer>	
[:SOURce]:FREQuency:CHANnels:NUMBe r?	V	[:SOURce[1] 2]:FREQuency:CHANnels:NUMB er?	
[:SOURce]:FREQuency:CHANnels[:STAT e] ON OFF 1 0	V	[:SOURce[1] 2]:FREQuency:CHANnels[:STA Te] <boolean></boolean>	
<pre>[:SOURce]:FREQuency:CHANnels[:STAT e]?</pre>	V	[:SOURce[1] 2]:FREQuency:CHANnels[:STA Te]?	
[:SOURce]:FREQuency[:CW] <value><unit></unit></value>	V	[:SOURce[1] 2]:FREQuency[:CW :FIXed] <freq></freq>	
[:SOURce]:FREQuency[:CW]?		[:SOURce[1] 2]:FREQuency[:CW :FIXed]?	
[:SOURce]:FREQuency:MODE CW FIXed LIST	\checkmark	[:SOURce[1] 2]:FREQuency:MODE CW FIXed LIST	
[:SOURce]:FREQuency:MODE?	V	[:SOURce[1] 2]:FREQuency:MODE?	

N5162A/N5182A Commands	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
[:SOURce]:FREQuency:MULTiplier <value></value>	V	[:SOURce[1] 2]:FREQuency:MULTiplier <ext_numeric></ext_numeric>	
[:SOURce]:FREQuency:MULTiplier?	\checkmark	[:SOURce[1] 2]:FREQuency:MULTiplier?	
[:SOURce]:FREQuency:OFFSet <value><unit></unit></value>	V	[:SOURce[1] 2]:FREQuency:OFFSet <freq></freq>	
[:SOURce]:FREQuency:OFFSet?	\checkmark	[:SOURce[1] 2]:FREQuency:OFFSet?	
[:SOURce]:FREQuency:OFFSet:STATe ON OFF 1 0	V	[:SOURce[1] 2]:FREQuency:OFFSet:STATe <boolean></boolean>	
[:SOURce]:FREQuency:OFFSet:STATe?	\checkmark	[:SOURce[1] 2]:FREQuency:OFFSet:STATe?	
[:SOURce]:FREQuency:REFerence <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:FREQuency:REFerence?	N/A	Not supported.	
[:SOURce]:FREQuency:REFerence:Set	N/A	Not supported.	
[:SOURce]:FREQuency:REFerence:STAT e ON OFF 1 0		[:SOURce[1] 2]:FREQuency:REFerence:STA Te <boolean></boolean>	
[:SOURce]:FREQuency:REFerence:STAT e?	V	[:SOURce[1] 2]:FREQuency:REFerence:STA Te?	
[:SOURce]:FREQuency:SPAN <num>[<freq_suffix>] UP DOWN</freq_suffix></num>	V	[:SOURce[1]]:FREQuency:SPAN <freq></freq>	
[:SOURce]:FREQuency:SPAN? [MAXimum MINimum]	V	[:SOURce[1]]:FREQuency:SPAN?	
[:SOURce]:FREQuency:STARt <value><unit></unit></value>	\checkmark	[:SOURce[1]]:FREQuency:STARt <freq></freq>	
[:SOURce]:FREQuency:STARt?	V	[:SOURce[1]]:FREQuency:STARt?	
[:SOURce]:FREQuency:STOP <value><unit></unit></value>		[:SOURce[1]]:FREQuency:STOP <freq></freq>	

Table G.1.3-1 Frequency Subsystem Device Messages (Cont'd)

Table G.1.3-1 Frequency Subsystem Device Messages (Cont'd)					
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
[:SOURce]:FREQuency:STOP?	\checkmark	[:SOURce[1]]:FREQuency:STOP?			
[:SOURce]:PHASe:REFerence	N/A	Not supported.			
[:SOURce]:PHASe[:ADJust] <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:PHASe[:ADJust] <ext_numeric></ext_numeric>			
[:SOURce]:PHASe[:ADJust]?	\checkmark	[:SOURce[1] 2]:PHASe[:ADJust]?			
[:SOURce]:ROSCillator:BANDwidth:EX Ternal <value>[<units>] NARRow WIDE MINimum MAXimum DEFault</units></value>	N/A	Not supported.			
[:SOURce]:ROSCillator:BANDwidth:EX Ternal? MINimum MAXimum	N/A	Not supported.			
[:SOURce]:ROSCillator:FREQuency:EX Ternal <value></value>	V	[:SOURce]:ROSCillator:FREQuency:EXTern al <freq></freq>			
[:SOURce]:ROSCillator:FREQuency:EX Ternal?	\checkmark	[:SOURce]:ROSCillator:FREQuency:EXTern al?			
[:SOURce]:ROSCillator:SOURce?		[:SOURce]:ROSCillator:SOURce?			
[:SOURce]:ROSCillator:SOURce:AUTO ON OFF 1 0	\checkmark	[:SOURce]:ROSCillator:SOURce:AUTO <boolean></boolean>			
[:SOURce]:ROSCillator:SOURce:AUTO?	√	[:SOURce]:ROSCillator:SOURce:AUTO?			

[:SOURce]:ROSCillator:SOURce:AUTO?

. ~ . 10

G.1.4 List/Sweep Subsystem

List/Sweep Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.4-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:LIST:CPOint?		[:SOURce]:LIST:CPOint?	
[:SOURce]:LIST:DIRection UP DOWN	\checkmark	[:SOURce]:LIST:DIRection UP DOWN	
[:SOURce]:LIST:DIRection?	\checkmark	[:SOURce]:LIST:DIRection?	
[:SOURce]:LIST:DWEL1 <value>{,<value>}</value></value>	N/A	Not supported.	
[:SOURce]:LIST:DWEL1?	N/A	Not supported.	
[:SOURce]:LIST:DWEL1:POINts?	\checkmark	[:SOURce]:LIST:DWEL1:POINts?	
[:SOURce]:LIST:DWEL1:TYPE LIST STEP	\checkmark	[:SOURce]:LIST:DWEL1:TYPE LIST STEP SWEep	
[:SOURce]:LIST:DWEL1:TYPE?		[:SOURce]:LIST:DWEL1:TYPE?	
[:SOURce]:LIST:FREQuency <value>{,<value>}</value></value>	N/A	Not supported.	
[:SOURce]:LIST:FREQuency?	N/A	Not supported.	
[:SOURce]:LIST:FREQuency:POINts?	\checkmark	[:SOURce]:LIST:FREQuency:POINts?	
[:SOURce]:LIST:MANual <value> UP DOWN</value>	\checkmark	[:SOURce]:LIST:MANual <value> UP DOWN</value>	

Table G.1.4-1 List/Sweep Subsystem Device Messages

Table G.1.4-1 List/Sweep Subsystem Device Messages (Cont'd)						
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks						
[:SOURce]:LIST:MANual?	\checkmark	[:SOURce]:LIST:MANual?				
[:SOURce]:LIST:MODE AUTO MANual		[:SOURce]:LIST:MODE AUTO MANual				
[:SOURce]:LIST:MODE?		[:SOURce]:LIST:MODE?				
[:SOURce]:LIST:OPTions <val>{,<val>}</val></val>	N/A	Not supported.				
[:SOURce]:LIST:OPTions?	N/A	Not supported.				
[:SOURce]:LIST:OPTions:POINts?	N/A	Not supported.				
[:SOURce]:LIST:POWer <value>{,<value>}</value></value>	N/A	Not supported.				
[:SOURce]:LIST:POWer?	N/A	Not supported.				
[:SOURce]:LIST:POWer:POINts?		[:SOURce]:LIST:POWer:POINts?				
[:SOURce]:LIST:RETRace ON OFF 1 0	N/A	Not supported.				
[:SOURce]:LIST:RETRace?	N/A	Not supported.				
[:SOURce]:LIST:TRIGger:SOURce BUS IMMediate EXTernal KEY TIMer MANua l	\checkmark	[:SOURce]:LIST:TRIGger:SOURce BUS IMMediate EXTernal KEY TIMer MANua 1				
[:SOURce]:LIST:TRIGger:SOURce?		[:SOURce]:LIST:TRIGger:SOURce?				
[:SOURce]:LIST:TYPE LIST STEP		[:SOURce]:LIST:TYPE LIST STEP				
[:SOURce]:LIST:TYPE?		[:SOURce]:LIST:TYPE?				
[:SOURce]:LIST:TYPE:LIST:INITialize:FS Tep	N/A	Not supported.				
[:SOURce]:LIST:TYPE:LIST:INITialize:PR ESet	\checkmark	[:SOURce]:LIST:TYPE:LIST:INITialize:PR ESet				

N5162A/N5182A Commands	N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
[:SOURce]:LIST:WAVeform <name>{,<name>}</name></name>	N/A	Not supported.				
[:SOURce]:LISt:WAVeform?	N/A	Not supported.				
[:SOURce]:LIST:WAVeform:POINts?		[:SOURce]:LIST:WAVeform:POINts?				
[:SOURce]:SWEep:CPOint?		[:SOURce]:SWEep:CPOint?				
[:SOURce]:SWEep:DWELl <value></value>		[:SOURce[1] 2]:SWEep:DWELl <time></time>				
[:SOURce]:SWEep:DWELl?		[:SOURce[1] 2]:SWEep:DWEL1?				
[:SOURce]:SWEep:POINts <value></value>		[:SOURce[1] 2]:SWEep:POINts <value></value>				
[:SOURce]:SWEep:POINts?	V	[:SOURce[1] 2]:SWEep:POINts?				
[:SOURce]:SWEep:SPACing LINear LOGarithmic	N/A	Not supported.				
[:SOURce]:SWEep:SPACing?	N/A	Not supported.				

Table G.1.4-1	List/Sweep Subs	system Device	Messages ((Cont'd)

G.1.5 Fast Subsystem

Fast Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.5-1.

Table G.1.5-1 Fast Subsystem Device Messages

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:FAST:FP <freq mhz="">, <power mdb=""></power></freq>	N/A	Not supported.	
:FAST:FREQuency <freq mhz=""></freq>	N/A	Not supported.	
:FAST:POWer <power mdb=""></power>	N/A	Not supported.	

G.1.6 Marker Subsystem

Marker Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.6-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:MARKer:AMPLitude[:STATe] ON OFF 1 0	N/A	Not supported.	
[:SOURce]:MARKer:AMPLitude[:STATe] ?	N/A	Not supported.	
[:SOURce]:MARKer:AMPLitude:VALue <num>[DB]</num>	N/A	Not supported.	
[:SOURce]:MARKer:AMPLitude:VALue?	N/A	Not supported.	
[:SOURce]:MARKer:AOFF	N/A	Not supported.	
[:SOURce]:MARKer:DELTa? <num>,<num></num></num>	N/A	Not supported.	
<pre>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8 ,9,10,11,12,13,14,15,16,17,18,19]: FREQuency <val><unit></unit></val></pre>	N/A	Not supported.	
[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8 ,9,10,11,12,13,14,15,16,17,18,19]: FREQuency? MAXimum MINimum	N/A	Not supported.	
[:SOURce]:MARKer:MODE FREQuency DELTa	N/A	Not supported.	
[:SOURce]:MARKer:MODE?	N/A	Not supported.	
[:SOURce]:MARKer:REFerence <marker></marker>	N/A	Not supported.	
[:SOURce]:MARKer:REFerence?	N/A	Not supported.	

Table G.1.6-1 Marker Subsystem Device Messages

G.1

Table G.1.6-1 Marker Subsystem Device Messages (Cont'd)			
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
<pre>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8 ,9,10,11,12,13,14,15,16,17,18,19][:STATe] ON OFF 1 0</pre>	N/A	Not supported.	
<pre>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8 ,9,10,11,12,13,14,15,16,17,18,19][:STATe]?</pre>	N/A	Not supported.	

G.1.7 Power Subsystem

Power Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.1.7-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:POWer:ALC:BANDwidth BWIDth <num>{freq suffix]</num>	N/A	Not supported.	
[:SOURce]:POWer:ALC:BANDwidth BWIDth?	N/A	Not supported.	
[:SOURce]:POWer:ALC:BANDwidth BWIDth:A UTO ON OFF 1 0	N/A	Not supported.	
[:SOURce]:POWer:ALC:BANDwidth BWIDth:A UTO?	N/A	Not supported.	
[:SOURce]:POWer:ALC:SEARch AUTO SPAN ON 1 ONCE	\checkmark	[:SOURce[1] 2]:POWer:ALC:SEARch [ONCE]	Only ONCE can be used.
[:SOURce]:POWer:ALC:SEARch?	\checkmark	[:SOURce[1] 2]:POWer:ALC:SEARch?	ONCE returns.
[:SOURce]:POWer:ALC:LEVel <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:POWer:ALC:LEVel?	N/A	Not supported.	
[:SOURce]:POWer:ALC:SEARch:REFerence RMS FIXed MANual MODulated	N/A	Not supported.	
[:SOURce]:POWer:ALC:SEARch:REFerence?	N/A	Not supported.	

 Table G.1.7-1
 Power Subsystem Device Messages

	Appendix G
	Appendix G SCPI Compatible Command
	Command

Table G.1.7-1 Power Subsystem Device Messages (Cont'd)						
N5162A/N5182A Commands	N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
[:SOURce]:POWer:ALC:SEARch:REFerence:L EVel <value></value>	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:REFerence:L EVel?	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:START <value><units></units></value>	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:START?	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:STOP <value><units></units></value>	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:STOP?	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:TYPE FULL USER	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN:TYPE?	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN[:STATe] ON OFF 1 0	N/A	Not supported.				
[:SOURce]:POWer:ALC:SEARch:SPAN[:STATe]?	N/A	Not supported.				

L

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:POWer:ALC:SOURce INTernal DIODe	N/A	Not supported.	
[:SOURce]:POWer:ALC:SOURce?	N/A	Not supported.	
[:SOURce]:POWer:ALC:SOURce:EXTernal:CO UPling <value>DB</value>	N/A	Not supported.	
[:SOURce]:POWer:ALC:SOURce:EXTernal:CO UPling?	N/A	Not supported.	
[:SOURce]:POWer:ALC[:STATe] ON OFF 1 0	N/A	Not supported.	
[:SOURce]:POWer:ALC[:STATe]?	N/A	Not supported.	
[:SOURce]:POWer:ATTenuation <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:POWer:ATTenuation?	N/A	Not supported.	
[:SOURce]:POWer:ATTenuation:AUTO ON OFF 1 0	\checkmark	[:SOURce]:POWer:ATTenuation:AUTO <boolean></boolean>	
[:SOURce]:POWer:ATTenuation:AUTO?	\checkmark	[:SOURce]:POWer:ATTenuation:AUTO?	

Table G 1 7-1	Power Subsystem	Device	Messages	(Cont'd)
	i ower oubsystem	Device	Messages	(Cont u)

Table G.1.7-1 Power Subsystem Device Messages (Cont'd)					
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
[:SOURce]:POWer:ATTenuation:BYPass ON OFF 1 0	N/A	Not supported.			
[:SOURce]:POWer:ATTenuation:BYPass?	N/A	Not supported.			
[:SOURce]:POWer[:LEVel][:IMMediate]:OF FSet <value><unit></unit></value>	\checkmark	<pre>[:SOURce[1] 2]:POWer[:LEVel][:IMMediat e]:OFFSet <rel_ampl></rel_ampl></pre>			
[:SOURce]:POWer[:LEVel][:IMMediate]:OF FSet?	\checkmark	[:SOURce[1] 2]:POWer[:LEVel][:IMMediat e]:OFFSet?			
[:SOURce]:POWer[:LEVel][:IMMediate][:A MPLitude] <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:POWer[:LEVel][:IMMediat e][:AMPLitude] <ampl></ampl>			
[:SOURce]:POWer[:LEVel][:IMMediate][:A MPLitude]?	\checkmark	[:SOURce[1] 2]:POWer[:LEVel][:IMMediat e][:AMPLitude]?			
[:SOURce]:POWer:MINimum:LIMit LOW HIGH	N/A	Not supported.			
[:SOURce]:POWer:MINimum:LIMit?	N/A	Not supported.			
[:SOURce]:POWer:MODE FIXed LIST		[:SOURce[1] 2]:POWer:MODE FIXed LIST			
[:SOURce]:POWer:MODE?	\checkmark	[:SOURce[1] 2]:POWer:MODE?			

vies Ma (ام له من 10 -- -_ **•** •

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:POWer:NOISe:[STATe] ON OFF 1 0	\checkmark	[:SOURce[1] 2]:POWer:NOISe:[STATe] <boolean></boolean>	
[:SOURce]:POWer:NOISe:[STATe]?	\checkmark	[:SOURce[1] 2]:POWer:NOISe:[STATe]?	
[:SOURce]:POWer:PROTection[:STATe] ON OFF 1 0	N/A	Not supported.	
[:SOURce]:POWer:PROTection[:STATe]?	N/A	Not supported.	
[:SOURce]:POWer:REFerence <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:POWer:REFerence?	\checkmark	[:SOURce[1] 2]:POWer:REFerence?	
[:SOURce]:POWer:REFerence:STATe ON OFF 1 0	\checkmark	[:SOURce[1] 2]:POWer:REFerence:STATe <boolean></boolean>	
[:SOURce]:POWer:REFerence:STATe?	\checkmark	[:SOURce[1] 2]:POWer:REFerence:STATe?	
[:SOURce]:POWer:STARt <value><unit></unit></value>	\checkmark	[:SOURce[1]]:POWer:STARt <ampl></ampl>	
[:SOURce]:POWer:STARt?	\checkmark	[:SOURce[1]]:POWer:STARt?	

 Table G.1.7-1
 Power Subsystem Device Messages (Cont'd)

Q
15
4

Table G.1.7-1 Power Subsystem Device Messages (Cont'd)			
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:POWer:STOP <value><unit></unit></value>	V	[:SOURce[1]]:POWer:STOP <ampl></ampl>	
[:SOURce]:POWer:STOP?	V	[:SOURce[1]]:POWer:STOP?	
[:SOURce]:POWer:USER:MAX <ampl></ampl>	V	[:SOURce[1] 2]:POWer:USER:MAX <ampl></ampl>	
[:SOURce]:POWer:USER:MAX?	V	[:SOURce[1] 2]:POWer:USER:MAX?	
[:SOURce]:POWer:USER:ENABle <0 1>	√	[:SOURce[1] 2]:POWer:USER:ENABle <boolean></boolean>	
[:SOURce]:POWer:USER:ENABle?	\checkmark	[:SOURce[1] 2]:POWer:USER:ENABle?	

G.2 System Commands

G.2.1 Calibration Subsystem

Calibration Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.1-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:CALibration:ALC:MODulator:BIAS	N/A	Not supported.	
:CALibration:BBG:CHANnel	\checkmark	:CALibration:BBG:CHANnel	
:CALibration:BBG:SKEW RFOut EXTernal, <value in="" ps=""></value>	N/A	Not supported.	
:CALibration:BBG:SKEW? RFOut EXTernal	N/A	Not supported.	
:CALibration:BBG:SKEW:RFOut	N/A	Not supported.	
:CALibration:DCFM	N/A	Not supported.	
:CALibration:IQ:DC	\checkmark	:CALibration[1] 2]:IQ:DC	
:CALibration:IQ:DEFault	\checkmark	:CALibration[1] 2]:IQ:DEFault	
:CALibration:IQ:FULL	\checkmark	:CALibration[1] 2]:IQ:FULL	
:CALibration:IQ:STARt <value><unit></unit></value>	N/A	Not supported.	
:CALibration:IQ:STARt?	N/A	Not supported.	
:CALibration:IQ:STOP <value><unit></unit></value>	N/A	Not supported.	
:CALibration:IQ:STOP?	N/A	Not supported.	

Table G.2.1-1	Calibration Subsystem Device Messages
---------------	---------------------------------------

Table G.2.1-1 Calibration Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks				
:CALibration:IQ:TYPE DC USER FULL	\checkmark	:CALibration[1] 2]:IQ:TYPE DC USER		
:CALibration:IQ:TYPE?	\checkmark	:CALibration[1] 2]:IQ:TYPE?		
:CALibration:IQ[:USER]	N/A	Not supported.		

Appendix G SCPI Compatible Command

G.2.2 Communication Subsystem

Communication Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.2-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:SYSTem:CAPability?	N/A	Not supported.	
:SYSTem:ERRor:CODe[:NEXT]?	V	:SYSTem:ERRor:CODe[:NEXT]?	
:SYSTem:ERRor[:NEXT]?	V	:SYSTem:ERRor[:NEXT]?	
:SYSTem:COMMunicate:GPIB:ADDRess <number></number>	\checkmark	:SYSTem:COMMunicate:GPIB:ADDRess <number></number>	
:SYSTem:COMMunicate:GPIB:ADDRess?		:SYSTem:COMMunicate:GPIB:ADDRess?	
:SYSTem:COMMunicate:GTLocal	ν	:SYSTem:COMMunicate:GTLocal	
:SYSTem:COMMunicate:LAN:CONFig DHCP MANual AUTO AIP	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:CONFig?	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DEFaults	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DESCription <string></string>	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DESCription?	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DHCP:TIMeout {30} 60 90 120sec	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DHCP:TIMeout?	N/A	Not supported.	
:SYSTem:COMMunicate:LAN:DOMain <string></string>	N/A	Not supported.	

G.2

System Commands

Q
10
00

Table G.2.2-1 Communication Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remain			Remarks	
:SYSTem:COMMunicate:LAN:DOMain?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS:DYNamic ON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS:DYNamic?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS:OVERride ON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS:OVERride?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS[:SERVer] <ipstring></ipstring>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:DNS[:SERVer]?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:GATeway " <ipstring>"</ipstring>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:GATeway?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:HOSTname " <string>"</string>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:HOSTname?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:IDENtify ON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:IP " <ipstring>"</ipstring>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:IP?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:KEEP:TIMeout <value></value>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:KEEP:TIMeout?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:KEEP[:STATe] ON OFF 1 0	N/A	Not supported.		

Table G.2.2-1 Communication Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks			
:SYSTem:COMMunicate:LAN:KEEP[:STATe]?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:MDNS ON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:MDNS?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:MONitor ON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:MONitor?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:NBIOsON OFF 1 0	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:NBIos?	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:RESTart	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:SUBNet " <ipstring>"</ipstring>	N/A	Not supported.		
:SYSTem:COMMunicate:LAN:SUBNet?	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:DEVice <devicename></devicename>	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:DEVice?	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:IP <ipaddr></ipaddr>	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:IP?	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:PORT <portnum></portnum>	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:PORT?	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:TYPE SOCKets SOCKETS VXI11 USB	N/A	Not supported.		
:SYSTem:COMMunicate:PMETer:TYPE?	N/A	Not supported.		

Table G.2.2-1 Communication Subsystem Device Messages (Cont'd)

G.2.3 Display Subsystem

Display Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.3-1.

Table G.2.3-1 Display Subsystem Device Messages	Table G.2.3-1	Display Subsystem Device Messages
---	---------------	-----------------------------------

N5162A/N5182A Commands	Compatibility	ompatibility MG3710A/10E/40A Commands (SCPI mode)	
:DISPlay:ANNotation:AMPLitude[:STATe] ON OFF 1 0	N/A	Not supported.	
:DISPlay:ANNotation:AMPLitude[:STATe]?	N/A	Not supported.	
:DISPlay:ANNotation:AMPLitude:UNIT DBM DBUV DBUVEMF V VEMF DB	1	:UNIT[1] 2:POWer DBM DBUV DBUVEMF	
:DISPlay:ANNotation:AMPLitude:UNIT?	\checkmark	:UNIT[1] 2:POWer?	
:DISPlay:ANNotation:FREQuency[:STATe] ON OFF 1 0	N/A	Not supported.	
:DISPlay:ANNotation:FREQuency[:STATe]?	N/A	Not supported.	
:DISPlay:ANNotation:CLOCk:DATE:FORMat MDY DMY	N/A	Not supported.	
:DISPlay:ANNotation:CLOCk:DATE:FORMat?	N/A	Not supported.	
:DISPlay:ANNotation:CLOCk[:STATe] ON OFF 1 0	N/A	Not supported.	
:DISPlay:ANNotation:CLOCk[:STATe]?	N/A	Not supported.	
:DISPlay:BRIGhtness <value></value>	N/A	Not supported.	
:DISPlay:BRIGhtness?	N/A	Not supported.	
:DISPlay:CAPTure	1	:MMEMory:STORe:SCReen [<filename>[,<device>]]</device></filename>	
:DISPlay:CMAP:DEFault [<palette:{bright} dark monochrome>]</palette:{bright} dark monochrome>	N/A	Not supported.	

N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCP		MG3710A/10E/40A Commands (SCPI mode)	Remarks
:DISPlay:CONTrast <value></value>	N/A	Not supported.	
:DISPlay:CONTrast?	N/A	Not supported.	
:DISPlay:REMote ON OFF 1 0	\checkmark	:DISPlay:ENABle ON OFF 1 0	
:DISPlay:REMote?	\checkmark	:DISPlay:ENABle?	
:DISPlay[:WINDow][:STATe] ON OFF 1 0		:DISPlay:ENABle ON OFF 1 0	
:DISPlay[:WINDow][:STATe]?		:DISPlay:ENABle?	

Table G.2.3-1 Display Subsystem Device Messages (Cont'd)

G.2.4 IEEE 488.2 Common Commands

IEEE 488.2 Common Commands device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.4-1.

Table G.2.4-1 IE	EEE 488.2 Common Comma	nds Device Messages
------------------	------------------------	---------------------

N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode)			Remarks
*CLS	\checkmark	*CLS	
*ESE <data></data>	ν	*ESE <integer></integer>	
*ESE?	\checkmark	*ESE?	
*ESR?	√	*ESR?	
*IDN?	√	*IDN?	
*OPC	√	*OPC	
*OPC?	√	*OPC?	
*OPT?	N/A	Not supported.	
*PSC ON OFF 1 0	N/A	Not supported.	
*PSC?	N/A	Not supported.	
*RCL <reg>,<seq></seq></reg>	N/A	Not supported.	
*RST		*RST	
*SAV <reg>,<seq></seq></reg>	N/A	Not supported.	
*SRE <data></data>	\checkmark	*SRE <integer></integer>	
*SRE?	ν	*SRE?	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks		
*STB?		*STB?			
*TRG		*TRG			
*TST?		*TST?			
*WAI	\checkmark	*WAI			

Table G.2.4-1 IEEE 488.2 Common Commands Device Messages (Cont'd)

G.2.5 Memory Subsystem

Memory Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.5-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:MEMory:CATalog:BINary?	N/A	Not supported.	
:MEMory:CATalog:DMOD?	N/A	Not supported.	
:MEMory:CATalog:FIR?	N/A	Not supported.	
:MEMory:CATalog:FSK?	N/A	Not supported.	
:MEMory:CATalog:IQ?	N/A	Not supported.	
:MEMory:CATalog:LIST?	N/A	Not supported.	
:MEMory:CATalog:MDMod?	N/A	Not supported.	
:MEMory:CATalog:MTONe?	N/A	Not supported.	
:MEMory:CATalog:PTRain?	N/A	Not supported.	
:MEMory:CATalog:SEQ?	N/A	Not supported.	
:MEMory:CATalog:STATe?	N/A	Not supported.	
:MEMory:CATalog:UFLT?	N/A	Not supported.	
:MEMory:CATalog[:ALL]?	N/A	Not supported.	
:MEMory:COPY[:NAME] " <file name="">","<file name="">"</file></file>	\checkmark	:MEMory[1] 2:COPY[:NAME] <string1>,<string2></string2></string1>	Only supports waveform pattern loading.
:MEMory:DATA " <file_name>",<data_block></data_block></file_name>	N/A	Not supported.	

Table G.2.5-1 Memory Subsystem Device Messages (Cont'd)					
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks		
:MEMory:DATA? " <file_name>"</file_name>	N/A	Not supported.			
:MEMory:DATA:APPend " <file_name>",<data_block></data_block></file_name>	N/A	Not supported.			
:MEMory:DATA:FIR " <file_name>",[REAL COMPlex],osr,coeffi cient</file_name>	N/A	Not supported.			
:MEMory:DATA:FIR?" <file_name>"</file_name>	N/A	Not supported.			
<pre>:MEMory:DATA:FSK "<file_name>",<num_states>,<f0>,<f1>,<f(n)>[,<diff_state>,<num_diff_states> ,<diff1>,<diff(n)>]</diff(n)></diff1></num_diff_states></diff_state></f(n)></f1></f0></num_states></file_name></pre>	N/A	Not supported.			
:MEMory:DATA:FSK? " <file_name>"</file_name>	N/A	Not supported.			
:MEMory:DATA:IQ " <file_name>",<offsetq>,<num_states>,<i 0>,<q0>,<il>,<q1>,<i(n)>,<q(n)>[,<di ff_state>,<num_diff_states>,<diff0>,<di ff1>,<diff(n)>]</diff(n)></di </diff0></num_diff_states></di </q(n)></i(n)></q1></il></q0></i </num_states></offsetq></file_name>	N/A	Not supported.			
:MEMory:DATA:IQ? " <file_name>"</file_name>	N/A	Not supported.			
:MEMory:DELete:ALL	N/A	Not supported.			
:MEMory:DELete:BINary	N/A	Not supported.			
:MEMory:DELete:DMOD	N/A	Not supported.			
:MEMory:DELete:FIR	N/A	Not supported.			
:MEMory:DELete:LIST	N/A	Not supported.			
:MEMory:DELete:MDMod	N/A	Not supported.			

Table G.2.5-1 Memory Subsystem Device Messages (Cont'd)

Table G.2.5-1 Memory Subsystem Device Messages (Cont'd)					
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks		
:MEMory:DELete:MTONe	N/A	Not supported.			
:MEMory:DELete:PTRain	N/A	Not supported.			
:MEMory:DELete:SEQ	N/A	Not supported.			
:MEMory:DELete:STATe	N/A	Not supported.			
:MEMory:DELete:UFLT	N/A	Not supported.			
:MEMory:DELete[:NAME] " <file name="">"</file>	N/A	Not supported.			
:MEMory:EXPort[:ASCii]:PTRAin <"filename">	N/A	Not supported.			
:MEMory:EXPort[:ASCii]:SEParator:COLumn TAB SEMicolon COMMa SPACe	N/A	Not supported.			
:MEMory:EXPort[:ASCii]:SEParator:COLumn ?	N/A	Not supported.			
:MEMory:EXPort[:ASCii]:SEParator:DECima l DOT COMMa	N/A	Not supported.			
:MEMory:EXPort[:ASCii]:SEParator:DECima 1?	N/A	Not supported.			
:MEMory:FREE[:ALL]?		:MEMory[1] 2:FREE[:ALL]? [<device>]</device>			
:MEMory:IMPort[:ASCii]:PTRain <"filename">	N/A	Not supported.			
:MEMory:IMPort[:ASCii]:SEParator:DECima l DOT COMMa	N/A	Not supported.			
:MEMory:IMPort[:ASCii]:SEParator:DECima 1?	N/A	Not supported.			
:MEMory:LOAD:LIST " <file name="">"</file>		:MMEMory:LOAD:LIST <string>[,<device>]</device></string>			
:MEMory:MOVE " <src_file>","<dest_file>"</dest_file></src_file>	N/A	Not supported.			

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:MEMory:SIZE? <"filename">	N/A	Not supported.	
:MEMory:STATe:COMMent <reg_num>,<seq_num>,"<comment>"</comment></seq_num></reg_num>	N/A	Not supported.	
:MEMory:STATe:COMMent? <reg_num>,<seq_num></seq_num></reg_num>	N/A	Not supported.	
:MEMory:STORe:LIST " <file name="">"</file>	\checkmark	:MMEMory:STORe:LIST <string>[,<device>]</device></string>	
:MMEMory:CATalog? " <msus>"</msus>	N/A	Not supported.	
:MMEMory:COPY " <file name="">", "<file name="">"</file></file>	\checkmark	:MMEMory[1] 2:COPY[:NAME] <string1>,<string2></string2></string1>	Only supports waveform pattern loading.
:MMEMory:DATA " <file name="">",<datablock></datablock></file>	N/A	Not supported.	
:MMEMory:DATA? " <file name="">"</file>	N/A	Not supported.	
:MMEMory:DELete:NVWFm	N/A	Not supported.	
:MMEMory:DELete:WFM	N/A	Not supported.	
:MMEMory:DELete[:NAME] " <file name>",["<msus>"]</msus></file 	N/A	Not supported.	
:MMEMory:HEADer:CLEar " <file name="">"</file>	N/A	Not supported.	
:MMEMory:HEADer:DESCription " <file name>","<description>"</description></file 	N/A	Not supported.	
:MMEMory:HEADer:DESCription? " <file name>"</file 	N/A	Not supported.	
:MMEMory:HEADer:ID? " <file name="">"</file>	N/A	Not supported.	
:MMEMory:LOAD:LIST " <file name="">"</file>	\checkmark	:MMEMory:LOAD:LIST <string>[,<device>]</device></string>	
:MMEMory:LOAD:PTRain <"filename">	N/A	Not supported.	

Table G.2.5-1	Memory Subs	system Device Messa	ages (Cont'd)

le G.2	2.5-1 N
	Com

N5162A/N5182A Commands Compatibility MG3710A/10E/40A Commands (SCPI mode) Remarks					
:MMEMory:LOAD:WFM:ALL	√	:MMEMory:LOAD:WFM:ALL [<device>]</device>			
:MMEMory:MOVE " <src_file>","<dest_file>"</dest_file></src_file>	N/A	Not supported.			
:MMEMory:STORe:LIST " <file name="">"</file>	V	:MMEMory:STORe:LIST <string>[,<device>]</device></string>			
:MMEMory:STORe:PTRain <"filename">	N/A	Not supported.			
:MMEMory:STORe:WFM:ALL	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:DEVic e <devicename></devicename>	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:DEVic e?	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:IP <ipaddr></ipaddr>	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:IP?	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:PORT <portnum></portnum>	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:LAN:PORT?	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:TYPE SOCKets SOCKETS VXI11	N/A	Not supported.			
:SYSTem:SANalyzer:COMMunicate:TYPE?	N/A	Not supported.			

Appendix G SCPI Compatible Command

G.2.6 Output Subsystem

Output Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.6-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:OUTPut:BLANking:AUTO ON OFF 1 0	N/A	Not supported.	
:OUTPut:BLANKing:AUTO?	N/A	Not supported.	
:OUTPut:BLANking:STATe ON OFF 1 0	N/A	Not supported.	
:OUTPut:BLANKing:STATe?	N/A	Not supported.	
:OUTPut:MODulation[:STATe] ON OFF 1 0	\checkmark	:OUTPut[1] 2:MODulation[:STATe] <boolean></boolean>	
:OUTPut:MODulation[:STATe]?	\checkmark	:OUTPut[1] 2:MODulation[:STATe]?	
:OUTPut:PROTection[:STATe] ON OFF 1 0	N/A	Not supported.	
:OUTPut:PROTection[:STATe]?	N/A	Not supported.	
:OUTPut[:STATe] ON OFF 1 0		:OUTPut[1] 2[:STATe] <boolean></boolean>	
:OUTPut[:STATe]?	\checkmark	:OUTPut[1] 2[:STATe]?	

Table G.2.6-1 Output Subsystem Device Messages

G.2.7 Route Subsystem

Route Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.7-1.

Table G.2.7-1	Route Subsystem Device Messages
---------------	---------------------------------

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:ROUTe[:CONNectors]:EVENt1 M1 M2 M3 M4	\checkmark	:ROUTe[:CONNectors]:EVENt1 2 3 M1 M2 M3 SF P1 P2 P3 PS10 PSYNc PVIDeo M12 M22 M32 PSYNc2 PVIDeo2	Cannot use M4.
:ROUTe[:CONNectors]:EVENt1?	\checkmark	:ROUTe[:CONNectors]:EVENt1 2 3?	
:ROUTe[:CONNectors]:SOUT SWEep SETTled PVIDeo SW8757	V	:ROUTe[:CONNectors]:SOUT SWEep SETTled	Cannot use SW8757 and PVIDeo.
:ROUTe:CONNectors:SOUT?	\checkmark	:ROUTe[:CONNectors]:SOUT?	
:ROUTe[:CONNectors]:TOUT SWEep SETTled PVIDeo PSYNc M1 M2 M3 M4	N/A	Not supported.	
:ROUTe[:CONNectors]:TOUT?	N/A	Not supported.	

G.2.8 Status Subsystem

Status Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.8-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:STATus:OPERation:CONDition?	\checkmark	:STATus:OPERation:CONDition?	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:ENABle <value></value>	\checkmark	:STATus:OPERation:ENABle <integer></integer>	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:ENABle?	\checkmark	:STATus:OPERation:ENABle?	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:NTRansition <value></value>	~	:STATus:OPERation:NTRansition <integer></integer>	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:NTRansition?	\checkmark	:STATus:OPERation:NTRansition?	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:PTRansition <value></value>	1	:STATus:OPERation:PTRansition <integer></integer>	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:PTRansition?	\checkmark	:STATus:OPERation:PTRansition?	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:SUPPress 0 1 ON OFF	\checkmark	:STATus:OPERation:SUPPress 0 1 ON OFF	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation:SUPPress?	\checkmark	:STATus:OPERation:SUPPress?	The layout of the register is that of the MG3710A/10E/40A.
:STATus:OPERation[:EVENt]?	\checkmark	:STATus:OPERation[:EVENt]?	The layout of the register is that of the MG3710A/10E/40A.

Table G.2.8-1 Status Subsystem Device Messages

Table G.2.8-1 Status Subsystem Device Messages (Cont'd)				
	Compatibility	MG3710A/10E/40A Commands (SCPI mode)		
	\checkmark	:STATus:PRESet		
:CONDit	N/A	Not supported.		
:ENABle	N/A	Not supported.		
:ENABle	N/A	Not supported.		
NTRans	N/A	Not supported.		
NTRans	N/A	Not supported.		
:PTRans	N/A	Not supported.		
:PTRans	N/A	Not supported.		
[:EVENt	N/A	Not supported.		

Appendix G SCPI Compatible Command

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:STATus:PRESet		:STATus:PRESet	
:STATus:QUEStionable:CALibration:CONDit ion?	N/A	Not supported.	
:STATus:QUEStionable:CALibration:ENABle <value></value>	N/A	Not supported.	
:STATus:QUEStionable:CALibration:ENABle ?	N/A	Not supported.	
:STATus:QUEStionable:CALibration:NTRans ition <value></value>	N/A	Not supported.	
:STATus:QUEStionable:CALibration:NTRans ition?	N/A	Not supported.	
:STATus:QUEStionable:CALibration:PTRans ition <value></value>	N/A	Not supported.	
:STATus:QUEStionable:CALibration:PTRans ition?	N/A	Not supported.	
:STATus:QUEStionable:CALibration[:EVENt]?	N/A	Not supported.	
:STATus:QUEStionable:CONDition?	N/A	Not supported.	
:STATus:QUEStionable:ENABle <value></value>	N/A	Not supported.	
:STATus:QUEStionable:ENABle?	N/A	Not supported.	
:STATus:QUEStionable:FREQuency:CONDitio n?	N/A	Not supported.	
:STATus:QUEStionable:FREQuency:ENABle <value></value>	N/A	Not supported.	
:STATus:QUEStionable:FREQuency:ENABle?	N/A	Not supported.	
:STATus:QUEStionable:FREQuency:NTRansit ion <value></value>	N/A	Not supported.	
:STATus:QUEStionable:FREQuency:NTRansit ion?	N/A	Not supported.	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
:STATus:QUEStionable:FREQuency:PTRansit ion <value></value>	N/A	Not supported.		
:STATus:QUEStionable:FREQuency:PTRansit ion?	N/A	Not supported.		
:STATus:QUEStionable:FREQuency[:EVENt]?	N/A	Not supported.		

Table G.2.8-1 Status Subsystem Device Messages (Cont'd)

G.2.9 System Subsystem

System Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.9-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:SYSTem:DATe <year>,<month>,<day></day></month></year>	N/A	Not supported.	
:SYSTem:DATe?	N/A	Not supported.	
:SYSTem:ERRor:CODE[:NEXt]?		:SYSTem:ERRor:CODE[:NEXt]?	
:SYSTem:ERRor[:NEXt]?		:SYSTem:ERRor[:NEXt]?	
:SYSTem:ERRor:SCPI[:SYNTax] ON OFF 1 0	N/A	Not supported.	
:SYSTem:ERRor:SCPI[:SYNTax]?	N/A	Not supported.	
:SYSTem:FILesystem:STORage:EXTernal?	N/A	Not supported.	
:SYSTem:FILesystem:STORage:EXTernal:PAT H <"USB media root path">	N/A	Not supported.	
:SYSTem:FILesystem:STORage:EXTernal:PAT H?	N/A	Not supported.	
:SYSTem:FILesystem:STORage:TYPE INTernal EXTernal	N/A	Not supported.	
:SYSTem:FILesystem:STORage:TYPE?	N/A	Not supported.	
:SYSTem:FILesystem:STORage:TYPE:AUTO ON OFF 1 0	N/A	Not supported.	
:SYSTem:FILesystem:STORage:TYPE:AUTO?	N/A	Not supported.	
:SYSTem:IDN "string"	N/A	Not supported.	

Table G.2.9-1 System Subsystem Device Messages

N5162A/N5182A Commands	Compatibility MG3710A/10E/40A Commands (SCPI m		Remarks
:SYSTem:LANGuage "SCPI" "COMP" "8648" "E4428C" "E4438C" "E8257D" "E8267D" "E8663B" "E8247C" "E8 257C" "E8267C" "E8241A" "E8244A" "E8251 A" "E8254A" "E8247C" "E8257C" "E8267C" "SMU200A" "SMATE200A" "SMJ100A" "SMIQ" "SML" "SMV" "3410"	\checkmark	:SYSTem:LANGuage "SCPI" "MG3700A"	
:SYSTem:LANGuage?	\checkmark	:SYSTem:LANGuage?	
:SYSTem:LICense:AUS[:DATE]?	N/A	Not supported.	
:SYSTem:LICense:EXTernal:LIST?	N/A	Not supported.	
:SYSTem:LICense:[FPACk:]WAVeform:ADD "filename"	N/A	Not supported.	
:SYSTem:LICense[:FPACk]:WAVeform:CLEar <slot_number></slot_number>	N/A	Not supported.	
:SYSTem:LICense[:FPACk]:WAVeform:FREE?	N/A	Not supported.	
:SYSTem:LICense:[FPACk]:WAVeform:IDList ?	N/A	Not supported.	
:SYSTem:LICense[:FPACk]:WAVeform:LOCK slot_number	N/A	Not supported.	
:SYSTem:LICense[:FPACk]:WAVeform:REPlac e slot_number, "filename"	N/A	Not supported.	
:SYSTem:LICense[:FPACk]:WAVeform:STATus ? slot_number	N/A	Not supported.	
:SYSTem:LICense:FPACk:WAVEform:USED?	N/A	Not supported.	
:SYSTem:LICense:INSTall <license_line> <block_of_license_lines></block_of_license_lines></license_line>	N/A	Not supported.	
:SYSTem:LICense:LIST?	N/A	Not supported.	

Table G.2.9-1 System Subsystem Device Messages (Cont'd)

Table G.2.9-1 System Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
:SYSTem:LICense:REMove <license_line></license_line>	N/A	Not supported.		
:SYSTem:OPT "string"	N/A	Not supported.		
:SYSTem:PDOWn	V	:SYSTem:PDOWn		
:SYSTem:PMETer[1] 2:CHANnel A B	N/A	Not supported.		
:SYSTem:PMETer[1] 2:CHANnel?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:DEV ice <devicename></devicename>	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:DEV ice?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:IP <ipaddress></ipaddress>	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:IP?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:POR T <portnumber></portnumber>	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:LAN:POR T?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:TYPE SOCKets SOCKETS VXI11 USB	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:TYPE?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:USB:DEV ice <device></device>	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:USB:DEV ice?	N/A	Not supported.		
:SYSTem:PMETer[1] 2:COMMunicate:USB:LIS T?	N/A	Not supported.		

N5162A/N5182A Commands	N5162A/N5182A Commands Compatibility		Remarks
:SYSTem:PMETer[1] 2:MEASure?	\checkmark	:SYSTem:PMETer[1] 2:MEASure?	
:SYSTEm:PMETer[1] 2:SENSe:AVERage:COUNt <avgcount></avgcount>	\checkmark	<pre> v :SYSTEm:PMETer[1] 2:SENSe:AVERage:COUN t <ext integer=""> </ext></pre>	
:SYSTEm:PMETer[1] 2:SENSe:AVERage:COUNt ?	\checkmark	:SYSTEm:PMETer[1] 2:SENSe:AVERage:COUN t?	
:SYSTEm:PMETer[1] 2:SENSe:AVERage:COUNt :AUTO ON OFF 1 0	N/A	Not supported.	
:SYSTEm:PMETer[1] 2:SENSe:AVERage:COUNt :AUTO?	N/A	Not supported.	
:SYSTem:PMETer[1] 2:SENSe:AVERage[:STAT e] ON OFF 1 0	\checkmark	:SYSTem:PMETer[1] 2:SENSe:AVERage[:STA Te] <boolean></boolean>	
:SYSTem:PMETer[1] 2:SENSe:AVERage[:STAT e]?	\checkmark	:SYSTem:PMETer[1] 2:SENSe:AVERage[:STA Te]?	
:SYSTem:PMETer[1] 2:SENSe:FREQuency[:CW :FIXed] <freq><unit></unit></freq>	\checkmark	:SYSTem:PMETer[1] 2:SENSe:FREQuency[:C W :FIXed] <freq></freq>	
:SYSTem:PMETer[1] 2:SENSe:FREQuency[:CW :FIXed]?	\checkmark	:SYSTem:PMETer[1] 2:SENSe:FREQuency[:C W :FIXed]?	
:SYSTem:PMETer[1] 2:UNIT:POWer DBM W	\checkmark	:SYSTem:PMETer[1] 2:UNIT:POWer DBM W	
:SYSTem:PMETer[1] 2:UNIT:POWer?	\checkmark	:SYSTem:PMETer[1] 2:UNIT:POWer?	
:SYSTem:PMETer[1] 2[:STATe] ON OFF 1 0	\checkmark	:SYSTem:PMETer[1] 2[:STATe] <boolean></boolean>	
:SYSTem:PMETer[1] 2[:STATe]?	\checkmark	:SYSTem:PMETer[1] 2[:STATe]?	
:SYSTem:PON:TYPE PRESet LAST USER	\checkmark	:SYSTem:PON:TYPE PRESet LAST	
:SYSTem:PON:TYPE?	\checkmark	:SYSTem:PON:TYPE?	
:SYSTem:PRESet	\checkmark	:SYSTem:PRESet	Executes preset

Table G.2.9-1 System Subsystem Device Messages (Cont'd)

Table G.2.9-1 System Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode) Rema		
:SYSTem:PRESet:ALL	N/A	Not supported.		
:SYSTem:PRESet:LANGuage "SCPI" "COMP" "8648" "E4428C" "E4438C" "E8257D" "E8267D" "E8663B" "E8247C" "E8 257C" "E8267C" "E442XB" "E443XB" "E8241 A" "E8244A" "E8251A" "E8254A" "E8247C" "E8257C" "E8267C" "SMU200A" "SMATE200A" "SMJ100A" "SMIQ" "SML" "SMV" "3410"	N/A	Not supported.		
:SYSTem:PRESet:LANGuage?	N/A	Not supported.		
:SYSTem:PRESet:PERSistent	N/A	Not supported.		
:SYSTem:PRESet:PN9 NORMal QUICk	N/A	Not supported.		
:SYSTem:PRESet:PN9?	N/A	Not supported.		
:SYSTem:PRESet:TYPE NORMal USER	N/A	Not supported.		
:SYSTem:PRESet:USER	N/A	Not supported.		
:SYSTem:PRESet[:USER]:SAVE	N/A	Not supported.		
:SYSTem:SECurity:DISPlay ON OFF 1 0	N/A	Not supported.		
:SYSTem:SECurity:DISPlay?	N/A	Not supported.		
:SYSTem:SECurity:DISPlay:RESTricted ON OFF 1 0	N/A	Not supported.		
:SYSTem:SECurity:DISPlay:RESTricted?	N/A	Not supported.		
:SYSTem:SECurity:ERASeall	N/A	Not supported.		
:SYSTem:SECurity:LEVel NONE ERASe OVERwrite SANitize	N/A	Not supported.		

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:SYSTem:SECurity:LEVel?	N/A	Not supported.	
:SYSTem:SECurity:LEVel:STATe ON OFF 1 0	N/A	Not supported.	
:SYSTem:SECurity:LEVel:STATe?	N/A	Not supported.	
:SYSTem:SECurity:OVERwrite	N/A	Not supported.	
:SYSTem:SECurity:SANitize	N/A	Not supported.	
:SYSTem:SSAVer:DELay <value></value>	N/A	Not supported.	
:SYSTem:SSAVer:DELay?	N/A	Not supported.	
:SYSTem:SSAVer:MODE LIGHt TEXT	N/A	Not supported.	
:SYSTem:SSAVer:MODE?	N/A	Not supported.	
:SYSTem:SSAVer:STATe ON OFF 1 0	N/A	Not supported.	
:SYSTem:SSAVer:STATe?	N/A	Not supported.	
:SYSTem:TIME <hour>,<minute>,<second></second></minute></hour>	N/A	Not supported.	
:SYSTem:TIME?	N/A	Not supported.	
:SYSTem:VERSion?		:SYSTem:VERSion?	

Table G 2 9-1	System Subsyst	em Device Messag	es (Cont'd)
	Oystern Oubsyst	cill Device messag	

G.2.10 Trigger Subsystem

Trigger Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.10-1.

Table G.2.10-1 Trigger Subsystem Device Messages

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:ABORt	N/A	Not supported.	
:INITiate:CONTinuous[:ALL] ON OFF 1 0	\checkmark	:INITiate:CONTinuous[:ALL] <boolean></boolean>	
:INITiate:CONTinuous[:ALL]?	\checkmark	:INITiate:CONTinuous[:ALL]?	
:INITiate[:IMMediate][:ALL]	\checkmark	:INITiate[:IMMediate][:ALL]	
:TRIGger:OUTPut:POLarity POSitive NEGative	N/A	Not supported.	
:TRIGger:OUTPut:POLarity?	N/A	Not supported.	
:TRIGger[:SEQuence]:SLOPe POSitive NEGative	\checkmark	:TRIGger[1] 2[:SEQuence]:SLOPe POSitive NEGative	
:TRIGger[:SEQuence]:SLOPe?	\checkmark	:TRIGger[1] 2[:SEQuence]:SLOPe?	
:TRIGger[:SEQuence]:SOURce BUS IMMediate EXTernal KEY TIMer	1	:TRIGger[1] 2[:SEQuence]:SOURce BUS IMMediate EXTernal KEY TIMer	TIMer cannot be selected. Turns Trigger off in selecting IMMediate
:TRIGger[:SEQuence]:SOURce?	\checkmark	:TRIGger[1] 2[:SEQuence]:SOURce?	Returns IMM when Trigger is off in selecting IMMediate
:TRIGger[:SEQuence]:TIMer <period></period>	\checkmark	:TRIGger[:SEQuence]:TIMer <time></time>	
:TRIGger[:SEQuence]:TIMer?	\checkmark	:TRIGger[:SEQuence]:TIMer?	
:TRIGger[:SEQuence][:IMMediate]	\checkmark	:TRIGger[:SEQuence][:IMMediate]	
[:SOURce]:TSWeep	\checkmark	[:SOURce]:TSWeep	

G.2.11 Unit Subsystem

Unit Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.2.11-1.

Table G.2.11-1 Unit Subsystem Device Messages	
---	--

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
:UNIT:POWer DBM DBUV DBUVEMF V VEMF DB	\checkmark	:UNIT[1] 2:POWer DBM DBUV DBUVEMF	V, VEMF, and DB cannot be selected.
:UNIT:POWer?	\checkmark	:UNIT[1] 2:POWer?	
:UNIT:VOLT:TYPE PD EMF	N/A	Not supported.	
:UNIT:VOLT:TYPE?	N/A	Not supported.	

G.3 Analog Modulation Commands

G.3.1 Amplitude Modulation Subsystem

Amplitude Modulation Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.3.1-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
A[:SOURce]:AM:EXTernal:COUPling AC DC	\checkmark	[:SOURce[1] 2]:AM:EXTernal:COUPling AC DC		
[:SOURce]:AM:EXTernal:COUPling?	\checkmark	[:SOURce[1] 2]:AM:EXTernal:COUPling?		
[:SOURce]:AM:INTernal:FREQuency <value><unit> UP DOWN</unit></value>	\checkmark	[:SOURce[1] 2]:AM[:AM[1] 2]:INTernal:F REQuency <freq></freq>		
[:SOURce]:AM:INTernal:FREQuency?	V	[:SOURce[1] 2]:AM[:AM[1] 2]:INTernal:F REQuency?		
[:SOURce]:AM:INTernal:FREQuency:STEP[:I NCRement] <num></num>	\checkmark	[:SOURce[1] 2]:AM:INTernal:FREQuency:S TEP[:INCRement] <freq></freq>		
[:SOURce]:AM:INTernal:FREQuency:STEP[:I NCRement]?	ν	[:SOURce[1] 2]:AM:INTernal:FREQuency:S TEP[:INCRement]?		
[:SOURce]:AM:INTernal:FUNCtion:SHAPe SINE	V	[:SOURce[1] 2]:AM[1] 2:INTernal:FUNCti on:SHAPe SINE TRIangle SQUare RAMP		
[:SOURce]:AM:INTernal:FUNCtion:SHAPe?	\checkmark	[:SOURce[1] 2]:AM[1] 2:INTernal:FUNCti on:SHAPe?		
[:SOURce]:AM:MODE DEEP NORMal	N/A	Not supported.		
[:SOURce]:AM:MODE?	N/A	Not supported.		
[:SOURce]:AM:SOURce INT EXT	\checkmark	[:SOURce[1] 2]:AM[1] 2:SOURce INT EXT		
[:SOURce]:AM:SOURce?		[:SOURce[1] 2]:AM[1] 2:SOURce?		

Table G.3.1-1 Amplitude Modulation Subsystem Device Messages

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode) Remark		
[:SOURce]:AM:STATe ON OFF 1 0	\checkmark	[:SOURce[1] 2]:AM[1] 2:STATe <boolean></boolean>		
[:SOURce]:AM:STATe?		[:SOURce[1] 2]:AM[1] 2:STATe?		
[:SOURce]:AM:TYPE LINear EXPonential	\checkmark	[:SOURce[1] 2]:AM:TYPE LINear EXPonential		
[:SOURce]:AM:TYPE?	\checkmark	[:SOURce[1] 2]:AM:TYPE?		
[:SOURce]:AM[:DEPTh]:EXPonential <value></value>	\checkmark	[:SOURce[1] 2]:AM[1] 2[:DEPTh]:EXPonen tial <rel_ampl></rel_ampl>		
[:SOURce]:AM[:DEPTh]:EXPonential?	\checkmark	[:SOURce[1] 2]:AM[1] 2[:DEPTh]:EXPonen tial?		
[:SOURce]:AM[:DEPTh]:STEP[:INCRement] <value><unit></unit></value>	N/A	Not supported.		
[:SOURce]:AM[:DEPTh]:STEP[:INCRement]?	N/A	Not supported.		
[:SOURce]:AM[:DEPTh][:LINear] <value><unit> UP DOWN</unit></value>	\checkmark	<pre>[:SOURce[1] 2]:AM[1] 2[:DEPTh][:LINear] <percent></percent></pre>		
[:SOURce]:AM[:DEPTh][:LINear]?	V	[:SOURce[1] 2]:AM[1] 2[:DEPTh][:LINear]?		

Table G.3.1-1 Amplitude Modulation Subsystem Device Messages (Cont'd)

G.3.2 Frequency Modulation Subsystem

Frequency Modulation Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.3.2-1.

Table G.3.2-1	Frequency	Modulation	Subsystem	Device Messages

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:FM:EXTernal:COUPling AC DC	\checkmark	[:SOURce[1] 2]:FM:EXTernal:COUPling AC DC	
[:SOURce]:FM:EXTernal:COUPling?	\checkmark	[:SOURce[1] 2]:FM:EXTernal:COUPling?	
[:SOURce]:FM:INTernal:FREQuency <value><unit> UP DOWN</unit></value>		[:SOURce[1] 2]:FM[1] 2:INTernal:FREQue ncy <freq></freq>	
[:SOURce]:FM:INTernal:FREQuency?	V	[:SOURce[1] 2]:FM[1] 2:INTernal:FREQue ncy?	
[:SOURce]:FM:INTernal:FREQuency:STEP[:I NCRement] <num></num>	V	[:SOURce[1] 2]:FM:INTernal:FREQuency:S TEP[:INCRement] <freq></freq>	
[:SOURce]:FM:INTernal:FREQuency:STEP[:I NCRement]?	V	[:SOURce[1] 2]:FM:INTernal:FREQuency:S TEP[:INCRement]?	
[:SOURce]:FM:INTernal:FUNCtion:SHAPe SINE	\checkmark	[:SOURce[1] 2]:FM[1] 2:INTernal:FUNCti on:SHAPe SINE SQUare RAMP PULSe	
[:SOURce]:FM:INTernal:FUNCtion:SHAPe?	\checkmark	[:SOURce[1] 2]:FM[1] 2:INTernal:FUNCti on:SHAPe?	
[:SOURce]:FM:SOURce INT EXT		[:SOURce[1] 2]:FM[1] 2:SOURce INT EXT	
[:SOURce]:FM:SOURce?		[:SOURce[1] 2]:FM[1] 2:SOURce?	
[:SOURce]:FM:STATe ON OFF 1 0		[:SOURce[1] 2]:FM[1] 2:STATe <boolean></boolean>	
[:SOURce]:FM:STATe?		[:SOURce[1] 2]:FM[1] 2:STATe?	
[:SOURce]:FM[:DEViation] <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:FM[1] 2[:DEViation] <freq></freq>	
[:SOURce]:FM[:DEViation]?	\checkmark	[:SOURce[1] 2]:FM[1] 2[:DEViation]?	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:FM[:DEViation]:STEP[:INCRemen t] <value><unit> GHz MHz kHz Hz</unit></value>	\checkmark	[:SOURce[1] 2]:FM[:DEViation]:STEP[:IN CRement] <freq>[,<sg>]</sg></freq>	
[:SOURce]:FM[:DEViation]:STEP[:INCRement]?	\checkmark	[:SOURce[1] 2]:FM[:DEViation]:STEP[:IN CRement]? [<sg>]</sg>	

Table G.3.2-1 Frequency Modulation Subsystem Device Messages (Cont'd)

G.3.3 Phase Modulation Subsystem

Phase Modulation Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.3.3-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:PM:BANDwidth BWIDth NORMal HIGH	N/A	Not supported.	
[:SOURce]:PM:BANDwidth BWIDth?	N/A	Not supported.	
[:SOURce]:PM:EXTernal:COUPling AC DC	\checkmark	[:SOURce[1] 2]:PM:EXTernal:COUPling AC DC	
[:SOURce]:PM:EXTernal:COUPling?		[:SOURce[1] 2]:PM:EXTernal:COUPling?	
[:SOURce]:PM:INTernal:FREQuency <value><unit> UP DOWN</unit></value>		[:SOURce[1] 2]:PM[1] 2:INTernal:FREQue ncy <freq></freq>	
[:SOURce]:PM:INTernal:FREQuency?		[:SOURce[1] 2]:PM[1] 2:INTernal:FREQue ncy?	
[:SOURce]:PM:INTernal:FREQuency:STEP[:I NCRement] <num></num>	V	[:SOURce[1] 2]:PM:INTernal:FREQuency:S TEP[:INCRement] <freq></freq>	
[:SOURce]:PM:INTernal:FREQuency:STEP[:I NCRement]?	\checkmark	[:SOURce[1] 2]:PM:INTernal:FREQuency:S TEP[:INCRement]?	
[:SOURce]:PM:INTernal:FUNCtion:SHAPe SINE	\checkmark	[:SOURce[1] 2]:PM[1] 2:INTernal:FUNCti on:SHAPe SINE SQUare TRIangle RAMP PULSe	
[:SOURce]:PM:INTernal:FUNCtion:SHAPe?	\checkmark	[:SOURce[1] 2]:PM[1] 2:INTernal:FUNCti on:SHAPe?	
[:SOURce]:PM:SOURce INT EXT	\checkmark	[:SOURce[1] 2]:PM:[PM[1] 2]:SOURce INT1 INT2 EXT	
[:SOURce]:PM:SOURce?		[:SOURce[1] 2]:PM:[PM[1] 2]:SOURce?	
[:SOURce]:PM:STATe ON OFF 1 0	\checkmark	[:SOURce[1] 2]:PM:[:PM[1] 2]:STATe <boolean></boolean>	
[:SOURce]:PM:STATe?		[:SOURce[1] 2]:PM:[:PM[1] 2]:STATe?	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:PM[:DEViation] <value><unit> UP DOWN</unit></value>	\checkmark	[:SOURce[1] 2]:PM[:DEViation] <ext_numeric></ext_numeric>	
[:SOURce]:PM[:DEViation]?	\checkmark	[:SOURce[1] 2]:PM[:DEViation]?	
[:SOURce]:PM[:DEViation]:STEP[:INCRemen t] <value><unit></unit></value>	\checkmark	[:SOURce]:PM[:DEViation]:STEP[:INCReme nt] <value><unit></unit></value>	
[:SOURce]:PM[:DEViation]:STEP[:INCRemen t]?	\checkmark	[:SOURce]:PM[:DEViation]:STEP[:INCReme nt]?	

Table G.3.3-1 Phase Modulation Subsystem Device Messages (Cont'd)

G.3.4 Pulse Modulation Subsystem

Pulse Modulation Subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.3.4-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:PULM:EXTernal:POLarity NORMal INVerted	\checkmark	[:SOURce]:PULM:EXTernal:POLarity NORMal INVerted	
[:SOURce]:PULM:EXTernal:POLarity?	\checkmark	[:SOURce]:PULM:EXTernal:POLarity?	
[:SOURce]:PULM:INTernal:DELay:STEP <num><time_suffix></time_suffix></num>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:DELay:STEP?	N/A	Not supported.	
[:SOURce]:PULM:INTernal:DELay[1] [2] <num><time_suffix> UP DOWN</time_suffix></num>	\checkmark	<pre>[:SOURce[1] 2]:PULM:INTernal:DELay[1] 2 <time></time></pre>	
[:SOURce]:PULM:INTernal:DELay[1] [2]	\checkmark	[:SOURce[1] 2]:PULM:INTernal:DELay[1] 2	
[:SOURce]:PULM:INTernal:FREQuency <frequency> MAXimum MINimum UP DOWN</frequency>	\checkmark	[:SOURce[1] 2]:PULM:INTernal:FREQuency <freq></freq>	
[:SOURce]:PULM:INTernal:FREQuency?	\checkmark	[:SOURce[1] 2]:PULM:INTernal:FREQuency ?	
[:SOURce]:PULM:INTernal:FREQuency:STEP[:INCRement] <freq> MAXimum MINimum DEFault</freq>	V	[:SOURce[1] 2]:PULM:INTernal:FREQuency :STEP[:INCRement] <freq></freq>	
[:SOURce]:PULM:INTernal:FREQuency:STEP[:INCRement]?	\checkmark	[:SOURce[1] 2]:PULM:INTernal:FREQuency :STEP[:INCRement]?	
[:SOURce]:PULM:INTernal:PERiod <period> MAXimum MINimum UP DOWN</period>	\checkmark	[:SOURce[1] 2]:PULM:INTernal:PERiod <time></time>	
[:SOURce]:PULM:INTernal:PERiod?	\checkmark	[:SOURce[1] 2]:PULM:INTernal:PERiod?	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:PULM:INTernal:PERiod:STEP[:IN CRement] <step> UP DOWN</step>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:PERiod:STEP[:IN CRement]?	N/A	Not supported.	
[:SOURce]:PULM:INTernal:PWIDth:STEP <num><time_suffix> MAXimum MINimum DEFa ult</time_suffix></num>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:PWIDth:STEP?	N/A	Not supported.	
[:SOURce]:PULM:INTernal:PWIDth[1] 2 <num><time_suffix> UP DOWN</time_suffix></num>		[:SOURce[1] 2]:PULM:INTernal:PWIDth[1] 2 <time></time>	
[:SOURce]:PULM:INTernal:PWIDth[1] 2?		[:SOURce[1] 2]:PULM:INTernal:PWIDth[1] 2?	
[:SOURce]:PULM:INTernal:TRAin:LIST:PRES et	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:OFFTime <value>{,<value>}</value></value>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:OFFTime?	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:ONTime <value>{,<value>}</value></value>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:ONTime?	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:REPetitio n <value>{,<value>}</value></value>	N/A	Not supported.	
[:SOURce]:PULM:INTernal:TRAin:REPetitio n?	N/A	Not supported.	
[:SOURce]:PULM:INTernal[1]:VIDeo:POLari ty NORMal INVerted	\checkmark	[:SOURce]:PULM:INTernal[1]:VIDeo:POLar ity NORMal INVerted	
[:SOURce]:PULM:INTernal[1]:VIDeo:POLari ty?	\checkmark	[:SOURce]:PULM:INTernal[1]:VIDeo:POLar ity?	
[:SOURce]:PULM:SOURce INTernal EXTernal		[:SOURce[1] 2]:PULM:SOURce INTernal EXTernal	

G.3 Analog Modulation Commands

T		
Table G.3.4-1	Pulse Modulation Subsystem De	vice Messages (Cont'd)

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:PULM:SOURce?	\checkmark	[:SOURce[1] 2]:PULM:SOURce?	
[:SOURce]:PULM:SOURce:INTernal SQUare FRUN TRIGgered ADOublet DOUBlet GATEd PTRain	\checkmark	[:SOURce[1] 2]:PULM:SOURce:INTernal SQUare FRUN TRIGgered ADOublet DOUBlet GATed	
[:SOURce]:PULM:SOURce:INTernal?		[:SOURce[1] 2]:PULM:SOURce:INTernal?	
[:SOURce]:PULM:STATe ON OFF 1 0	V	[:SOURce[1] 2]:PULM:STATe <boolean></boolean>	
[:SOURce]:PULM:STATe?		[:SOURce[1] 2]:PULM:STATe?	

G.4 Arb Commands

G.4.1 All Subsystem

All subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.4.1-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ALL:OFF	\checkmark	[:SOURce[1] 2]:RADio:ALL:OFF	ARB is turned off during execution.

Table G.4.1-1 All Subsystem Device Messages

G.4.2 Dual ARB Subsystem

Dual ARB subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.4.2-1.

TableG.4.2-1 Dual ARB Subsystem Device Messages

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ARB:BASeband:FREQuency: OFFSet <value><unit></unit></value>	\checkmark	[:SOURce[1] 2]:RADio:ARB:BASeband:FREQ uency:OFFSet <value><unit></unit></value>	Corresponds to the Offset A.
[:SOURce]:RADio:ARB:BASeband:FREQuency: OFFSet?	\checkmark	[:SOURce[1] 2]:RADio:ARB:BASeband:FREQ uency:OFFSet?	Corresponds to the Offset A.
[:SOURce]:RADio:ARB:BASeband:FREQuency: OFFSet:PHASe:RESet	N/A	Not supported.	
[:SOURce]:RADio:ARB:CLIPping " <file name>",IJQ IORQ,<value>[,<value>]</value></value></file 	N/A	Not supported.	
[:SOURce]:RADio:ARB:DOPRotection ON OFF 1 0	N/A	Not supported.	
[:SOURce]:RADio:ARB:DOPRotection?	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:ALPHa <value></value>	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:ALPHa?	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:BBT <value></value>	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:BBT?	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:CHANnel EVM ACP	N/A	Not supported.	
[:SOURce]:RADio[1]:ARB:FILTer:CHANnel?	N/A	Not supported.	

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
[:SOURce]:RADio:ARB:FILTer:TYPE RNYQuist NYQuist GAUSsian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ EDGE EWIDe EHSR WCDMa AC4Fm " <user FIR>"</user 	N/A	Not supported.		
[:SOURce]:RADio:ARB:FILTer:TYPE?	N/A	Not supported.		
[:SOURce]:RADio[1]:ARB:FILTer[:STATe]ON {OFF} 1 0	N/A	Not supported.		
<pre>[:SOURce]:RADio:ARB:GENerate:SINE ["<file_name>"][,<osr>],[<scale>],[I Q IQ][<phasedeg>]</phasedeg></scale></osr></file_name></pre>	N/A	Not supported.		
[:SOURce]:RADio:ARB:GENerate:TEST:WAVef orms	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADer:CLEar	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADER:NOISe:RMS:OV ERride" <file_name>",<value> UNSPecified</value></file_name>	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADER:NOISe:RMS:OV ERride? " <file_name>"</file_name>	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADER:RMS " <file_name>",<value> UNSPecified</value></file_name>	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADER:RMS? " <file_name>"</file_name>	N/A	Not supported.		
[:SOURce]:RADio:ARB:HEADer:SAVE	N/A	Not supported.		
[:SOURce]:RADio:ARB:IQ:MODulation:ATTen <value></value>	N/A	Not supported.		
[:SOURce]:RADio:ARB:IQ:MODulation:ATTen ?	N/A	Not supported.		

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)

	Appendix G
	Appendix G SCPI Compatible Command
	le Command

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
[:SOURce]:RADio:ARB:IQ:MODulation:A TTen:AUTO ON OFF 1 0	N/A	Not supported.		
[:SOURce]:RADio:ARB:IQ:MODulation:ATTen :AUTO?	N/A	Not supported.		
<pre>[:SOURce]:RADio:ARB:MARKer:CLEar "<file_name>",<marker>,<first_point>,<l ast_point=""></l></first_point></marker></file_name></pre>	N/A	Not supported.		
<pre>[:SOURce]:RADio:ARB:MARKer:CLEar:ALL "<file_name>",<marker></marker></file_name></pre>	N/A	Not supported.		
[:SOURce]:RADio:ARB:MARKer:ROTate " <file_name>",<rotate_count></rotate_count></file_name>	N/A	Not supported.		
<pre>[:SOURce]:RADio:ARB:MARKer[:SET] "<file_name>",<marker>,<first_point>,<l ast_point="">,<skip_count></skip_count></l></first_point></marker></file_name></pre>	N/A	Not supported.		
[:SOURce]:RADio:ARB:MBSync OFF MASTer SLAVe	\checkmark	[:SOURce]:RADio:ARB:MBSync OFF SG12 PRIMary SECondary		
[:SOURce]:RADio:ARB:MBSync?	\checkmark	[:SOURce]:RADio:ARB:MBSync?		
[:SOURce]:RADio:ARB:MBSync:NSLaves <value></value>	\checkmark	[:SOURce]:RADio:ARB:MBSync:NSECondaries <ext_integer></ext_integer>		
[:SOURce]:RADio:ARB:MBSync:NSLaves?	\checkmark	[:SOURce]:RADio:ARB:MBSync:NSECondaries?		
[:SOURce]:RADio:ARB:MBSync:SLISten		[:SOURce]:RADio:ARB:MBSync:SLISten		
[:SOURce]:RADio:ARB:MBSync:SREFerence <value></value>	\checkmark	[:SOURce]:RADio:ARB:MBSync:SREFerence <ext_integer></ext_integer>		
[:SOURce]:RADio:ARB:MBSync:SREFerence?		[:SOURce]:RADio:ARB:MBSync:SREFerence?		
[:SOURce]:RADio:ARB:MBSync:SSLaves	\checkmark	[:SOURce]:RADio:ARB:MBSync:SSECondaries		

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ARB:MDEStination:AL CHold NONE M1 M2 M3 M4	N/A	Not supported.	
[:SOURce]:RADio:ARB:MDEStination:ALCHol d?	N/A	Not supported.	
[:SOURce]:RADio:ARB:MDEStination:PULSe NONE M1 M2 M3 M4	N/A	Not supported.	
[:SOURce]:RADio:ARB:MDEStination:PULSe?	N/A	Not supported.	
[:SOURce]:RADio:ARB:MPOLarity:MARKer1 2 3 4 NEGative POSitive	\checkmark	[:SOURce]:RADio:ARB:MPOLarity:MARKer1 2 3 NEGative POSitive	MARKer4 is not supported
<pre>[:SOURce]:RADio:ARB:MPOLarity:MARKer1 2 3 4?</pre>	\checkmark	[:SOURce]:RADio:ARB:MPOLarity:MARKer1 2 3?	MARKer4 is not supported
[:SOURce]:RADio:ARB:NOISe:BANDwidth <value><unit></unit></value>		[:SOURce[1] 2]:RADio:ARB:NOISe:BANDWid th <freq></freq>	
[:SOURce]:RADio:ARB:NOISe:BANDwidth?		[:SOURce[1] 2]:RADio:ARB:NOISe:BANDWid th?	
[:SOURce]:RADio:ARB:NOISe:CBRate <1bps - 999Mbps>	N/A	Not supported.	
[:SOURce]:RADio:ARB:NOISe:CBRate?	N/A	Not supported.	
[:SOURce]:RADio:ARB:NOISe:CBWidth <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:RADio:ARB:NOISe:CBWidth?	N/A	Not supported.	
[:SOURce]:RADio:ARB:NOISe:CN <value><unit></unit></value>		[:SOURce[1] 2]:RADio:ARB:NOISe:CN <rel_ampl></rel_ampl>	
[:SOURce]:RADio:ARB:NOISe:CN?		[:SOURce[1] 2]:RADio:ARB:NOISe:CN?	
[:SOURce]:RADio:ARB:NOISe:CNFormat CN EBNO	N/A	Not supported.	

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)				
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks	
[:SOURce]:RADio:ARB:NOISe:CNFormat?	N/A	Not supported.		
[:SOURce]:RADio:ARB:NOISe:EBNO <ebno db="" in=""></ebno>	N/A	Not supported.		
[:SOURce]:RADio:ARB:NOISe:EBNO?	N/A	Not supported.		
[:SOURce]:RADio[1]:ARB:NOISe:MUX SUM CARRier NOISe	N/A	Not supported.		
[:SOURce]:RADio[1]:ARB:NOISe:MUX?	N/A	Not supported.		
[:SOURce]:RADio:ARB:NOISe:POWer:CARRier <carrierpower></carrierpower>		[:SOURce[1] 2]:RADio:ARB:NOISe:POWer:C ARRier <ampl></ampl>		
[:SOURce]:RADio:ARB:NOISe:POWer:CARRier ?	\checkmark	[:SOURce[1] 2]:RADio:ARB:NOISe:POWer:C ARRier?		
[:SOURce]:RADio:ARB:NOISe:POWer:CONTrol [:MODE]{TOTal} CARRier NOISe		[:SOURce[1] 2]:RADio:ARB:NOISe:POWer:C ONTrol[:MODE] TOTal CARRier NOISe		
[:SOURce]:RADio:ARB:NOISe:POWer:CONTrol [:MODE]?		[:SOURce[1] 2]:RADio:ARB:NOISe:POWer:C ONTrol[:MODE]?		
[:SOURce]:RADio:ARB:NOISe:POWer:NOISe:C HANnel?		[:SOURce[1] 2]:RADio:ARB:NOISe:POWer:N OISe:CHANnel?		
[:SOURce]:RADio:ARB:NOISe:POWer:NOISe:T OTal <totalnoisepowerindbm></totalnoisepowerindbm>	N/A	Not supported.		
[:SOURce]:RADio:ARB:NOISe:POWer:NOISe:T OTal?	N/A	Not supported.		
[:SOURce]:RADio:ARB:NOISe[:STATe] ON OFF 1 0	\checkmark	[:SOURce[1] 2]:RADio:ARB:NOISe[:STATe] <boolean></boolean>		
[:SOURce]:RADio:ARB:NOISe[:STATe]?		[:SOURce[1] 2]:RADio:ARB:NOISe[:STATe] ?		
[:SOURce]:RADio:ARB:PHASe:NOISe:F1 <value><unit></unit></value>	N/A	Not supported.		

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ARB:PHASe:NOISe:F1?	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe:F2 <value><unit></unit></value>	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe:F2?	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe:LMID <value></value>	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe:LMID?	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe[:STATe] ON OFF 1 0	N/A	Not supported.	
[:SOURce]:RADio:ARB:PHASe:NOISe[:STATe] ?	N/A	Not supported.	
[:SOURce]:RADio:ARB:REGister[:STATus]?		[:SOURce[1] 2]:RADio:ARB:REGister[:STA Tus]?	
[:SOURce]:RADio:ARB:RETRigger ON OFF 1 0 IMMediate	\checkmark	[:SOURce[1] 2]:RADio:ARB:RETRigger ON OFF 1 0 IMMediate	
[:SOURce]:RADio:ARB:RETRigger?	\checkmark	[:SOURce[1] 2]:RADio:ARB:RETRigger?	
[:SOURce]:RADio:ARB:RSCaling <value></value>	N/A	Not supported.	
[:SOURce]:RADio:ARB:RSCaling?	N/A	Not supported.	
[:SOURce]:RADio:ARB:SCALing " <file_name>",<value></value></file_name>	N/A	Not supported.	
[:SOURce]:RADio:ARB:SCLock:RATE <value></value>	N/A	Not supported.	
[:SOURce]:RADio:ARB:SCLock:RATE?	\checkmark	[:SOURce[1] 2]:RADio:ARB:SCLock:RATE?	

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)

Appendix G	
SCPI Compatible	
Command	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
<pre>[:SOURce]:RADio:ARB:SEQuence[:MWAVe form] <filename>, <waveform1>, <reps>, NONE M1 M2 M3 M4 M1M2 M1M3 M1M4 M2M3 M2M 4 M3M4 M1M2M3 M1M2M4 M1M3M4 M2M3M4 M1M2M3M4 ALL, {, <waveform2>, <reps>, N ONE M1 M2 M3 M4 M1M2 M1M3 M1M4 M2M3 M2M4 M3M4 M1M2M3 M1M2M4 M1M3M4 M2M 3M4 M1M2M3M4 ALL, }</reps></waveform2></reps></waveform1></filename></pre>	N/A	Not supported.	
<pre>[:SOURce]:RADio:ARB:SEQuence[:MWAVeform]? <filename></filename></pre>	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger:TYPE CONTinuous SINGle GATE SADVance	V	[:SOURce[1] 2]:RADio:ARB:TRIGger:TYPE CONTinuous SINGle	CONTinuous: MG3710A/10E/40A is set to Off. SINGle: MG3710A/10E/40A is set to On. GATE SADVance cannot be used.
[:SOURce]:RADio:ARB:TRIGger:TYPE?	V	[:SOURce[1] 2]:RADio:ARB:TRIGger:TYPE?	CONTinuous: MG3710A/10E/40A is set to Off. SINGle: MG3710A/10E/40A is set to On. GATE SADVance cannot be used.
[:SOURce]:RADio:ARB:TRIGger:TYPE:CONTin uous[:TYPE] FREE TRIGger RESet	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger:TYPE:CONTin uous[:TYPE]?	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger:TYPE:GATE LOW HIGH	N/A	Not supported.	

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ARB:TRIGger:TYPE:GATE?	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVan ce[:TYPE] SINGle CONTinuous	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVan ce[:TYPE]?	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger[:SOURce] KEY EXT BUS	V	[:SOURce[1] 2]:RADio:ARB:TRIGger:S OURce KEY EXT BUS	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]?		[:SOURce[1] 2]:RADio:ARB:TRIGger:SOURc e?	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:DELay <value></value>	V	[:SOURce[1] 2]:RADio:ARB:TRIGger[:SOUR ce]:EXTernal:DELay <time></time>	The argument is <time> in the MG3710A/10E/40A Commands (SCPI mode).</time>
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:DELay?	V	[:SOURce[1] 2]:RADio:ARB:TRIGger[:SOUR ce]:EXTernal:DELay?	The argument is <time> in the MG3710A/10E/40A Commands (SCPI mode).</time>
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:DELay:STATe ON OFF 1 0	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:DELay:STATe?	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:SLOPe POSitive NEGative		[:SOURce[1] 2]:RADio:ARB:TRIGger[:SOUR ce]:EXTernal:SLOPe POSitive NEGative	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal:SLOPe?		[:SOURce[1] 2]:RADio:ARB:TRIGger[:SOUR ce]:EXTernal:SLOPe?	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal[:SOURce] EPT1 EPT2 EPTRIGGER1 EPTRIGGER2	N/A	Not supported.	
[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EX Ternal[:SOURce]?	N/A	Not supported.	

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)

Appendix G	
SCPI Compatible Compat	
ommand	

Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont'd)			
N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:ARB:WAVeform "WFM1:file_name" "SEQ:file_name"	V	[:SOURce[1] 2]:RADio:ARB:WAVeform <string></string>	
[:SOURce]:RADio:ARB:WAVeform?	\checkmark	[:SOURce[1] 2]:RADio:ARB:WAVeform?	
[:SOURce]:RADio:ARB:WAVeform:NHEaders "WFM1:file_name" "SEQ:filename"	N	[:SOURce[1] 2]:RADio:ARB:WAVeform:NHEa ders <string></string>	
[:SOURce]:RADio:ARB:WAVeform:NHEade rs?	\checkmark	[:SOURce[1] 2]:RADio:ARB:WAVeform: NHEaders?	
[:SOURce]:RADio:ARB[:STATe] ON OFF 1 0	V	[:SOURce[1] 2]:RADio:ARB[:STATe] <boolean></boolean>	
[:SOURce]:RADio:ARB[:STATe]?	\checkmark	[:SOURce[1] 2]:RADio:ARB[:STATe]?	

G.4.3 LARB Subsystem

LARB subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table G.4.3-1.

N5162A/N5182A Commands	Compatibility	MG3710A/10E/40A Commands (SCPI mode)	Remarks
[:SOURce]:RADio:LARB[:STATe] ON OFF 1 0	\checkmark	[:SOURce]:RADio:LARB[:STATe] <boolean></boolean>	
[:SOURce]:RADio:LARB[:STATe]?	\checkmark	[:SOURce]:RADio:LARB[:STATe]?	

Table G.4.3-1 LARB Subsystem Device Messages

Appendix G SCPI Compatible Command

Appendix H Panel Keys and Keyboard Operations

Panel Key	USB Keyboard
Preset Preset	Ctrl+Shift+R
	Ctrl+Shift+O
Cal Cal	Ctrl+Shift+9
Save Save	Ctrl+S
Recall Recall	Ctrl+O
Сору Сору	Ctrl+Shift+8
	Ctrl+Shift+↑
F1 F1	F1
F2 F2	F2
F3 F3	F3
F4 F4	F4
F5 F5	F5
F6 F6	F6
F7 F7	F7
F8 F8	F8
→ More	$Ctrl+Shift+ \rightarrow$
🕑 Back	$Ctrl+Shift+ \leftarrow$
SG1 SG1	Ctrl+Shift+U
SG2 SG2	Ctrl+Shift+I
IQpro IQpro	Ctrl+Shift+P
Frequency Frequency	Ctrl+Shift+Y
Sweep/List	Ctrl+Shift+6
AM AM	Ctrl+Shift+1
	Ctrl+Alt+X
Level Level	Ctrl+Shift+L
Mode Mode	Ctrl+Alt+V
^{FM} ^{₽M} FM/φM	Ctrl+Shift+5
AUX Fctn AUX Fctn	Ctrl+Shift+3
Load Load	Ctrl+Shift+F1
Select Select	Ctrl+Shift+F2
Pulse Pulse	Ctrl+Shift+4
Utility Utility	Ctrl+Alt+B

Table H-1 Correspondences Between Panel Keys and Keyboard Operations

Note:

The figure in Ctrl+Shift+"figure" cannot be entered by the numeric keypad.

Table H-1 Correspondences Between Panel Keys and Keyboard Operations (Cont'd) Panel Key **USB Keyboard** 0 0 0 1 1 1 $\mathbf{2}$ $\mathbf{2}$ 2 3 З 3 4 4 4 5 $\mathbf{5}$ $\mathbf{5}$ 6 6 6 7 7 78 8 8 9 9 9 А 4 А В В 5 С \mathbf{C} + 💿 D + 7 D Е Е + 8 9 \mathbf{F} \mathbf{F} . _/+ _ -/-Tab Tab Shift Shift BSBack Space BS Ctrl Ctrl Alt Alt Alt Alt Tab Alt+Tab Cancel Esc Cancel Help Ctrl+Shift+H Help Enter Enter Enter Incr Set Incr Set Ctrl+Shift+7 Application, Right-click of a Context Context mouse Windows Windows + Context

Appendix H Panel Keys and Keyboard Operations

Note:

The figure in Ctrl+Shift+"figure" cannot be entered by the numeric keypad.

Panel Key		USB Keyboard	
\frown \uparrow		\uparrow	
\rightarrow \rightarrow		\rightarrow	
\smile \downarrow		\downarrow	
\rightarrow \geq		←	
0	Rotary knob, clockwise	Mouse wheel up	
	Rotary knob, counter-clockwise	Mouse wheel down	
Mod Mod On/Off		Ctrl+Shift+Q	
on/off RF Output On/Off		Ctrl+Shift+G	
Mod On/Off 2	nd RF Output Mod On/Off	Ctrl+Shift+E	
On/Off 2	nd RF Output On/Off	Ctrl+Shift+S	

 Table H-1
 Correspondences Between Panel Keys and Keyboard Operations (Cont'd)

Note:

The figure in Ctrl+Shift+"figure" cannot be entered by the numeric keypad.

Appendix I Scanning for Virus

For the MG3710A/MG3710E/MG3740A, we recommend not installing virus scanning software to ensure the best possible performance of the equipment. In some user operating environments, however, the MG3710A/MG3710E/MG3740A might not be completely protected from virus infection, and periodic virus scans might be required.

This chapter provides a procedure to use to check for viruses and the related cautions. The following shows an overview of the virus scanning procedure, in which the MG3710A/MG3710E/MG3740A drives are mounted (assigned) to network drives on an external PC, and then viruses are checked for using antivirus software installed in that computer:

I.1	For Wi	ndows Embedded Standard 2009I-3
	I.1.1	Connecting external PC to
		MG3710A/MG3740A I-3
	I.1.2	Checking IP address of MG3710A/MG3740A I-3
	I.1.3	Configuring shared settingsI-5
	I.1.4	Changing user account for
		MG3710A/MG3740A I-6
	l.1.5	Shared settings for MG3710A/MG3740A I-9
	I.1.6	Mounting MG3710A/MG3740A drives to
		external PC drivesI-11
	l.1.7	Scanning for virusI-12
	l.1.8	Dismounting MG3710A/MG3740A drives from
		external PC drives I-12
	l.1.9	Making MG3710A/MG3740A drives
		unsharedI-12
	I.1.10	Restoring previous user account setting for
		MG3710A/MG3740A I-12
	I.1.11	Enabling Simple File Sharing I-13
1.2	For Wi	ndows 7 Professional or Windows Embedded
	Standa	rd 7 I-14
	I.2.1	Connecting external PC to
		MG3710A/MG3710E/MG3740AI-14
	1.2.2	Checking IP address of
		MG3710A/MG3710E/MG3740AI-14
	1.2.3	Configuring shared settings I-16
	1.2.4	Changing user account for
		MG3710A/MG3710E/MG3740AI-18
	1.2.5	Shared settings for
		MG3710A/MG3710E/MG3740AI-21
	1.2.6	Mounting MG3710A/MG3710E/MG3740A
		drives to external PC drives I-23

1.2.7	Scanning for virus	. I-25
1.2.8	Dismounting MG3710A/MG3710E/MG3740A	
	drives from external PC drives	
1.2.9	Making MG3710A/MG3710E/MG3740A drive	s
	unshared	. I-25
I.2.10	Restoring previous user account setting for	
	MG3710A/MG3710E/MG3740A	. I-2 5
I.2.11	Enabling Sharing Settings	. I-2 6
For Wi	ndows 10	. I-27
I.3.1	Connecting External PC to	
	MG3710A/MG3710E/MG3740A	. I-2 7
1.3.2	Checking IP address of	
	MG3710A/MG3710E/MG3740A	. I-2 7
1.3.3	Configuring shared settings	. I-2 9
1.3.4	Changing user account for	
	MG3710A/MG3710E/MG3740A	. I- 31
1.3.5	Shared Settings for	
	MG3710A/MG3710E/MG3740A	. I- 35
I.3.6	Mounting MG3710A/MG3710E/MG3740A	
	drives to the external PC drives	. I-38
1.3.7	Scanning for virus	. I-4 0
1.3.8	Unmounting the equipment drives from	
	the external PC drives	. I-4 0
1.3.9	Making MG3710A/MG3710E/MG3740A drive	s
	unshared	. I-4 0
I.3.10	Restoring the previous user account setting for	or
	MG3710A/MG3710E/MG3740A	. I-4 0
I.3.11	Enabling Simple File Sharing	. I-4 1

Notes:

1.3

• Be sure to follow the procedure described in this document. If this procedure is not followed, not only will it not be possible to check for viruses, but the MG3710A/MG3710E/MG3740A might become unusable.

If the MG3710A/MG3710E/MG3740A runs abnormally after removing viruses, execute system recovery to restore all drives to the factory default settings. For the procedures, refer to 9.7.6 "System Recovery Functions".

After performing system recovery, the firmware might have to be upgraded to the latest version depending on when the MG3710A/MG3710E/MG3740A was released.

• Before using antivirus software, be sure to check its usage and the license scope.

I.1 For Windows Embedded Standard 2009

I.1.1 Connecting external PC to MG3710A/MG3740A

Connect MG3710A/MG3740A and the external PC with a LAN cable.

For details about how to set up the network for the MG3710A/MG3740A, refer to Appendix E "Remote Control".

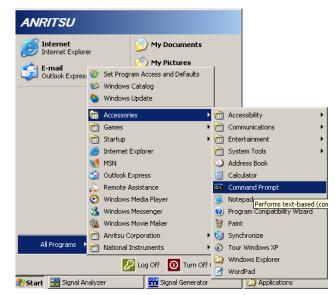
I.1.2 Checking IP address of MG3710A/MG3740A

If the IP address is automatically assigned upon establishing a DHCP connection, check the IP address by using the following procedure:

1. Display the MG3710A/MG3740A desktop.

To display the desktop, right-click anywhere on the screen and select **Show the Desktop**.

2. Display the MS-DOS Prompt. On the MG3710A/MG3740A, select Start – All Programs – Accessories – Command Prompt.



3. Enter the following:

ipconfig

The assigned IP address displays as shown.

🔤 Command Prompt
Microsoft Windows XP [Version 5.1.2600] (C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\ANRITSU>ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
Connection-exection DNC Cuffix
IP Address 192.168.0.1
Default Gateway 192.168.0.2
C:\Documents and Settings\ANRITSU>_

I.1.3 Configuring shared settings

Simple File Sharing is enabled for the MG3710A/MG3740A by default. If authentication is performed by way of a network while Simple File Sharing is enabled, the accessing user is regarded as having a Guest account and cannot access important folders and files such as the Windows folder. To avoid this, use the following procedure to temporarily disable Simple File Sharing:

- 1. On the MG3710A/MG3740A, click the **Start** button and then click **My Computer**.
- 2. In the Tool menu, click Folder Options, and click the View tab.
- 3. From the **Advanced Settings** list, make sure that the **Use simple file sharing (Recommended)** check box is NOT selected.

older Options			?
General View	File Types Offline Files	s	
Folder views			
	You can apply the view (s you are using for this folde		Tiles) that
	Apply to All Folders	Reset All F	
	Abbill to Mirt olders		oldors
Advanced setti	-		
	o not show hidden files ar		_
	how hidden files and folde		
	extensions for known file t protected operating syster		beboo
	ch folder windows in a sep		anded)
	ember each folder's view s		_
Resto	ore previous folder window	vs at logon	
Show	Control Panel in My Com	puter	
	encrypted or compressed		
	pop-up description for fol		items
	simple file sharing (Recomr	mended	-
1			
		Restor	e Defaults
		Hestor	
	OK	Cancel	Apply

4. Click **OK**.

I.1.4 Changing user account for MG3710A/MG3740A

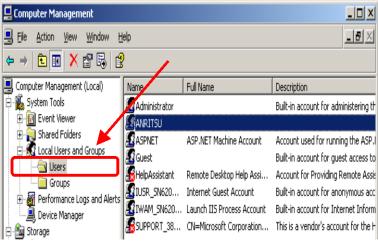
This section describes how to change the user account used when the MG3710A/MG3740A drives are mounted to network drives.

- 1. From the Start menu, select Control Panel.
- 2. Select Administrative Tools from the Control Panel.



3. In Administrative Tools, select Computer Management.

🐂 Administrative Tools				_	
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u>	ools <u>H</u>	elp			
🚱 Back 👻 🕥 🖌 🏂 🔎	Search	防 Fold	ers 🛛 💕	3	>>
Address 🦏 Administrative Tools				• •	Go
Name 🔺		Size	Туре		
Component Services		2 KB	Shortcut		
💂 Computer Management		2 KB	Shortcut		
🔂 Data Sources (ODBC)		2 KB	Shortcut		
🛃 Event Viewer		2 KB	Shortcut		
🔠 Internet Information Services		2 KB	Shortcut		
B Local Security Policy		2 KB	Shortcut		
📲 Microsoft .NET Framework 1		2 KB	Shortcut		
		7 V P	Chartent		► //



5. Right-click the user account **ANRITSU** to use, and select the **Set**

Password...menu.

💂 Computer Management			
	elp		<u>_8×</u>
)		
Computer Management (Local)	Name	Full Name	Description
E-System Tools	Administrator		Built-in account for administe
B I Event Viewer B I Coal Users and Groups B I Coal Users and Groups B I Performance Logs and Alerts Device Manager D Device Manager B I Storage B I Storage B I Disk Defragmenter	ANRITSU ASPNET HelpAssistant IUSR_SN6200723945 IWAM_SN6200723945	Set Password nt All Tasks isi Delete si Rename unt Properties in Help isi	Built-in account for anonymc Built-in account for Internet

6. When the message below is shown during the password setting, select **Proceed**.



4. In the Computer Management tree, select **Users** under **Local Users** and **Groups**.

<u>N</u> ew passv	vord:	
<u>C</u> onfirm pa	ssword:	
🔥 lf you	click OK, the following will occur:	
•	Your local user account will immediately lose access to all encrypted files, stored passwords, and personal security certificates.	of i
•	Any password reset disks you have created will no longer work.	
If you click	Cancel, the password will not be changed and no data loss	wil

7. Type "ANRITSU" for the password of the user account **ANRITSU**.

8. After setting the password, click **OK** in the dialog for confirmation.

I.1.5 Shared settings for MG3710A/MG3740A

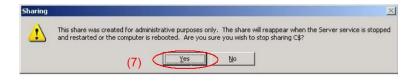
- 1. From the Start menu, select **My Computer**.
- 2. Right-click the C drive.
- 3. Select Sharing and Security.
- 4. Select the **Sharing** tab.

folder.	k. To enable sharing for this fold	
Share this		
S <u>h</u> are name:	C\$	-
<u>C</u> omment:	Default share	
User limit:	<u>Maximum allowed</u>	
	$\mathbb C$ Allow this number of users:	÷
	ions for users who access this network, click Permissions.	Permissions
To configure s Caching.	ettings for offline access, click	Caching
		N <u>e</u> w Share

- 5. To disable the default sharing setting, select **Do not share this** folder.
- 6. Click the **Apply** button.

inetwork folder.	an share this folder with other user k. To enable sharing for this folde	
Do not sha <u>Share this</u>	are this folder (5) folder	
Share name:	C\$	*
Comment:	Default share	
User limit:	€ Maximum allowed	
	${f C}$ Allo <u>w</u> this number of users:	
	ions for users who access this network, click Permissions.	Permissions
To configure s Caching.	ettings for offline access, click	Caching
		N <u>e</u> w Share
		(6)

7. A dialog appears. Select Yes.



- 8. Select Share this folder.
- 9. Click the **Permissions** button.

System Disk (C:) Properties
General Tools Hardware Sharing Security Quota
You can share this folder with other users on your network. To enable sharing for this folder, click Share this folder.
C Do not share this folder
Share this folder (8)
S <u>h</u> are name: C
<u>C</u> omment:
User limit:
C Allow this number of users:
To set permissions for users who access this folder over the network, click Permissions.
To configure settings for offline access, click <u>Caching</u>
Windows Firewall is configured to allow this folder to be shared with other computers on the network.
View your Windows Firewall settings
OK Cancel Apply

10. Select the **Allow** check box for **Full control**.

Permissions for C	<u>? ×</u>
Share Permissions	
Group or user names:	
🕵 Everyone	
	Add <u>R</u> emove
Permissions for Everyone	Allow Deny
Full Control	
Change Read	
OK	Cancel <u>A</u> pply

11. Click **OK** to close two dialogs displayed.

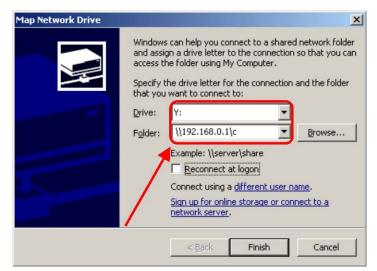
12. Repeat steps 3 to 11 to the D drive.

I.1.6 Mounting MG3710A/MG3740A drives to external PC drives

- 1. On the PC connected by way of the network (which is used to run the virus scanning software), mount (assign) all the shared drives of the MG3710A/MG3740A as network drives.
- 2. On the PC, right-click **My Network Places**, and select **Map Network Drive**.
- 3. Enter "The IP address of MG3710A/MG3740A + drive name" for the folder name.
- Example When the IP address of the MG3710A/MG3740A is 192.168.0.1:

To mount the C drive, specify Y for Drive and $\underline{\192.168.0.1c}$ for Folder.

To mount the D drive, specify Z for Drive and $\underline{\192.168.0.1\d}$ for Folder.



- 4. Click **Connect using a different user name**.
- 5. Enter "ANRITSU" for the User name, and also "ANRITSU" for the Password (as specified in Section I.1.4, Step 7).

Connect As	×	C
By default, you will their user name an	connect to the network folder as To connect as another user, enter d password below.	
<u>U</u> ser name:	ANRITSU	
Password:	•••••	
	OK Cancel	

6. Click **OK** – **Finish** to complete mounting the network drive.

7. Repeat steps 2 to 6 to the D drive.

I.1.7 Scanning for virus

Scan the network drives mounted on the external PC for viruses.

Even if network drives cannot be scanned using your software, scanning might be possible by dragging and dropping a network drive onto the virus software icon in Windows Explorer.

I.1.8 Dismounting MG3710A/MG3740A drives from external PC drives

Right-click **My Network Places** on the external PC, and select **Disconnect Network Drive**.

Dismount the two mapped drives.

I.1.9 Making MG3710A/MG3740A drives unshared

- 1. From the **Start** menu, select **My Computer**.
- 2. Right-click the C drive.
- 3. Select Sharing and Security.
- 4. Select the **Sharing** tab.
- 5. Select the **Do not share this folder** button.
- 6. Repeat steps 2 to 5 to the D drive.

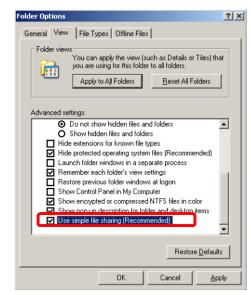
I.1.10 Restoring previous user account setting for MG3710A/MG3740A

The user account password has been changed in Section I.1.4 "Changing user account for the MG3710A/MG3740A" for mounting the MG3710A/MG3740A drives to network drives of the external PC. Restore the password before change in the same way as it was changed. Note that "anritsu" is specified by default.

I.1.11 Enabling Simple File Sharing

Simple File Sharing has been disabled in Section I.1.3 "Configuring shared settings" for sharing drives. To restore the original settings, enable Simple File Sharing by using the following procedure:

- On the MG3710A/MG3740A, click the Start button and then click My Computer.
- 2. In the **Tool** menu, click **Folder Options**, and click the **View** tab.
- 3. From the **Advanced Settings** list, make sure that the **Use simple file sharing (Recommended)** check box is selected.



4. Click **OK**.

I.2 For Windows 7 Professional or Windows Embedded Standard 7

I.2.1 Connecting external PC to MG3710A/MG3710E/MG3740A

Connect MG3710A/MG3710E/MG3740A and the external PC with a LAN cable.

For details about how to set up the network for the MG3710A/MG3710E/MG3740A, refer to Appendix E "Remote Control".

I.2.2 Checking IP address of MG3710A/MG3710E/MG3740A

If the IP address is automatically assigned upon establishing a DHCP connection, check the IP address by using the following procedure:

1. Display the MG3710A/MG3710E/MG3740A desktop.

To display the desktop, right-click anywhere on the screen and select **Show the Desktop**.

2. Display the MS-DOS Prompt. On the MG3710A/MG3710E/MG3740A, select Start – All Programs – Accessories – Command Prompt.

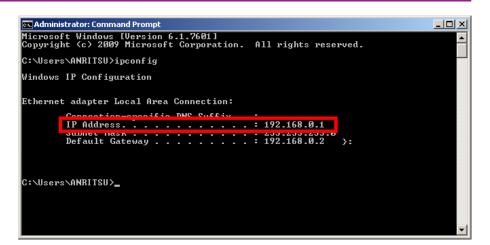


3. Enter the following:

ipconfig

The assigned IP address displays as shown.

I.2 For Windows 7 Professional or Windows Embedded Standard 7



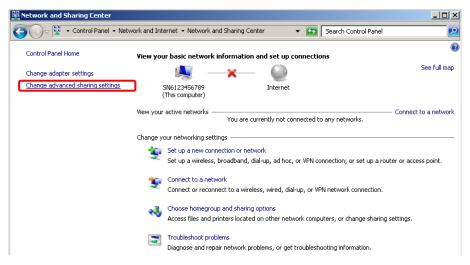
I.2.3 Configuring shared settings

Sharing Settings is enabled for the MG3710A/MG3710E/MG3740A by default. If authentication is performed by way of a network while Sharing Settings is enabled, the accessing user is regarded as having a Guest account and cannot access important folders and files such as the Windows folder. To avoid this, use the following procedure to temporarily disable Sharing Settings:

- 1. On the MG3710A/MG3710E/MG3740A, click the **Start** button and then click **Control Panel**.
- 2. From the Control Panel menu, click View network status and tasks.



3. From the **Network and sharing Center** menu, click **Change** advanced sharing settings.



I.2 For Windows 7 Professional or Windows Embedded Standard 7

4. In the Advanced sharing settings dialog box, click Turn off network discovery, Turn off file and printer sharing, and Turn on Password protected sharing.

Advanced sharing settings	
🕥 🕫 🔹 Network and Sharing Center 🔹 Advanced sharing settings 💿 🔹 🔯 Search Control Panel	
Change sharing options for different network profiles Windows creates a separate network profile for each network you use. You can choose specific options for each profile.	
Home or Work	
Public (current profile)	
Network discovery	
When network discovery is on, this computer can see other network computers and devices and is visible to other network computers. <u>What is network discovery?</u>	
C Turn on network discovery	
C Turn off network discovery	
File and printer sharing —	
When file and printer sharing is on, files and printers that you have shared from this computer can be accessed by people on the network.	
C Turn on file and printer sharing	
Turn off file and printer sharing	
Public folder sharing	
When Public folder sharing is on, people on the network, including homegroup members, can access files in the Public folders. What are the Public folders?	
m O Turn on sharing so anyone with network access can read and write files in the Public folders	
$oldsymbol{\Theta}$ Turn off Public folder sharing (people logged on to this computer can still access these folders)	
Media streaming ————————————————————————————————————	
When media streaming is on, people and devices on the network can access pictures, music, and videos on this computer. This computer can also find media on the network.	
Choose media streaming options	
File sharing connections	
Windows 7 uses 128-bit encryption to help protect file sharing connections. Some devices don't support 128- bit encryption and must use 40- or 56-bit encryption.	
 Use 128-bit encryption to help protect file sharing connections (recommended) 	
$\mathbb O$ Enable file sharing for devices that use 40- or 56-bit encryption	
Password protected sharing	
When password protected sharing is on, only people who have a user account and password on this computer can access shared files, printers attached to this computer, and the Public folders. To give other people access, you must turn off password protected sharing.	
O Turn on password protected sharing	
C Turn off password protected sharing	
Save changes Cancel	

5. Click Save changes.

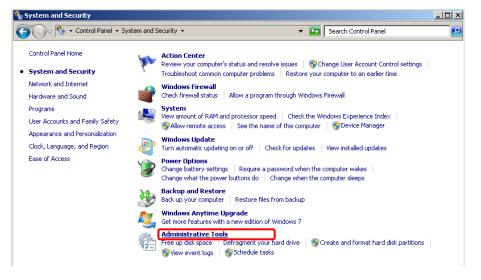
I.2.4 Changing user account for MG3710A/MG3710E/MG3740A

This section describes how to change the user account used when the MG3710A/MG3710E/MG3740A drives are mounted to network drives.

- 1. From the Start menu, select Control Panel.
- 2. From the Control Panel menu, click System and Security.



3. From the System and Security menu, click Administrative Tools.



I.2 For Windows 7 Professional or Windows Embedded Standard 7

Administrative Tools				_ 0
🕥 🗟 🔹 Control Par	nel 👻 System and Security 👻 Administrative Tools	- 🔯	Search Administrative T	ools
Organize 🔻				= - 🚺 📀
🔆 Favorites	Name ^	Date modified	Туре	Size
🧮 Desktop	Component Services	7/14/2009 1:46 PM	Shortcut	2 KB
Downloads	🗌 🛃 Computer Management	7/14/2009 1:41 PM	Shortcut	2 KB
🔛 Recent Places	📷 Data Sources (ODBC)	7/14/2009 1:41 PM	Shortcut	2 KB
📜 Libraries	🔝 Event Viewer	7/14/2009 1:42 PM	Shortcut	2 KB
Documents	矝 Internet Information Services (IIS) Manager	11/6/2011 10:36 AM	Shortcut	2 KB
🍶 Music	🔝 iSCSI Initiator	7/14/2009 1:41 PM	Shortcut	2 KB
E Pictures	🛃 Local Security Policy	11/6/2011 9:51 AM	Shortcut	2 KB
Videos	Performance Monitor	7/14/2009 1:41 PM	Shortcut	2 KB
💻 Computer	🕞 Print Management	11/6/2011 9:50 AM	Shortcut	2 KB
Windows (C:)	a Services	7/14/2009 1:41 PM	Shortcut	2 KB
System (D:)	🔂 System Configuration	7/14/2009 1:41 PM	Shortcut	2 KB
👝 Removable Disk (E:)	쥕 Task Scheduler	7/14/2009 1:42 PM	Shortcut	2 KB
	🔗 Windows Firewall with Advanced Security	7/14/2009 1:41 PM	Shortcut	2 KB
👊 Network	減 Windows Memory Diagnostic	7/14/2009 1:41 PM	Shortcut	2 KB
	😹 Windows PowerShell Modules	7/14/2009 1:52 PM	Shortcut	3 KB

4. From the Administrative Tools menu, select Computer Management.

5. In the Computer Management tree, select **Users** under **Local Users** and **Groups**.

🛃 Computer Management					
<u>File Action View H</u> elp					
🗢 🔿 🔰 🖬 🙆 😖					
E Computer Management (Local)	Name	Full Name [īΓ	Actions	
🖃 🎁 System Tools	Administrator	E	E	Users	A
🕀 🕑 Task Scheduler	💭 ANRITSU		I.		
🕀 🛃 Event Viewer	🚛 Guest	E	E	More Actions	•
			h	ANRITSU	
Local Users and Groups Local Users Groups			ľ	More Actions	۲
🛨 🚳 Performance			L		
🚔 Device Manager			L		
🖃 📇 Storage			L		
📄 Disk Management			L		
🗉 퉲 Services and Applications			d.		
			1)		

6. Right-click the user account **ANRITSU** to use, and select the **Set Password...**menu.

🛃 Computer Management					
File Action View Help					
🗢 🔿 🖄 🖬 🗶 📑 😖	?				
E Computer Management (Local)	Name	Full Name	[Action	15	
🖃 🎁 System Tools	Administrator		E Users		A
🕀 🕑 Task Scheduler	ANRITSU		Set Password	1	· · ·
Event Viewer	Guest		Set Password	Actions	•
			All Tasks 🔹 🕨	U	A
			Delete		
Groups			Rename	e Actions	•
				-	
🚔 Device Manager			Properties		
🖃 🔄 Storage			Help		
Disk Management				_	
🕀 🌆 Services and Applications	•		Þ		
Set the user's password.					

Appendix I Scanning for Virus

7. When the message below is shown, select **Proceed**.



8. Type "ANRITSU" for the password of the user account **ANRITSU**.

Set Password for ANRI	rsu	? ×
<u>N</u> ew password:	·····	
Confirm password:	·····	
🛕 If you click OK, the f	ollowing will occur:	
	ount will immediately lo ed passwords, and per	se access to all of its sonal security certificates.
If you click Cancel, the pa occur.	assword will not be ch	anged and no data loss will
	OK Can	cel

9. After setting the password, click **OK** in the dialog for confirmation.

I.2.5 Shared settings for MG3710A/MG3710E/MG3740A

- 1. From the Start menu, select **Computer**.
- 2. Right-click the C drive and select **Properties.**

📮 Computer	
Computer -	👻 🚱 Search Computer 😥
Organize Properties System properties Uninstall or change	a program Map network drive Open Control Panel 📰 👻 🗐 🔞
Favorites Favorites Copktop Open ope	System (0:) 86.2 MB free of 99.9 MB
Windows (C:) Space used: Local Disk Space free: 75.5 GB	Total size: 98.9 GB File system: NTFS

3. Select the **Sharing** tab and click the **Advanced Sharing...**button.

🐎 Windows (C:) Properties	X
Security Previous Versions Quota General Tools Hardware Sharing	
Network File and Folder Sharing C:\ Not Shared Network Path: Not Shared Share	
Advanced Sharing Set custom permissions, create multiple shares, and set other advanced sharing options.	
Password Protection	
People must have a user account and password for this computer to access shared folders.	
To change this setting, use the <u>Network and Sharing Center</u> .	
OK Cancel Apply	

✓ Share this folder Settings Share name: C Add Remove Limit the number of simultaneous users to: 20 Comments: Permissions Caching OK Cancel	Idvanced Sharing
Share name: C Add Remove Limit the number of simultaneous users to: 20 = Comments: Permissions Caching	Share this folder
C Add Remove Limit the number of simultaneous users to: 20 Comments: Permissions Caching	-
Add Remove Limit the number of simultaneous users to: 20 = Comments: Permissions Caching	
Limit the number of simultaneous users to: 20 Comments:	
Comments:	
	Comments:
OK Cancel Apply	
OK Cancel Apply	
	OK Cancel Apply

4. Select the **Share this folder** check box and click the **Permissions** button.

5. Make sure **Everyone** is selected, and select the **Allow** check boxes for **Full Control** and **Change**.

📜 Permissions for C	<u>×</u>
Share Permissions	
Group or user names:	
& Everyone	
	A <u>d</u> d <u>R</u> emove
Permissions for Everyone	Allow Deny
Full Control	
Change Bead	
incua i	
Learn about access control and	permissions
OK	Cancel <u>A</u> pply

- 6. Click **OK** to close two dialogs displayed.
- 7. Repeat steps 2 to 7 to the D drive.

I.2.6 Mounting MG3710A/MG3710E/MG3740A drives to external PC drives

- 1. On the PC connected by way of the network (which is used to run the virus scanning software), mount (assign) all the shared drives of the MG3710A/MG3710E/MG3740A as network drives.
- 2. On the PC, click **Start** and then click **Computer**.
- 3. From the Computer menu, select Map Network Drive.

Computer					_	
Computer	•	▼ 60	Search Computer			2
Organize 🔻 System prope	erties Uninstall or change a program	Map network drive Open Control Panel		€ = ₩ =	•	•
★ Favorites Desktop Downloads Some Places	Hard Disk Drives (2) Windows (C:) T5.5 GB free of 98.9 GB Devices with Removable Storage (1)	Creates a shortcut to a shared computer on a network. System (U:) 86.2 MB free of				
ibraries ⊇ Documents ↓ Music ⊇ Pictures ₩ Videos	Removable Disk (E:)					
Computer						

4. Enter "The IP address of MG3710A/MG3710E/MG3740A + drive name" for the folder name.

Example When the IP address of the

MG3710A/MG3710E/MG3740A is 192.168.0.1:

To mount the C drive, specify Y for Drive and $\underline{\192.168.0.1\c}$ for Folder.

To mount the D drive, specify Z for Drive and $\underline{\192.168.0.1\d}$ for Folder.

🐔 Map Network	c Drive	×
🕜 🤏 Map N	Network Drive	
What net	work folder would you like to map?	
Specify th	e drive letter for the connection and the folder that you want to connect to:	
Drive:	Y:	
F <u>o</u> lder:	\\192.168.0.1\c Browse	
	Example: \\server\share	
	Reconnect at logon	
	Connect using different credentials	
	Connect to a Web site that you can use to store your documents and pictures.	
	Einish Cancel	

5. Select the **Connect using different credentials (C)** check box.

Appendix I Scanning for Virus

6. Enter "ANRITSU" for the User name, and also "ANRITSU" for the Password (as specified in Section I.2.4, Step 7).

Jser name	
Password Domain: SN6123456789	

- 7. Click **OK Finish** to complete mounting the network drive.
- 8. Repeat steps 2 to 7 to the D drive.

I.2.7 Scanning for virus

Scan the network drives mounted on the external PC for viruses.

Even if network drives cannot be scanned using your software, scanning might be possible by dragging and dropping a network drive onto the virus software icon in Windows Explorer.

I.2.8 Dismounting MG3710A/MG3710E/MG3740A drives from external PC drives

- 1. On the PC, click **Start**. From the Start menu, right-click **Computer**.
- 2. Click **Disconnect Net Drive**.
- 3. Select the network drive to dismount, and then click **OK**.

Dismount the two mapped drives.

I.2.9 Making MG3710A/MG3710E/MG3740A drives unshared

- 1. From the **Start** menu, select **Computer**.
- 2. Right-click the C drive.
- 3. Select the **Sharing** tab.
- 4. Click the **Advanced Sharing...**button.
- 5. Deselect the **Share this folder** check box.
- 6. Repeat steps 2 to 5 to the D drive.

I.2.10 Restoring previous user account setting for MG3710A/MG3710E/MG3740A

The user account password has been changed in Section I.2.4 "Changing user account for the MG3710A/MG3710E/MG3740A" for mounting the MG3710A/MG3710E/MG3740A drives to network drives of the external PC. Restore the password before change in the same way as it was changed. Note that "anritsu" is specified by default.

I.2.11 Enabling Sharing Settings

Sharing Settings has been disabled in Section I.2.3 "Configuring shared settings" for sharing drives. To restore the original settings, enable Sharing Settings by using the following procedure:

- 1. On the MG3710A/MG3710E/MG3740A, click the **Start** button and then click **Control Panel**.
- 2. From the Control Panel menu, click View network status and tasks.
- 3. From the Network and sharing Center menu, click Change advanced sharing settings.
- 4. In the Advanced sharing settings dialog box, click Turn on network discovery, Turn on file and printer sharing, and Turn off Password protected sharing.
- 5. Click Save changes.

I.3 For Windows 10

I.3.1 Connecting External PC to MG3710A/MG3710E/MG3740A

Connect MG3710A/MG3710E/MG3740A and the external PC with LAN cable.

For details about how to set up the network for the MG3710A/MG3710E/MG3740A, refer to Appendix E "Remote Control".

I.3.2 Checking IP address of MG3710A/MG3710E/MG3740A

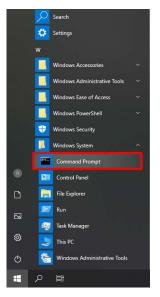
If the IP address is automatically assigned upon establishing a DHCP connection, check the IP address by using the following procedure:

1. Display the MG3710A/MG3710E/MG3740A Windows desktop.

To display the Windows desktop, right-click anywhere on the screen and select **Show the Desktop**.

2. Display the MS-DOS Prompt. On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar.

Click the **Start** icon to open the Start menu, and then click **Windows System > Command Prompt** in the **W** column of the app list displayed.



3. Enter the following:

ipconfig

The assigned IP address displays as shown.

Command Prompt						
Microsoft Windows [Version 10.0.17763.316] (c) 2018 Microsoft Corporation. All rights reserved.						
C:\Users\ANRITSU> <mark>ipconfig</mark>						
Windows IP Configuration						
Ethernet adapter Local Area Connection:						
Connection-specific DNS Suffix .:						
Link-local IPv6 Address : fe80::5d34:cfd6:e136:c22%12						
IPv4 Address 192.168.20.3						
Subnet Mask						
Default Gateway :						

I.3.3 Configuring shared settings

Simple File Sharing is enabled for the MG3710A/MG3710E/MG3740A by default. If authentication is performed by way of a network while Simple File Sharing is enabled, the accessing user is regarded as having a Guest account and cannot access important folders and files such as the Windows folder. To avoid this, use the following procedure to temporarily disable Simple File Sharing.

1. On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar.

Right click the **Start [**] icon, and then click **File Explorer**.



2. In File Explorer window, click View tab and then click Options.

🀂 📝 📙 🖛 File Explore	er					-	\times
File Home Share	View (2)						🕐
Navigation Details pane	Extra large icons Large icons Small icons List F Tiles Content	tu Medium icons a Details ↓	Image: Group by ▼ Image: Group by ▼ <	 Item check boxes File name extensions Hidden items 	Hide selected items	(2)	
Panes	Layout		Current view	Show/hide			
 OneDrive This PC 	This PC	This PC		nis PC	This PC		
💣 Network							

3. In Folder Options dialog box, click View tab.

Advanced Settings list, turn off Use Sharing Wizard (Recommended) check box.

Folder Options (3))
General View Search	
Folder views You can apply this view (such as Details or Icons) to all folders of this type. Apply to Folders Reset Folders	
Advanced settings:	_
 Show drive letters Show encrypted or compressed NTFS files in color Show pop-up description for folder and desktop items Show preview handlers in preview pane Show status bar Show status bar Show status bar Show status bar Show status corported rotifications Use check boxes to select items 	
Use Sharing Wizard (Recommended) (3) When typing into list view	
 Automatically type into the Search Box Select the typed item in the view Navigation pane 	,
Restore Defaults	
(4) OK Cancel Appl	y

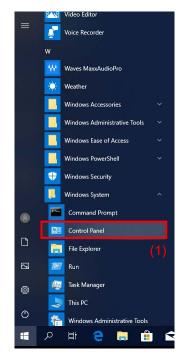
4. Click **OK**.

I.3.4 Changing user account for MG3710A/MG3710E/MG3740A

This section describes how to change the user account used when the MG3710A/MG3710E/MG3740A drives are mounted to network drives.

1. On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar.

Click the **Start** icon to open the Start menu, and then click **Windows System > Control Panel** in the **W** column of the app list displayed.



2. Click Administrative Tools from the Control Panel.



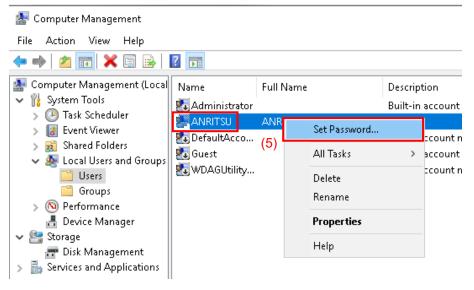
Ël 📝 🛄 ╤ I	Share	Manage Administrative	Tools	-	×
					Search Ad 🔎
	^	Name	Date modified	Туре	Size
📌 Quick access		🔊 Component Services (3)	9/15/2018 4:29 PM	Shortcut	2 KI
E Desktop	*	🎥 Computer Management	9/15/2018 4:29 PM	Shortcut	2 KI
🕂 Downloads	*	ڬ Defragment and Optimize Drives	9/15/2018 4:29 PM	Shortcut	2 KI
🔮 Documents	*	🔚 Disk Cleanup	9/15/2018 4:29 PM	Shortcut	2 KI
📰 Pictures	*	冠 Event Viewer	9/15/2018 4:29 PM	Shortcut	2 KI
dspComError	Repro	💦 Internet Information Services (IIS) Manag	jer 9/15/2018 4:29 PM	Shortcut	2 KI
MS269xA		👧 iSCSI Initiator	9/15/2018 4:29 PM	Shortcut	2 KI
network		📠 Local Security Policy	9/15/2018 4:29 PM	Shortcut	2 KI

3. Click **Computer Management** in the Administrative Tools window.

4. In Computer Management tree, click **Users** under **Local Users and Groups**.

🌆 Computer Management			
File Action View Help			
🗢 🄿 🗖 📰 🗙 🗟 🗟	? 🗊		
 Computer Management (Local [*] System Tools [*] (2) Task Scheduler 	Name Raministrator ANRITSU	Full Name ANRITSU	Description Built-in account for
 Event Viewer Shared Folders Local Users and Groups Users (4) Groups OPerformance Device Manager Storage Tosk Management Services and Applications 	DefaultAcco Guest		A user account mai Built-in account foi A user account mai

5. Right click the user account **ANRITSU** to use, and click **Set Password...**



6. When the message below is shown, click **Proceed**.

Set Pas:	sword for ANRITSU X			
	You are logged in as "ANRITSU". You have chosen to reset the password for your local user account.			
	Resetting this password might cause irreversible loss of information. For security reasons, Windows protects certain information by making it impossible to access if the password is reset.			
	This data loss will occur the next time you log off.			
	You should use this command only if you've forgotten the password and do not have a password reset disk. If you know the current password and want to change it, press CTRL+ALT+DELETE and click Change Password.			
	For additional information, click Help.			
	(6) Proceed Cancel Help			

Appendix I Scanning for Virus

7. Type "anritsu" for the password of the user account **ANRITSU**.

Set Password for ANRITSU	?	\times
New password: (7)		
Confirm password:		
⚠️ If you click OK, the following will occur:		
Your local user account will immediately lose access t encrypted files, stored passwords, and personal secur		
If you click Cancel, the password will not be changed and occur.	no data lo	oss will
(8) OK Cancel		

8. Confirm and click **OK**.

I.3.5 Shared Settings for MG3710A/MG3710E/MG3740A

- On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar. Right click the Start icon, and then click File Explorer > This PC.
- 2. Right-click the C drive.
- 3. Click **Properties**.
- 4. Click the **Sharing** tab.

	•		
Security	Previous Version		Customize
General	Tools	Hardware	Sharing
C:\	t Shared	1	(4)
Share Advanced Sharing Set custom permissions, create multiple shares, and set other advanced sharing options. (5)			
	otection		
computer to	have a user accou access shared fold his setting, use the	lers.	

5. Click Advanced Sharing...

6. Turn off **Share this folder** check box to disable currently enabled folder sharing setting.

Advanced Sharing	×
Share this folder (6)	
Settings	
Share name:	
C	
Add Remove	
Limit the number of simultaneous users to:	
Comments:	
Permissions Caching	
(7) OK Cancel Apply	

- 7. Click **OK**.
- 8. Sharing dialog box appears. Click Yes.



- 9. Turn on **Share this folder** check box.
- 10. Click **Permissions**.

Advanced Sharing X
Share this folder (9)
Settings
Share name:
C
Add Remove
Limit the number of simultaneous users to: 20
Comments:
(10)
Permissions Caching
OK Cancel Apply

📕 Permissions for C		×
Share Permissions		
Group or user names:		
🎎 Everyone		
	Add	Remove
Permissions for Everyone	Allow	Deny
Full Control	(11) 🔽	
Change	\square	
Read	\checkmark	
	_	
(12) ок	Cancel	Apply

11. Turn on Allow check box of Full Control.

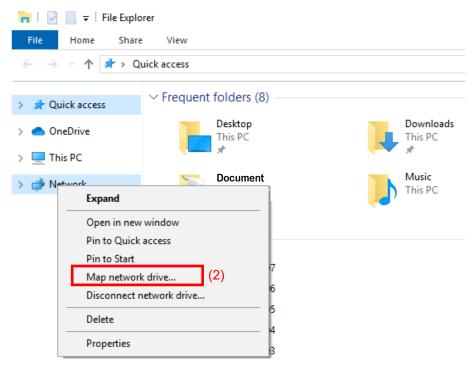
- 12. Click **OK** to close the two dialog boxes respectively.
- 13. Repeat steps 3 to 12 to the D drive.

Appendix I Scanning for Virus

I.3.6 Mounting MG3710A/MG3710E/MG3740A drives to the external PC drives

On the PC connected by way of the network (which is used to run the anti-virus software), mount (assign) all the shared drives of the MG3710A/MG3710E/MG3740A as network drives.

- Right click Start icon of the Windows taskbar on the external PC and then click File Explorer.
- 2. Right click **Network** on the Navigation window and click **Map network drive...**



- 3. Enter "The IP address of MG3710A/MG3710E/MG3740A + drive name" for the folder name.
- Example When the IP address of the MG3710A/MG3710E/MG3740A is 192.168.20.3:

To mount the C drive, specify Y for Drive and $\underline{192.168.20.3c}$ for Folder.

To mount the D drive, specify Z for Drive and $\underline{\192.168.20.3\d}$ for Folder.

🍕 Map N	etwork Drive	
What ne	twork folder would you like to map?	
Specify the	drive letter for the connection and the folder that you want to co	nnect to:
Drive:	Y: ~ (3)	
Folder:	\\192.168.20.3\c V	rowse
	Example: \\server\share	
	Reconnect at sign-in	
(4	Connect using different credentials	
	Connect to a Web site that you can use to store your documer	its and pictures.
	(5)	Finish

- 4. Turn on **Connect using different credentials** check box.
- 5. Click **Finish.**
- 6. Enter "ANRITSU" for the User name, and also "anritsu" for the Password (as specified in I.3.4, Step 7).

Windows Security	×
Enter network credentia	als
Enter your credentials to connect	to: 192.168.20.3
ANRITSU	(6)
•••••	ି
Domain:	
Remember my credentials	
(7)	
ОК	Cancel

- 7. Click **OK** > **Finish** to complete.
- 8. Repeat steps 2 to 7 to the D drive.

Appendix I Scanning for Virus

I.3.7 Scanning for virus

Scan the network drives mounted on the external PC for viruses.

I.3.8 Unmounting the equipment drives from the external PC drives

- 1. Right click **Start [**] icon of the Windows taskbar on the external PC and then click **File Explorer**.
- 2. Right click **Network** on the Navigation window and click **Disconnect network drive**.
- 3. Unmount the two mapped drives.

I.3.9 Making MG3710A/MG3710E/MG3740A drives unshared

- On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar. Right click the Start icon, and then click File Explorer > This PC.
- 2. Right-click the C drive.
- 3. Click **Properties**.
- 4. Click **Sharing** tab.
- 5. Click Advanced Sharing
- 6. Turn off **Share this folder** check box.
- 7. Click OK.
- 8. Sharing dialog box appears. Click Yes.
- 9. Repeat steps 3 to 8 to the D drive.

I.3.10 Restoring the previous user account setting for MG3710A/MG3710E/MG3740A

The user account password has been changed in Section I.3.4 "Changing user account for the MG3710A/MG3710E/MG3740A" for mounting the equipment drives to network drives of the external PC. Restore the password before change in the same way as it was changed. Note that the password "ANRITSU" is specified by default.

I.3.11 Enabling Simple File Sharing

Simple File Sharing has been disabled in Section I.3.3 "Configuring shared settings" for sharing drives. To restore the original settings, enable Simple File Sharing by using the following procedure:

- On the MG3710A/MG3710E/MG3740A Windows desktop, move the mouse pointer to the bottom of the screen to display the Windows taskbar. Right click the Start icon, and then click File Explorer.
- 2. In File Explorer window, click View tab and then click Options.
- 3. In **Folder Options** dialog box, click **View** tab.

From the Advanced Settings list, Turn on Use Sharing Wizard (Recommended) check box.

Folder Options (3)	×
General View Search	
Folder views You can apply this view (such as Details or Icons) to all folders of this type.	
Apply to Folders Reset Folders	
Advanced settings:	
 Show drive letters Show encrypted or compressed NTFS files in color Show pop-up description for folder and desktop items Show status bar Show status bar Show sync provider notifications Use check hoxes to select items Use chaining Wizard (Recommended)) When typing into list view Automatically type into the Search Box Select the typed item in the view Navigation pane 	
Restore <u>D</u> efaults	
(4) OK Cancel Apply	

4. Click **OK**.

Appendix J MG3641A/42A Compatible Command

This appendix describes SCPI commands for signal generators supported by the MG3710A/MG3710E/MG3740A (hereafter "MG3710A/10E/40A").

Supported signal generators

Anritsu MG3641A/MG3642A

J.1	Basic	Function Commands J-2
	J.1.1	Frequency Setting J-2
	J.1.2	Output SettingJ-4
	J.1.3	Sweep FunctionJ-6
	J.1.4	Amplitude Modulation J-8
	J.1.5	Frequency Modulation J-9
	J.1.6	Phase Modulation J-10
	J.1.7	Modulation Signal Source J-11
	J.1.8	Memory Setting J-13
J.2	Syster	n Commands J-14
	J.2.1	Display Subsystem J-14
	J.2.2	SCPI Commands J-15
	J.2.3	IEEE 488.2 Common Commands J-16

J.1 Basic Function Commands

J.1.1 Frequency Setting

Frequency setting device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.1-1.

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:FREQuency[:CW] <freq></freq>	[:SOURce[1] 2]:FREQuency[:CW :FIXe d] <freq></freq>	Same as the compatible command
:FREQuency[:CW]?	[:SOURce[1] 2]:FREQuency[:CW :FIXe d]?	Same as the compatible command
:FREQuency[:CW]:STEP[:INCRement] <freq></freq>	[:SOURce[1] 2]:FREQuency:STEP[:INC Rement] <freq></freq>	Same as the compatible command
:FREQuency[:CW]:STEP[:INCRement]?	[:SOURce[1] 2]:FREQuency:STEP[:INC Rement] <freq></freq>	Same as the compatible command
:FREQuency:RELative <boolean></boolean>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:REFerenc e:STATe <boolean></boolean>
:FREQuency:RELative?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:REFerenc e:STATe?
:FREQuency:OFFSet	[:SOURce[1] 2]:FREQuency:OFFSet <freq></freq>	Same as the compatible command
:FREQuency:OFFSet?	[:SOURce[1] 2]:FREQuency:OFFSet?	Same as the compatible command
:FREQuency:SWEep RUN STOP PAUSE CONT	MG3641A/MG3642A Commands can be used.	:INITiate[:IMMediate][:ALL] Available only for a function corresponding to RUN.
:FREQuency:SWEep:STARt <freq></freq>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:STARt <freq></freq>
:FREQuency:SWEep:STARt?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:STARt?

Table J.1.1-1 Frequency Setting Device Messages

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:FREQuency:SWEep:STOP <freq></freq>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:STOP <freq></freq>
:FREQuency:SWEep:STOP?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:STOP?
:FREQuency:SWEep:CENTer <freq></freq>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:CENTer <freq></freq>
:FREQuency:SWEep:CENTer?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:CENTer?
:FREQuency:SWEep:SPAN <freq></freq>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:SPAN <freq></freq>
:FREQuency:SWEep:SPAN?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:FREQuency:SPAN?
:FREQuency:SWEep:STEP:SIZE	Not supported.	
:FREQuency:SWEep:STEP:SIZE?	Not supported.	
:FREQuency:SWEep:STEP:NUMBer	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:SWEep:POINts Refer to the same parameter in frequency and level.
:FREQuency:SWEep:STEP:NUMBer?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:SWEep:POINts? Refer to the same parameter in frequency and level.
:FREQuency:SWEep:MODE AUTO SINGLE MANUAL	MG3641A/MG3642A Commands can be used.	[:SOURce]:LIST:MODE AUTO MANual Refer to the same parameter in frequency and level.
:FREQuency:SWEep:MODE?	MG3641A/MG3642A Commands can be used.	[:SOURCE]:LIST:MODE? Refer to the same parameter in frequency and level.
:FREQuency:SWEep:TIME	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:SWEep:DWELL Refer to the same parameter in frequency and level.

Table J.1.1-1 Frequency Setting Device Messages (Cont'd)

J-3

J.1.2 Output Setting

Output setting device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.2-1.

Table J.1.2-1	Output Setting Device Messages
---------------	--------------------------------

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
	MG3641A/MG3642A Commands can be	[:SOURce[1] 2]:SWEep:DWEL1?
:FREQuency:SWEep:TIME?	used.	Refer to the same parameter in frequency and level.
:FREQuency:SWEep:MARKer	Not supported.	
:FREQuency:SWEep:MARKer?	Not supported.	
:FREQuency:SWEep:PATTern SIZE NO LOG	Not supported.	
:FREQuency:SWEep:PATTern?	Not supported.	
:FREQuency:SWEep:TYPE 0 1	Not supported.	
:FREQuency:SWEep:TYPE?	Not supported.	
:AMPLitude[:OUT]:LEVel	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate][:AMPLitude]
:AMPLitude[:OUT]:LEVel?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate][:AMPLitude]?
:AMPLitude[:OUT]:LEVel:STEP[:INCRe ment]	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate]:STEP[:INCRement]
:AMPLitude[:OUT]:LEVel:STEP[:INCRe ment]?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate]:STEP[:INCRement]?
:AMPLitude[:OUT]:UNIT	Not supported.	
:AMPLitude[:OUT]:UNIT?	Not supported.	

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks	
:AMPLitude[:OUT]:STATe <boolean></boolean>	MG3641A/MG3642A Commands can be used.	:OUTPut[1] 2[:STATe] <boolean></boolean>	
:AMPLitude[:OUT]:STATe?	MG3641A/MG3642A Commands can be used.	:OUTPut[1] 2[:STATe]?	
:AMPLitude[:OUT]:CONTinuous	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:ATTenuation: AUTO	
:AMPLitude[:OUT]:CONTinuous?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:ATTenuation: AUTO?	
:AMPLitude[:OUT]:SAFety	Not supported.		
:AMPLitude[:OUT]:SAFety?	Not supported.		
:AMPLitude[:OUT]:VOLT EMF TERM	MG3641A/MG3642A Commands can be used.	:UNIT[1] 2:POWer DBM DBUV DBUVEMF	
:AMPLitude[:OUT]:VOLT?	MG3641A/MG3642A Commands can be used.	:UNIT[1] 2:POWer?	
:AMPLitude[:OUT]:RELative <boolean></boolean>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:REFerence:ST ATe <boolean></boolean>	
:AMPLitude[:OUT]:RELative?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:REFerence:ST ATe?	
:AMPLitude[:OUT]:OFFSet <rel_ampl></rel_ampl>	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate]:OFFSet <rel_ampl></rel_ampl>	
:AMPLitude[:OUT]:OFFSet?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer[:LEVel][:IMM ediate]:OFFSet?	
:AMPLitude[:OUT]:ISOLation <boolean></boolean>	Not supported.		
:AMPLitude[:OUT]:ISOLation?	Not supported.		
:AMPLitude[:OUT]:RPPReset	MG3641A/MG3642A Commands can be used.	:OUTPut:PROTection:RESume	

J.1

Basic Function Commands

J.1.3 Sweep Function

Sweep function device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.3-1.

Table J.1.3-1 Sweep Function Device Messages

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:AMPLitude[:OUT]:SWEep RUN STOP PAUSE CONT	MG3641A/MG3642A Commands can be used.	:INITiate[:IMMediate][:ALL] Available only for a function corresponding to RUN.
:AMPLitude[:OUT]:SWEep:STARt	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:STARt <ampl></ampl>
:AMPLitude[:OUT]:SWEep:STARt?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:STARt?
:AMPLitude[:OUT]:SWEep:STOP	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:STOP <ampl></ampl>
:AMPLitude[:OUT]:SWEep:STOP?	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:POWer:STOP?
:AMPLitude[:OUT]:SWEep:CENTer	Not supported.	
:AMPLitude[:OUT]:SWEep:CENTer?	Not supported.	
:AMPLitude[:OUT]:SWEep:SPAN	Not supported.	
:AMPLitude[:OUT]:SWEep:SPAN?	Not supported.	
:AMPLitude[:OUT]:SWEep:STEP:SIZE	Not supported.	
:AMPLitude[:OUT]:SWEep:STEP:SIZE?	Not supported.	

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks	
	MG3641A/MG3642A Commands can be	[:SOURce[1] 2]:SWEep:POINts	
:AMPLitude[:OUT]:SWEep:STEP:NUMBer	used.	Refer to the same parameter in frequency and level.	
:AMPLitude[:OUT]:SWEep:STEP:NUMBer	MG3641A/MG3642A Commands can be	[:SOURce[1] 2]:SWEep:POINts?	
?	used.	Refer to the same parameter in frequency and level.	
:AMPLitude[:OUT]:SWEep:MODE	MG3641A/MG3642A Commands can be	[:SOURce]:LIST:MODE AUTO MANual	
AUTO SINGLE MANUAL	used.	Refer to the same parameter in frequency and level.	
:AMPLitude[:OUT]:SWEep:MODE?	MG3641A/MG3642A Commands can be used.	[:SOURce]:LIST:MODE?	
		Refer to the same parameter in frequency and level.	
:AMPLitude[:OUT]:SWEep:TIME	MG3641A/MG3642A Commands can be used.	[:SOURce[1] 2]:SWEep:DWEL1	
		Refer to the same parameter in frequency and level.	
	MG3641A/MG3642A Commands can be	[:SOURce[1] 2]:SWEep:DWEL1?	
:AMPLitude[:OUT]:SWEep:TIME?	used.	Refer to the same parameter in frequency and level.	
:AMPLitude[:OUT]:SWEep:MARKer <rel_ampl></rel_ampl>	Not supported.		
:AMPLitude[:OUT]:SWEep:MARKer?	Not supported.		
:AMPLitude[:OUT]:SWEep:PATTern SIZE NO	Not supported.		
:AMPLitude[:OUT]:SWEep:PATTern?	Not supported.		
:AMPLitude[:OUT]:SWEep:TYPE 0 1	Not supported.		
:AMPLitude[:OUT]:SWEep:TYPE?	Not supported.		

Tabla I 1 2 1	Sweep Function	Dovice	Magagaa	(Cant'd)
1 abie J. 1.3-1	Sweep Function	Device	wessaues i	

J-7

J.1.4 Amplitude Modulation

Amplitude modulation device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.4-1.

	-	-
MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:AM[:DEPTh] <percent></percent>	[:SOURce[1] 2]:AM[1] 2[:DEPTh][:LI Near] <percent></percent>	Same as the compatible command
:AM[:DEPTh]?	[:SOURce[1] 2]:AM[1] 2[:DEPTh][:LI Near]?	Same as the compatible command
:AM:STATe <boolean></boolean>	[:SOURce[1] 2]:AM[1] 2:STATe <boolean></boolean>	Same as the compatible command
:AM:STATe?	[:SOURce[1] 2]:AM[1] 2:STATe?	Same as the compatible command
:AM:SOURce INT1 INT2 INT3 EXT1 EXT2	MG3641A/MG3642A Commands can be used. (Numeric characters will be ignored.)	
:AM:SOURce?	MG3641A/MG3642A Commands can be used.	

Table J.1.4-1 Amplitude Modulation Device Messages

J.1.5 Frequency Modulation

 $Frequency\ modulation\ device\ messages\ available\ in\ MG3710A/MG3710E/MG3740A\ are\ shown\ in\ Table\ J.1.5\ 1.$

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks	
:FM[:FM1][:DEViation] <freq></freq>	[:SOURce[1] 2]:FM[1] 2[:DEViation] <freq></freq>	Same as the compatible command	
:FM[:FM1][:DEViation]?	[:SOURce[1] 2]:FM[1] 2[:DEViation] ?	Same as the compatible command	
:FM[:FM1]:STATe	[:SOURce[1] 2]:FM[1] 2:STATe <boolean></boolean>	Same as the compatible command	
:FM[:FM1]:STATe?	[:SOURce[1] 2]:FM[1] 2:STATe?	Same as the compatible command	
:FM[:FM1]:SOURCE INT1 INT2 INT3 EXT1 EXT2	MG3641A/MG3642A Commands can be used. (Numeric characters will be ignored.)		
:FM[:FM1]:SOURce?	MG3641A/MG3642A Commands can be used.		
:FM:FM2[:DEViation] <freq></freq>	Not supported.		
:FM:FM2[:DEViation]?	Not supported.		
:FM:FM2:STATe	Not supported.		
:FM:FM2:STATe?	Not supported.		
:FM:FM2:SOURce INT1 INT2 INT3 EXT1 EXT2	Not supported.		
:FM:FM2:SOURce?	Not supported.		

Table J.1.5-1 Frequency Modulation Device Messages

J.1.6 Phase Modulation

J-10

Phase modulation device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.6-1.

Table J.1.6-1	Phase Modulation Device Messages	
---------------	----------------------------------	--

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:PM:STATe <boolean></boolean>	[:SOURce[1] 2]:PM:STATe <boolean></boolean>	[:SOURce[1] 2]:PULM:STATe <boolean></boolean>
:PM:STATe?	[:SOURce[1] 2]:PM:STATe?	[:SOURce[1] 2]:PULM:STATe?
:PM:IMPedance HIGH LOW	Not supported.	
:PM:IMPedance?	Not supported.	

J.1.7 Modulation Signal Source

Modulation signal source device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.7-1.

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:LFSource:FREQuency 0 1 400HZ 1kHz	[:SOURce[1] 2]:LFSource:FREQuency <freg></freg>	[:SOURce[1] 2]:FM[1]:INTernal:FRE Quency <freq></freq>
	<pre><rred></rred></pre>	Cannot change to 400Hz 1kHz by 0 1.
:LFSource:FREQuency?	[:SOURce[1] 2]:LFSource:FREQuency?	[:SOURce[1] 2]:FM[1]:INTernal:FRE Quency?
:LFSource:FREQuency2 <freq></freq>	[:SOURce[1] 2]:LFSource:FREQuency2 <freq></freq>	[:SOURce[1] 2]:FM2:INTernal:FREQu ency <freq></freq>
:LFSource:FREQuency2?	[:SOURce[1] 2]:LFSource:FREQuency2 ?	[:SOURce[1] 2]:FM2:INTernal:FREQu ency?
:LFSource:WAVeform2 SIN TRI SAW SQR	[:SOURce[1] 2]:LFSource:WAVeform2 SIN TRI SAW SQR	[:SOURce[1] 2]:FM[1] 2:INTernal:F UNCtion:SHAPe SINE TRIangle SQUare RAMP
:LFSource:WAVeform2?	[:SOURce[1] 2]:LFSource:WAVeform2?	[:SOURce[1] 2]:FM[1] 2:INTernal:F UNCtion:SHAPe?
:LFSource:FREQuency3 <freq></freq>	Not supported.	
:LFSource:FREQuency3?	Not supported.	
:LFSource:WAVeform3 SIN TRI SAW SQR	Not supported.	
:LFSource:WAVeform3?	Not supported.	
:LFSource:EXTernel:COUPling AC DC	[:SOURce[1] 2]::LFSource:EXTernel: COUPling AC DC	[:SOURce[1] 2]:EXTMod:COUPling DC AC
:LFSource:EXTernel:COUPling?	[:SOURce[1] 2]:LFSource:EXTernel:C OUPling?	[:SOURce[1] 2]:EXTMod:COUPling?

Table J.1.7-1 Modulation Signal Source Device Messages

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:LFSource:EXTernel2:COUPling AC DC	Not supported.	
:LFSource:EXTernel2:COUPling?	Not supported.	
:LFSource:OUTPut:LEVel	Not supported.	
:LFSource:OUTPut:LEVel?	Not supported.	
:LFSource:OUTPut:SOURce INT1 INT2 INT3 EXT1 EXT2 OFF	Not supported.	
:LFSource:OUTPut:SOURce?	Not supported.	

J.1.8 Memory Setting

Memory Setting device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.1.8-1.

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:MEMory:RECall <ext_numeric></ext_numeric>	Not supported.	:MMEMory:LOAD:STATe <string>[,<device>]</device></string>
:MEMory:RECall:TYPE 0 1 2	Not supported.	
:MEMory:STORe <numeric></numeric>	Not supported.	:MMEMory:STORe:STATe [<string>[,<device>]]</device></string>
:MEMory:SKIP	Not supported.	
:MEMory:CLEar	Not supported.	:MMEMory:DELete:STATe <filename>,<device></device></filename>
:MEMory:SWEep RUN STOP PAUSE CONT	Not supported.	
:MEMory:SWEep:SATRt	Not supported.	
:MEMory:SWEep:STARt?	Not supported.	
:MEMory:SWEep:STOP	Not supported.	
:MEMory:SWEep:STOP?	Not supported.	
:MEMory:SWEep:MODE AUTO SINGLE MANUAL	Not supported.	
:MEMory:SWEep:MODE?	Not supported.	
:MEMory:SWEep:TIME	Not supported.	
:MEMory:SWEep:TIME?	Not supported.	
:MEMory:SWEep:MARKer	Not supported.	
:MEMory:SWEep:MARKer?	Not supported.	

Table J.1.8-1 Memory Setting Device Messages

J-13

J-14 J.2 System Commands

J.2.1 Display Subsystem

Display subsystem device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.2.1-1.

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:DISPlay:STATe 0 1 2	MG3641A/MG3642A Commands can be used.	:DISPlay:ENABle ON OFF 1 0
:DISPlay:STATe?	:DISPlay:STATe?	:DISPlay:ENABle?
:DISPlay:MENU	Not supported.	
:SYSTem:BELL <boolean></boolean>	MG3641A/MG3642A Commands can be	:SYSTem:BEEPer ON OFF 0 1
.ororem.bill (boorean)	used.	No distinction between bell and alarm.
:SYSTem:BELL?	MG3641A/MG3642A Commands can be	:SYSTem:BEEPer?
.01016m.0111:	used.	No distinction between bell and alarm.
:SYSTem:ALARm	MG3641A/MG3642A Commands can be	:SYSTem:BEEPer ON OFF 0 1
. SISIEM. ALANM	used.	No distinction between bell and alarm.
:SYSTem:ALARm?	MG3641A/MG3642A Commands can be	:SYSTem:BEEPer?
. SISIEM. ALAMII:	used.	No distinction between bell and alarm.
:SYSTem:MEMory SET CLEAR	Not supported.	
:SYSTem:ERRor?	MG3641A/MG3642A Commands can be used.	:SYSTem:ERRor:CODe[:NEXT]?
:SYSTem:TRIGger?	Not supported.	

 Table J.2.1-1
 Display Subsystem Device Messages

J.2.2 SCPI Commands

SCPI device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.2.2-1.

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
:STATus:QUEStionable [:EVENt]?	MG3641A/MG3642A Commands can be used.	
:STATus:QUEStionable:CONDition?	MG3641A/MG3642A Commands can be used.	
:STATus:QUEStionable:ENABle	MG3641A/MG3642A Commands can be used.	
:STATus:QUEStionable:ENABle?	MG3641A/MG3642A Commands can be used.	
:STATus:QUEStionable:PTRansition?	MG3641A/MG3642A Commands can be used.	
:STATus:QUEStionable:NTRansition?	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation [:EVENt] ?	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation:CONDition?	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation:ENABle	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation:ENABle?	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation:PTRansition?	MG3641A/MG3642A Commands can be used.	
:STATus:OPERation:NTRansition?	MG3641A/MG3642A Commands can be used.	

Table J.2.2-1 SCPI Device Messages

J.2

J-15

J-16

IEEE 488.2 Common Commands device messages available in MG3710A/MG3710E/MG3740A are shown in Table J.2.3-1.

Table J.2.3-1	IEEE 488.2 Common Commands Device Messages
	IEEE 40012 Common Commando Dovido mocougoo

MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
*IDN?	*IDN?	
*OPC	*OPC	
*OPC?	*OPC?	
*TST?	*TST?	
*WAI	*WAI	
*CLS	*CLS	
*ESE	*ESE	
*ESE?	*ESE?	
*ESR?	*ESR?	
*SRE	*SRE	
*SRE?	*SRE?	
*STB?	*STB?	

	3-1 Modulation Signal Source Device Message	
MG3641A/MG3642A Commands	MG3710A/10E/40A Commands (MG364xA mode)	MG3710A/10E/40A Commands (SCPI mode) / Remarks
*PCS	Not supported.	
*PCS?	Not supported.	
*SAV	Not supported.	
*RCL	Not supported.	
*OPT?	Not supported.	
*RST	*RST	

Table J.2.3-1 Modulation Signal Source Device Messages (Cont'd)

References are to page numbers.

Symbol and Numbers

ø

φM7-43	
φM Deviation7-44	
φM Source7-48	

Α

A/B Ratio	7-99
A/B Signal Setting	7-98
AC inlet	
Active function frame	3-22
Additional Analog Modulation Input	SG1
connector	3-9
Additional Analog Modulation Input	SG2
connector	3-9
Alarm History	9-21
Saving	9-22
ALC	3-17
Alt key	
Alt-Tab key	
AM	
AM Depth (Lin)	7-17
AM Depth (Log)	7-19
AM Depth Type	7-16
AM modulation	7-14
AM Modulation On/Off	7-16
AM Rate	7-20
AM Source	7-22
Analog I/Q Input Adjustments	7-248
Analog I/Q Output Adjustments	7-251
Analog Modulation	7-12
Analog/Pulse	7-12
Applicable parts	1-10
Application software	1-12
ARB	
ARB On/Off	7-77
ARB Setup	7-95
Arrow keys	3-4
at SyncLoss	8-31
ATT Hold	5-25

Auto Restart	8-17
Auto Resync	8-29
AUX connector	3-8
Auxiliary Function	9-3
Averaging5-55,	9-18
Averaging Count	5 - 56
Averaging Count Value	9-19
AWGN	7-229
On/Off	7-229

В

Back key
Back-up batteryvi
Baseband Clock
Baseband Mode
Baseband Reference Clock Input connector 3-6
Baseband Reference Clock Output connector 3-6
BBDAC
Beep Sound
BER Count
Clear
BER dialog box
BER function menu 8-12
BER Interface
BER Log
BER Test Log
Board Info
Boot Loader Service
BS key
Buffer Output connector
Buffered Trigger

С

C/N Ratio	
C/N Set Signal	
Cal	
Cal key	
Cal Type	
Calibration	11-6
Cancel key	
Carrier Level	7-231
Center Signal	
Channel	4-23

Channel A/B Setup
Channel Freq9-15
Channel group
Regsitering4-28
Channel Group4-25
Channel groups
adding4-33
Deleting4-34
Channel Offset9-16
Channel Offset Value9-17
Channel selection4-23
Channel Setting4-20
Channel Settings9-14
Channel table4-26
Channel tables
Deleting4-35
Opening4-36
Saving
Clear
BER logs8-57
correction table5-39
Deleting channel table4-35
Error Information9-51
List Table6-38
Clear Memory7-128
Clock Edge
Color
setting scheme for screen copies9-73
setting scheme for screen copies9-73 COM Port
setting scheme for screen copies

Copy All Patterns/Copy All Packages
Copy key
Copy Pattern/Copy Package
Correction
User
Correction Points
Count Mode
Coupling7-26, 7-39, 7-50
Create Correction File 5-58
Ctrl key
Current Point
Cycle

D

Data
Data Count8-11
Data Polarity
Data Type
Delay
Trigger
Delete7-127, 9-59
BER logs
Delete pattern from selected drive7-118
Delete Row4-34, 5-38, 6-38
Deleting Parameter File
Display 4-21
Display of 2SG 3-29
Displaying Error Information
Displaying Windows desktop
Disposal11-5
Division
Drive
destination drive for screen copies
Dwell Time
Dwell Type

Ε

Edge	
Trigger	6-51
Edit Item	5-34
Dwell Time	
Frequency	6-31
Level	6-33
Edit Mode	7-138, 7-170

Edit Table	4-26
Enable Active	8-34
Enter key	
Equipment Certificate	viii
Error	
Error Count	8-10
Error Info	9-49
Error Rate	
Ethernet connector	
Event	7-156
Execute Cal	7-244
Ext DC Cal	7-28, 7-41, 7-52
Ext. In Polarity	7-68
Ext. Out Polarity	7-67
External connection	8-5
external display	9-92
EXTMOD	3-19
_	

F

Factory Preset9-47
File name
setting3-40
File Type
file format for screen copies9-72
FIR Error7-11
Firmware
updating9-44
FM7-32
FM Deviation7-33
FM Rate7-35
FM Source7-37
FM/ \$\$M
Focus
Footer frame
FPGA Info9-38
Frame Count
Freq Offset7-101
Freq Offset A/Freq Offset B7-103
Freq Ref4-14
Freq Start
Freq Stop
Freq Sync4-41
Frequency4-2, 4-22
Changing with arrow keys 4-9

G

Gain Balance	
GPIB	
GPIB address	
GPIB connector	3-8

Н

Hard disk access lamp	3-2
HDD slot	3-9
for options	3-9
Help key	3-4

I

I Diff Offset	
I Input connector	
I Level Trimming	
I Offset	7-248, 7-259
I Output connector	
I/Q Calibration	
I/Q Common Offset	
I/Q Delay	7-202, 7-266
I/Q Modulation	
I/Q Output	
I/Q Phase	7-201, 7-264
I/Q Skew	7-265
•	

I/Q Source	7-237
Impedance	.7-27, 7-40, 7-51
Incr Set key	
Initial Pattern	8-36
Insert Row	.4-33, 5-37, 6-37
Install	9-44
Installation Location	
Installation orientation	
Instrument Info	9-32
Instrument Options	9-35
Interface Settings	
Internal Baseband Adjustments	7-259
Internal Channel Correction	7-242
Internal hard disk	vii
(Inverted I) Output connector	3-7
(Inverted Q) Output connector	3-7
IQ Pro key	

L

label	
Language	9-28
Length	8-37
Level	5-7
Level A/Level B	7-97
Level information frame	3-21
Level offset	5-19
Level Offset	5-52
Level Offset Value	5-53
Level Start	6-23
Level Stop	6-24
List Function	6-29
List Table	6-30
LO Sync	
Load	
waveform pattern	7-107
Load All Patterns	7-117
Load Pattern	
Local	
switching remote/local	9-57
Local Input connector	
Local key	
Local Output connector	
Local signal source	4-49

Μ

Main function keys	3-3
Manual mode	6-12
Manual Mode	6-12
Manual Point	6-13
Marker 1	. 7-221
Marker 1 connector	. 7-221
Marker 2	. 7-223
Marker 2 connector	. 7-223
Marker 3	. 7-224
Marker 3 connector	. 7-224
Marker Setup	. 7-168
Marker1 Output connector	3-8
Measure Mode	8-19
Measurement end conditions	8-21
Measurement Units	9-20
Mode	. 7-151
Trigger	6-48
Model	9-12
Model setting	9-12
Modulation	3-33
Modulation control key	3-5
Monitor Out connector	3-8

Ν

Next key	3 - 3
Next Pattern	7-177
No Retrigger	7-157
Noise Bandwidth	7-230
Noise Level	7-232
Number of Secondaries	7-196
Numeric keypad	3-4

0

7-171
5-19
7-141
7-127
4-36
6-41
9-69
5-40
8-51
7-69

Optimize S/N	5-29
Options	
adding	
Out	7-166
Output A/Output B	7-96
output level	
Changing output level with rotary	knob5-10
Output Level	5-2
Output level change	
arrow keys	5-11
Output level limit	5-22
Output level setting	
numeric keypad	5-9
Output Level Setting Item	5-14
Output Level Setting Method	5-7
Output level setting resolution	5-12
OVEN COLD	3-18

Ρ

Panel Keys9-54
Parameter file list
displaying9-70
Pattern File Name8-46
Pattern generation mode7-80
Pattern length8-37
Pattern Length8-46
Pattern Status7-210
Pattern Trigger
Pattern Trigger 1/2/37-184
Pattern Trigger Type7-212
Pattern Trigger1 Input connector 3-8
PatternTrigger7-182
Performance Test
Vector accuracy10-11
Phase Adjust7-29, 7-42, 7-53
Phase noise optimization4-44
Phase Noise Optimize4-44
Play Mode7-179
PN Fix Pattern8-35, 8-36
PN_Fix patterns
Examples of using8-41
Synchronization establishing conditions8-39
Point Trigger6-46, 6-47
Points6-25

Polarity	
power cord	
Power Meter	
Power Meter setting	
Power On	
Power On/Off	3-11
power voltage	
power-on	
parameters at	
Preset	
Preset All	
Preset key	3-3
Product Info	
Pulse	7-54, 7-56
Pulse 2 Delay	
Pulse 2 Width	
Pulse Delay	
Pulse Mod	7-211
Pulse Period	
Pulse Rate	
Pulse Source	
Pulse Sync	
Pulse Video	
Pulse Width	

Q

Q Diff Offset	
Q Input connector	3-5
Q Level Trimming	
Q Offset	7-249, 7-261
Q Output connector	3-7
Quad. Angle	

R

Rate Mismatch	7-10
Raw Socket Port Number	9-29
rear-panel	3-6
Recall	9-69
Recall key	
Recalling Parameter File	9-69
Reference	5-16
Reference Input connector	3-7
Reference oscillator	4-47
Relative level display	5-16

11-4
7-180
3-25
7-78, 9-56
7-158
7-247
8-26
7-137, 7-138
3-34
3-5
4-45
7-78
7-203
7-204
7-214
3-30

S

Setup	7-47
SG Port	3-35
SG1 key	
SG2 key	
Shift key	
Show Details	7-114
Source	62, 7-185
Trigger	6-49
Spectrum A/Spectrum B	7-106
Spectrum reverse	4-45
Standard configuration	1 - 3
Start BER Test	8-14
Start Frame Trigger Input connector	
Start Freq	5-50
Start Offset	7-105
Start/Frame Trigger7-1	46, 7-147
Start/Stop Sweep	
Status	
Step Shape	6-27
Stop BER Test	
Stop Freq	5-51
Subitem	
Sweep Direction	6-11
Sweep Function	6-18
Sweep Out	6-14
Sweep point number	
Recalling	
Sweep points	6-25
Sweep Repeat	6-10
Sweep start frequency	6-19
Sweep start level	
Sweep stop frequency	6-20
Sweep stop level	6-24
Sweep Type	6-9
Sweep/List	
for frequency	6-7
for level	6-8
Setting all Sweep/List function to Of	f 6-6
Sweep/List Function	
Sweet Output connector	
Switching Point	7-188
Sync	7-199
Level	5-27
Sync Length	8-50

Sync Loss

Conditions for detecting	8-30
Operations when detecting	8-31
Sync Multi SG	7-190
Sync Start	8-49
Sync Trig Out	7-227
Sync Type	7-195
SyncLoss Count	
System Recovery	9-97, 9-98
System Settings	9-30

Т

Tab key	
TCP/IP port number	
Terminator	
Threshold X, Threshold Y	
Timer Period	6-52
To Drive	
To Memory	
Top Function Menu	3-32
Top key	
Touch Panel	
Transportation	
Trigger Key	6-52, 7-155, 7-189
Trigger Out Polarity	6-16
Troubleshooting	
Туре	

U

3-18
7-112
3-5, 3-8
vi
11 - 3
5-45
8-43, 8-47
8-45
8-48

W

Warranty	viii
Waveform	7-23, 7-38, 7-49
Waveform Licenses	
Adding and deleting	
Waveform Restart	
Wideband	
Width	
Width 1/ Width 2	
Windows Security Measures	
Z	

Zero	Sensor	5-57,	9-9