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

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

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

⚠️ **CAUTION**
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.
For Safety

DANGER

- 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.

WARNING

- 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 and descriptions to indicate other dangers.

- 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.

- Electric Shock
  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.

- Repair
  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.
## For Safety

### WARNING

<table>
<thead>
<tr>
<th>Calibration</th>
<th>Falling Over</th>
<th>Battery Fluid</th>
<th>LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The performance-guarantee seal verifies the integrity of the equipment. To ensure the continued integrity of the equipment, 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 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.</td>
<td>• 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.</td>
<td>• DO NOT short the battery terminals and never attempt to 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.</td>
<td>• 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.</td>
</tr>
</tbody>
</table>
For Safety

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

CAUTION

This equipment uses a Poly-carbomonofluoride 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.

This equipment uses the USB memory stick as external storage media for storing data and programs. 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 memory stick from the equipment while it is being accessed.
- The USB memory stick 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 media.
# For Safety

## CAUTION

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.

### Hard disk

Please use the carrying case or the original packing materials when you transport it.

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 environment

This equipment is designed for an industrial 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.

### Notes on Handling

(When Rubidium Reference Oscillator Option is Installed)
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. However, software fixes will be made in accordance with the separate Software End-User License Agreement. Moreover, 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, flooding, 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\(^{(\text{Note})}\).
- 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 injury or financial loss of the customer due to the use of or a failure to be able to use this equipment.
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, 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™ 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 read this Software End-User License Agreement (hereafter this EULA) carefully before using (includes executing, copying, registering, etc.) this software (includes programs, databases, scenarios, etc., used to operate, set, etc., Anritsu electronic equipment). By reading this EULA and using this software, you are agreeing to be bound by the terms of its contents 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.

1. Grant of License and Limitations
   1. Regardless of whether this Software was purchased from or provided free-of-charge by Anritsu, you agree not to rent, lease, lend, or otherwise distribute this Software to third parties and further agree not to disassemble, recompile, reverse engineer, modify, or create derivative works of this Software.
   2. You may make one copy of this Software for backup purposes only.
   3. You are not permitted to reverse engineer this software.
   4. This EULA allows you to install one copy of this Software on one piece of Equipment.

2. Disclaimers
   To the extent not prohibited by law, in no event shall Anritsu be liable for personal injury, 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, arising out of or related to your use or inability to use this Software.

3. Limitation of Liability
   a. If a fault (bug) is discovered in this Software, preventing operation as described in the operation manual or specifications whether or not the customer uses this software as described in the manual, Anritsu shall at its own discretion, fix the bug, or exchange the software, or suggest a workaround, free-of-charge. However, notwithstanding the above, the following items shall be excluded from repair and warranty.
      i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.
      ii) If this Software is used in conjunction with other non-Anritsu-approved software.
      iii) Recovery of lost or damaged data.
      iv) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
      v) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, etc.
   b. Expenses incurred for transport, hotel, daily allowance, etc., for on-site repairs by Anritsu engineers necessitated by the above faults shall be borne by you.
   c. The warranty period for faults listed in article 3a above covered by this EULA shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair, whichever is longer.
4. Export Restrictions
You may not use or otherwise export or re-export directly or indirectly this Software except as authorized by Japanese and United States law. In particular, this software may not be exported or re-exported (a) into any Japanese or US embargoed countries or (b) to anyone on the Japanese or US Treasury Department's list of Specially Designated Nationals or the US Department of Commerce Denied Persons List or Entity List. By using this Software, you warrant that you are not located in any such country or on any such list. You also agree that you will not use this Software for any purposes prohibited by Japanese and US law, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction.

5. Termination
Anritsu shall deem this EULA terminated if you violate any conditions described herein. This EULA shall also be terminated if the conditions herein cannot be continued for any good reason, such as violation of copyrights, patents, or other laws and ordinances.

6. Reparations
If Anritsu suffers any 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.

7. Responsibility after Termination
Upon termination of this EULA in accordance with item 5, you shall cease all use 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.

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

9. Court of Jurisdiction
This EULA shall be interpreted in accordance with Japanese law and any disputes that cannot be resolved by negotiation described in Article 8 shall be settled by the Japanese courts.
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:

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 or CompactFlash media after undergoing a thorough virus check.
- Adding software
  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 (intentionally harmful software) and virus.
  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 product(s) 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: MG3710A Vector Signal Generator
   Model: MG3740A Analog Signal Generator

   EMC: Directive 2014/30/EU
   LVD: Directive 2014/35/EU
   RoHS: Directive 2011/65/EU

3. Applied Standards
   - EMC: Emission: EN 61326-1: 2013 (Class A)
     Immunity: EN 61326-1: 2013 (Table 2)

   Performance Criteria*

<table>
<thead>
<tr>
<th>Standard</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 61000-4-2 (ESD)</td>
<td>B</td>
</tr>
<tr>
<td>IEC 61000-4-3 (EMF)</td>
<td>A</td>
</tr>
<tr>
<td>IEC 61000-4-4 (Burst)</td>
<td>B</td>
</tr>
<tr>
<td>IEC 61000-4-5 (Surge)</td>
<td>B</td>
</tr>
<tr>
<td>IEC 61000-4-6 (CRF)</td>
<td>A</td>
</tr>
<tr>
<td>IEC 61000-4-8 (RPFMF)</td>
<td>A</td>
</tr>
<tr>
<td>IEC 61000-4-11 (V dip/short)</td>
<td>B, C</td>
</tr>
</tbody>
</table>

*: 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 (Pollution Degree 2)
- RoHS: EN 50581: 2012 (Category 9)

If the third digit of the serial number is “6”, the product complies with RoHS.

Serial number example

4. Authorized representative

Name: Murray Coleman
Head of Customer Service EMEA
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 product(s) 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
   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 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 Vector Signal Generator
MG3740A Analog Signal Generator Operation Manual (Main frame)

MG3700A/MG3710A Vector Signal Generator
MG3740A Analog Signal Generator Operation Manual (IQproducer™)

MG3710A Vector Signal Generator Operation Manual (Standard Waveform Pattern)

IQproducer™ Operation Manuals for each communication system

Scope of This Manual
This manual mainly describes operation, maintenance, and remote control of the MG3710A Vector Signal Generator. Description of the basic functions and the outline of operation start from Chapter 3 onwards.
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Chapter 1  Outline

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1.1 Product Overview

The MG3710A 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 has the following features, and one MG3710A 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 mainframe.

The MG3710A/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/MG3740A.
1.2 Product Configuration

1.2.1 Standard configuration

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

<table>
<thead>
<tr>
<th>Items</th>
<th>Model/ Symbol</th>
<th>Product Name</th>
<th>Q'ty</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main unit</td>
<td>MG3710A</td>
<td>Vector signal generator</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MG3740A</td>
<td>Analog signal generator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td>Power cord</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P0031A</td>
<td>USB memory</td>
<td></td>
<td>1</td>
<td>256 MB or more USB 2.0 Flash Driver</td>
</tr>
<tr>
<td>---</td>
<td>Installation CD-ROM</td>
<td></td>
<td>1</td>
<td>Application software, operation manual CD-ROM</td>
</tr>
</tbody>
</table>
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 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.

Table 1.2.2-1 Additional Options at Shipping (MG3710A)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710A-001</td>
<td>Rubidium Reference Oscillator</td>
<td>±1 × 10^{-10}/month</td>
</tr>
<tr>
<td>MG3710A-002</td>
<td>High Stability Reference Oscillator</td>
<td>±1 × 10^{-7}/year</td>
</tr>
<tr>
<td>MG3710A-011</td>
<td>2ndary HDD</td>
<td></td>
</tr>
<tr>
<td>MG3710A-017</td>
<td>Universal Input/Output</td>
<td></td>
</tr>
<tr>
<td>MG3710A-018</td>
<td>Analog IQ Input/Output</td>
<td></td>
</tr>
<tr>
<td>MG3710A-021</td>
<td>BER Test Function</td>
<td></td>
</tr>
<tr>
<td>MG3710A-029</td>
<td>OS Upgrade to Windows7</td>
<td></td>
</tr>
<tr>
<td>MG3710A-032</td>
<td>1st RF 100kHz to 2.7GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-034</td>
<td>1st RF 100kHz to 4GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-036</td>
<td>1st RF 100kHz to 6GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-041</td>
<td>High Power Extension for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-042</td>
<td>Low Power Extension for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-043</td>
<td>Reverse Power Protection for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-045</td>
<td>ARB Memory Upgrade 256M sample for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-046</td>
<td>ARB Memory Upgrade 1024M sample for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-048</td>
<td>Combination of Baseband Signal for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-049</td>
<td>AWGN for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-050</td>
<td>Additional Analog Modulation Input for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-062</td>
<td>2nd RF 100kHz to 2.7GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-064</td>
<td>2nd RF 100kHz to 4GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-066</td>
<td>2nd RF 100kHz to 6GHz</td>
<td></td>
</tr>
<tr>
<td>MG3710A-071</td>
<td>High Power Extension for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-072</td>
<td>Low Power Extension for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-073</td>
<td>Reverse Power Protection for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-075</td>
<td>ARB Memory Upgrade 256M sample for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-076</td>
<td>ARB Memory Upgrade 1024M sample for 2nd RF</td>
<td></td>
</tr>
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### Table 1.2.2-1 Additional Options at Shipping (MG3710A) (Cont'd)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710A-078</td>
<td>Combination of Baseband Signal for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-079</td>
<td>AWGN for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-080</td>
<td>Additional Analog Modulation Input for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-313</td>
<td>Removable HDD</td>
<td></td>
</tr>
</tbody>
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### Table 1.2.2-2 Additional Options after Shipping (MG3710A)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710A-101</td>
<td>Rubidium Reference Oscillator Retrofit ±1 × 10⁻¹⁰/month</td>
<td></td>
</tr>
<tr>
<td>MG3710A-102</td>
<td>High Stability Reference Oscillator Retrofit ±1 × 10⁻⁷/year</td>
<td></td>
</tr>
<tr>
<td>MG3710A-111</td>
<td>2ndary HDD Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-117</td>
<td>Universal Input/Output Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-118</td>
<td>Analog IQ Input/Output</td>
<td></td>
</tr>
<tr>
<td>MG3710A-121</td>
<td>BER Test Function Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-141</td>
<td>High Power Extension for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-142</td>
<td>Low Power Extension for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-143</td>
<td>Reverse Power Protection for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-145</td>
<td>ARB Memory Upgrade 256M sample for 1st RF Retrofit</td>
<td></td>
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<tr>
<td>MG3710A-146</td>
<td>ARB Memory Upgrade 1024M sample for 1st RF Retrofit</td>
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</tr>
<tr>
<td>MG3710A-148</td>
<td>Combination of Baseband Signal for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-149</td>
<td>AWGN for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-150</td>
<td>Additional Analog Modulation Input Retrofit for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-162</td>
<td>2nd RF 100kHz to 2.7GHz Retrofit</td>
<td>Available only when 2nd RF is not installed. Once this option is installed, you cannot change the frequency range.</td>
</tr>
<tr>
<td>MG3710A-164</td>
<td>2nd RF 100kHz to 4GHz Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-166</td>
<td>2nd RF 100kHz to 6GHz Retrofit</td>
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<tr>
<td>MG3710A-171</td>
<td>High Power Extension for 2nd RF Retrofit</td>
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<tr>
<td>MG3710A-172</td>
<td>Low Power Extension for 2nd RF Retrofit</td>
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<td>MG3710A-173</td>
<td>Reverse Power Protection for 2nd RF Retrofit</td>
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<tr>
<td>MG3710A-175</td>
<td>ARB Memory Upgrade 256M sample for 2nd RF Retrofit</td>
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<td>MG3710A-176</td>
<td>ARB Memory Upgrade 1024M sample for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-178</td>
<td>Combination of Baseband Signal for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-179</td>
<td>AWGN for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3710A-180</td>
<td>Additional Analog Modulation Input Retrofit for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3710A-181</td>
<td>CPU/Windows7 Upgrade Retrofit</td>
<td></td>
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### Table 1.2.2-3 Warranty Period Extension Options (MG3710A)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>MG3710A-ES210</td>
<td>Extended 2-year warranty service</td>
<td></td>
</tr>
<tr>
<td>MG3710A-ES310</td>
<td>Extended 3-year warranty service</td>
<td></td>
</tr>
<tr>
<td>MG3710A-ES510</td>
<td>Extended 5-year warranty service</td>
<td></td>
</tr>
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### Table 1.2.2-4 Additional Options at Shipping (MG3740A)

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<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
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<tr>
<td>MG3740A-001</td>
<td>Rubidium Reference Oscillator</td>
<td>±1 × 10^{-10}/month</td>
</tr>
<tr>
<td>MG3740A-002</td>
<td>High Stability Reference Oscillator</td>
<td>±1 × 10^{-1}/year</td>
</tr>
<tr>
<td>MG3740A-011</td>
<td>2ndary HDD</td>
<td></td>
</tr>
<tr>
<td>MG3740A-017</td>
<td>Universal Input/Output</td>
<td></td>
</tr>
<tr>
<td>MG3740A-020</td>
<td>Digital Modulation</td>
<td></td>
</tr>
<tr>
<td>MG3740A-021</td>
<td>BER Test Function</td>
<td></td>
</tr>
<tr>
<td>MG3740A-029</td>
<td>OS Upgrade to Windows7</td>
<td></td>
</tr>
<tr>
<td>MG3740A-032</td>
<td>1st RF 100kHz to 2.7GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-034</td>
<td>1st RF 100kHz to 4GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-036</td>
<td>1st RF 100kHz to 6GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-041</td>
<td>High Power Extension for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-042</td>
<td>Low Power Extension for 1st RF</td>
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</tr>
<tr>
<td>MG3740A-043</td>
<td>Reverse Power Protection for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-045</td>
<td>ARB Memory Upgrade 256M sample for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-048</td>
<td>Combination of Baseband Signal for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-050</td>
<td>Additional Analog Modulation Input for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-062</td>
<td>2nd RF 100kHz to 2.7GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-064</td>
<td>2nd RF 100kHz to 4GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-066</td>
<td>2nd RF 100kHz to 6GHz</td>
<td></td>
</tr>
<tr>
<td>MG3740A-071</td>
<td>High Power Extension for 2nd RF</td>
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</tr>
<tr>
<td>MG3740A-072</td>
<td>Low Power Extension for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-073</td>
<td>Reverse Power Protection for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-075</td>
<td>ARB Memory Upgrade 256M sample for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-078</td>
<td>Combination of Baseband Signal for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-080</td>
<td>Additional Analog Modulation Input for 2nd RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-313</td>
<td>Removable HDD</td>
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</tr>
</tbody>
</table>
### 1.2 Product Configuration

#### Table 1.2.2-5 Additional Options after Shipping (MG3740A)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3740A-101</td>
<td>Rubidium Reference Oscillator Retrofit</td>
<td>±1 × 10⁻¹⁰/month</td>
</tr>
<tr>
<td>MG3740A-102</td>
<td>High Stability Reference Oscillator Retrofit</td>
<td>±1 × 10⁻⁷/year</td>
</tr>
<tr>
<td>MG3740A-111</td>
<td>2ndary HDD Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-117</td>
<td>Universal Input/Output Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-120</td>
<td>Digital Modulation Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-121</td>
<td>BER Test Function Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-141</td>
<td>High Power Extension for 1st RF Retrofit</td>
<td></td>
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<tr>
<td>MG3740A-142</td>
<td>Low Power Extension for 1st RF Retrofit</td>
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</tr>
<tr>
<td>MG3740A-143</td>
<td>Reverse Power Protection for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-145</td>
<td>ARB Memory Upgrade 256M sample for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-148</td>
<td>Combination of Baseband Signal for 1st RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-150</td>
<td>Additional Analog Modulation Input Retrofit for 1st RF</td>
<td></td>
</tr>
<tr>
<td>MG3740A-162</td>
<td>2nd RF 100kHz to 2.7GHz Retrofit</td>
<td>Available only when 2nd RF is not installed. Once this option is installed, you cannot change the frequency range.</td>
</tr>
<tr>
<td>MG3740A-164</td>
<td>2nd RF 100kHz to 4GHz Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-166</td>
<td>2nd RF 100kHz to 6GHz Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-171</td>
<td>High Power Extension for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-172</td>
<td>Low Power Extension for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-173</td>
<td>Reverse Power Protection for 2nd RF Retrofit</td>
<td></td>
</tr>
<tr>
<td>MG3740A-175</td>
<td>ARB Memory Upgrade 256M sample for 2nd RF Retrofit</td>
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<tr>
<td>MG3740A-178</td>
<td>Combination of Baseband Signal for 2nd RF Retrofit</td>
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<tr>
<td>MG3740A-180</td>
<td>Additional Analog Modulation Input Retrofit for 2nd RF</td>
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</tr>
<tr>
<td>MG3740A-181</td>
<td>CPU/Windows7 Upgrade Retrofit</td>
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#### Table 1.2.2-6 Warranty Period Extension Options (MG3740A)

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3740A-ES210</td>
<td>Extended 2-year warranty service</td>
<td></td>
</tr>
<tr>
<td>MG3740A-ES310</td>
<td>Extended 3-year warranty service</td>
<td></td>
</tr>
<tr>
<td>MG3740A-ES510</td>
<td>Extended 5-year warranty service</td>
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### 1.2.3 Applicable parts

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

<table>
<thead>
<tr>
<th>Model/Symbol</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3580AE</td>
<td>MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)</td>
<td>Printed version</td>
</tr>
<tr>
<td>W2496AE</td>
<td>MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)</td>
<td>Printed version</td>
</tr>
<tr>
<td>W3581AE</td>
<td>MG3710A Operation Manual (Standard Waveform Pattern)</td>
<td>Printed version</td>
</tr>
<tr>
<td>K240B</td>
<td>Power divider (K connector)</td>
<td>DC to 26.5 GHz, 50 Ω K-J, 1 W max</td>
</tr>
<tr>
<td>MA1612A</td>
<td>Four-port junction pad</td>
<td>5 MHz to 3 GHz, N-J</td>
</tr>
<tr>
<td>MP752A</td>
<td>Termination</td>
<td>DC to 12.4 GHz, 50 Ω N-P</td>
</tr>
<tr>
<td>MA2512A</td>
<td>Bandpass filter</td>
<td>Supports W-CDMA, Passband: 1.92 to 2.17 GHz</td>
</tr>
<tr>
<td>J0576B</td>
<td>Coaxial cord</td>
<td>Length: Approx. 1 m (N-P•5D-2W•N-P)</td>
</tr>
<tr>
<td>J0576D</td>
<td>Coaxial cord</td>
<td>Length: Approx. 2 m (N-P•5D-2W•N-P)</td>
</tr>
<tr>
<td>J0127A</td>
<td>Coaxial cord</td>
<td>Length: Approx. 1 m (BNC-P•RG58A/U•BNC-P)</td>
</tr>
<tr>
<td>J0127B</td>
<td>Coaxial cord</td>
<td>Length: Approx. 2 m (BNC-P•RG58A/U•BNC-P)</td>
</tr>
<tr>
<td>J0127C</td>
<td>Coaxial cord</td>
<td>Length: Approx. 0.5 m (BNC-P•RG58A/U•BNC-P)</td>
</tr>
<tr>
<td>J0322A</td>
<td>Coaxial Cable</td>
<td>DC to 18 GHz, Length: Approx. 0.5 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)</td>
</tr>
<tr>
<td>J0322B</td>
<td>Coaxial Cable</td>
<td>DC to 18 GHz, Length: Approx. 1 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)</td>
</tr>
<tr>
<td>J0322C</td>
<td>Coaxial Cable</td>
<td>DC to 18 GHz, Length: Approx. 1.5 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)</td>
</tr>
<tr>
<td>J0322D</td>
<td>Coaxial Cable</td>
<td>DC to 18 GHz, Length: Approx. 2 m (SMA-P•50 Ω SUCOFLEX104•SMA-P)</td>
</tr>
<tr>
<td>J0004</td>
<td>Coaxial adapter</td>
<td>DC to 12.4 GHz, 50 Ω N-P, SMA-J</td>
</tr>
<tr>
<td>J1261B</td>
<td>Shielded Ethernet cable</td>
<td>Straight cable, length: Approx. 3 m</td>
</tr>
<tr>
<td>J1261D</td>
<td>Shielded Ethernet cable</td>
<td>Cross cable, length: Approx. 3 m</td>
</tr>
<tr>
<td>J0008</td>
<td>GPIB connection cable</td>
<td>Length: Approx. 2 m</td>
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<tr>
<td>J1539A</td>
<td>Aux Conversion Adaptor</td>
<td>BNC-J – DX30A-50P (50)</td>
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### Table 1.2.3-1  Applicable Parts (Cont’d)

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

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

Application software is sold separately.

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

Table 1.2.4-1 lists examples of application software that are available for the MG3710A. 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.

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX370101A</td>
<td>HSDPA IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370102A</td>
<td>TDMA IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370103A</td>
<td>CDMA2000 1xEV-DO IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370104A</td>
<td>Multi-carrier IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370105A</td>
<td>Mobile WiMAX IQproducer™</td>
<td>CD-ROM containing a license and operation manual</td>
</tr>
<tr>
<td>MX370106A</td>
<td>DVB-T/H IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370107A</td>
<td>Fading IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370108A</td>
<td>LTE IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370109A</td>
<td>XG-PHS IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370110A</td>
<td>LTE TDD IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370111A</td>
<td>WLAN IQproducer™</td>
<td></td>
</tr>
<tr>
<td>MX370112A</td>
<td>TD-SCDMA IQproducer™</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Product Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX370102A</td>
<td>TDMA IQproducer™</td>
<td>CD-ROM containing a license and operation manual</td>
</tr>
<tr>
<td>MX370107A</td>
<td>Fading IQproducer™</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 2  Preparation

This section describes items that you should know before using the MG3710A/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  Installation 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/MG3740A horizontally as shown in the figure below.

![Good and No Good orientations](image)

**CAUTION**

If the MG3710A/MG3740A is not installed in a “good” direction as above, a small shock may turn it over and harm the user.
2.1 Installation Location

2.1.2 Distance from surrounding objects

A fan is installed at the back of the MG3710A/MG3740A to prevent the internal temperature from rising. When installing the MG3710A/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.

![Diagram of distance from surrounding objects]

Figure 2.1.2-1 Distance From Surrounding Objects

2.1.3 Installation location conditions

The MG3710A/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.

![WARNING Label](image)

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.

2.2.2 Reverse power
The maximum reverse power input of the RF output connector of the MG3710A/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
- ±50 V DC Max

AC input
- When both 1st RF and 2nd RF do not have the Option-043/143/073/173 installed.
  - 2W (nominal)
- When the Option-043/143/073/173 installed.
  - 20 W (1 MHz < Reverse input power frequency ≤ 1 GHz) (nominal)
  - 20 W (1 GHz < Reverse input power frequency ≤ 2 GHz) (nominal)
  - 10 W (2 GHz < Reverse input power frequency ≤ 6 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

⚠️ CAUTION

1. 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.

2. 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.
CAUTION

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.
2.2 Items to Check Before Use
Chapter 2  Preparation

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.

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Voltage range</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Vac system</td>
<td>100 to 120 V</td>
<td>50 to 60 Hz</td>
</tr>
<tr>
<td>200 Vac system</td>
<td>200 to 240 V</td>
<td>50 to 60 Hz</td>
</tr>
</tbody>
</table>

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

CAUTION

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

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.

⚠️ WARNING

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.
CAUTION

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.
Chapter 3  Operation

This chapter describes information you should know to operate the MG3710A/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.

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  3.3.2  Frequency information frame ............................... 3-22
  3.3.3  Level information frame ...................................... 3-22
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  3.3.5  Function display frame ....................................... 3-25
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  3.3.9  Display of 2SG .................................................... 3-31
  3.3.10  RPP ................................................................. 3-32

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  3.4.1  Modulation ......................................................... 3-35
  3.4.2  RF Output ........................................................... 3-36
  3.4.3  SG Port .............................................................. 3-37

3.5  Common Setting Operations ........................................... 3-38
  3.5.1  Specifying parameters as numeric values .............. 3-38
  3.5.2  Setting character strings ...................................... 3-40
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3.1 Part Names

3.1.1 Front panel

This section describes the front-panel keys and connectors.

![Front Panel Diagram](image)

**Figure 3.1.1-1 Front Panel**

1. **Power switch**
   Press to switch between the standby state (AC power supplied) and power-on state. The Power lamp lights orange at Standby and green at Power On. Press the power switch for about 2 seconds.

2. **Hard disk access lamp**
   Lights when accessing the internal hard disk.

3. **Copy key**
   Press to capture display screen and save to file.

4. **Recall key**
   Press to display the function menu to recall the parameter file.

5. **Save key**
   Press to display the function menu to save the parameter file.

6. **Cal key**
   Press to display the Calibration menu.
3.1 Part Names

Remote lamp/Local key
Remote lamp
Lights when in remote-control state
Local key
Press to reset the remote-control state with GPIB, Ethernet, or USB (B) to the local-control state and enable the panel setting.

Preset key
Press to display the Preset menu. Resets parameters to initial settings.

Function keys
Selects or configures function menu displayed on the right of the screen. The function menu is provided in multiple pages and layers. The number on the bottom of the screen indicates the menu page number.

Top key
Press to go back to the uppermost (top) layer.

Next key
Press to go to the next page.

Back key
Press to go back to the previous layer within the function menu.

SG1/SG2/IQ Pro key
Press to set and control SG1.
Press to set and control SG2.
Press to load IQproducer.
Sometimes, there may be a delay of several to 20 or so seconds until IQproducer starts after pressing the IQpro key. Subsequent key presses are ignored until IQproducer is running.

Main function keys
Display function menus to set and execute main functions.

Press to set items of Frequency.
Press to set items of Level.
Press to set items of Sweep/List.
Press to set items of Mode of the Baseband function.
### Chapter 3 Operation

Press to set items of AM modulation.

Press to set items of FM/φM modulation.

Press to set items of Pulse modulation.

Press to set items of I/Q signals.

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 sequentially while lights.

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

Behaves same as the Tab key.

Behaves same as the Alt key.

Press to delete the last entered digit or character.

Behaves same as the Ctrl key.

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.

Behaves same as the Alt-Tab key.

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

Press to select items or change settings.

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.
3.1 Part Names

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

16 I Input connector
Inputs signals of I-phase when executing vector modulation of external baseband signals.
MG3740A is not equipped with this connector.

17 Q Input connector
Inputs signals of Q-phase when executing vector modulation of external baseband signals.
MG3740A is not equipped with this connector.

18 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 output.

RF Output connector
Outputs RF signal.

19 2nd RF Output (Option)
Modulation control key
This command sets the SG2 Modulation On/Off. The lamp lights when RF signals are being modulated.

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 memory.
3.1.2 Rear panel

This section describes the rear-panel connectors.

**Figure 3.1.2-1 Rear Panel**

1. **LO Input**
   - Local Input connector
   - Outputs external local signal.
   - This connector cannot be used in MG3740A.

2. **LO Output**
   - Local Output connector
   - Outputs Local signal.
   - This connector cannot be used in MG3740A.

3. **BB REF CLK Input**
   - Baseband Reference Clock Input connector
   - 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. **BB REF CLK Output**
   - Baseband Reference Clock Output connector
   - Outputs sampling clock signals of the internal arbitrary waveform generator.
   - This connector cannot be used in MG3740A.
<table>
<thead>
<tr>
<th>Chapter 3 Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
</tr>
<tr>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>7</strong></td>
</tr>
<tr>
<td><strong>8</strong></td>
</tr>
<tr>
<td><strong>9</strong></td>
</tr>
<tr>
<td><strong>10</strong></td>
</tr>
<tr>
<td><strong>11</strong></td>
</tr>
<tr>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>
### 3.1 Part Names

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Marker1 Output connector</td>
<td>Outputs Marker signal. The setting of output signals is based on the Table 7.4.2-1 “Output Connectors Function Menu”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Pattern Trigger1 Input connector</td>
<td>Inputs external signals to be used for trigger signals. The setting of input signals is based on the Table 7.4.1-1 “Input Connector Function Menu”. This connector is pulled up internally.</td>
</tr>
<tr>
<td>15</td>
<td>GPIB connector</td>
<td>For external control via GPIB</td>
</tr>
<tr>
<td>16</td>
<td>USB connector (type A)</td>
<td>Connect the accessory USB keyboard, mouse or USB memory.</td>
</tr>
<tr>
<td>17</td>
<td>USB connector (type B)</td>
<td>For external control via USB</td>
</tr>
<tr>
<td>18</td>
<td>Ethernet connector</td>
<td>Connects PC or Ethernet network.</td>
</tr>
<tr>
<td>19</td>
<td>Monitor Out connector</td>
<td>This is a RGB connector to connect an external display.</td>
</tr>
<tr>
<td>20</td>
<td>AUX connector</td>
<td>This is a complex connector to input baseband clock reference or error rate measurement of vector signal generator option. See Table 3.1.2-1 for internal pin assignment.</td>
</tr>
</tbody>
</table>
Chapter 3  Operation

21  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
    External Modulation Input SG1 connector
    This is an option connector for additional analog modulation
    input for the SG1.

25  SG2
    External Modulation Input SG2 connector
    This is an option connector for additional analog modulation
    input for the SG2.

26  Reserve 1
    Terminal for future extension

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

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.
Chapter 3  Operation

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.
2. Connect the plug-side end of power cord to the AC power outlet. The MG3710A/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 lamp lights green, and loading starts. lamp (orange) goes off.

When the power turns on, Windows starts, and then the software of the MG3710A/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.

![Start Screen](image-url)
3.2 Power On/Off

3.2.2 Power off

The procedure for turning the power off is as follows:

**To use panel keys to turn the power off:**
1. When you press the power switch, the applications start closing, shutdown starts, the lamp (green) of the power switch goes off, lamp lights orange, and the power turns off. The MG3710A/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/MG3740A to turn the power off:**
1. Connect the provided mouse to the MG3710A/MG3740A, and open the Start menu on the Windows task bar.
2. Select **Shut down.**
3. Select **Shut down.**
4. Shutdown starts, the Power lamp (green) of the power switch goes off, lamp lights orange, and the power turns off. The MG3710A/MG3740A goes into the standby state.

**To perform a forced-end:**
1. Press the power switch for more than 4 seconds. The Power lamp (green) of the power switch goes off, lamp lights orange, and the power turns off. The MG3710A/MG3740A goes into the standby state.

*Note:*
1. 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.
2. Unplugging while you are accessing to the hard disk may cause a failure of the hard disk. You must unplug the MG3710A/MG3740A when the power is off.
Chapter 3  Operation

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:

- **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**: 
- **Resident frame**: 
- **Footer frame**: 
- **Function menu frame**: 

![Figure 3.3-1 Basic Screen (1SG)](image)
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.

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.

Table 3.3.1-1  Common Indicators Alarm Information

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm information</td>
<td>May be displayed even when there is no error.</td>
<td></td>
</tr>
<tr>
<td>ALC</td>
<td>ALC Auto Level Control</td>
<td>Indicates that the output level may not have been reached a certain value.</td>
</tr>
<tr>
<td>BBDAC</td>
<td>BBDAC Baseband Digital to Analog Converter</td>
<td>Indicates that clipping occurred in Baseband DAC or the digital block due to overflow.</td>
</tr>
<tr>
<td>OVEN COLD</td>
<td>OVEN COLD</td>
<td>Indicates that the internal reference oscillator frequency may not be stable within three minutes after the power is turned on.</td>
</tr>
<tr>
<td>Alarm information</td>
<td>Displayed for errors.</td>
<td></td>
</tr>
<tr>
<td>UNLOCK</td>
<td>UNLOCK</td>
<td>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.</td>
</tr>
<tr>
<td>EXTMOD</td>
<td>EXTMOD</td>
<td>Indicates that the level of signal input to the External Modulation Input connector is greater than 2.03 Vp-p.</td>
</tr>
</tbody>
</table>

For handling when the alarm information is displayed, refer to 11.6 “Troubleshooting”.
Chapter 3  Operation

ALC Alarm

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

Response  <status>

Parameter
<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
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>

Parameter

<status> Status
LINT Lock BB Int Clock
UINT Unlock BB Int Clock
LEXT Lock BB Ext Clock
UEXT Unlock BB Ext Clock

Programming Example

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>

Parameter

<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>  NORM (Normal) or CLIP (Clipping)

Programming Example
To check the external modulation input for “clipping” caused by overflow.
EXTM:ERR?
> NORM
### Table 3.3.1-2 Common Indicator Status Information

<table>
<thead>
<tr>
<th>Status information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARB</strong></td>
<td>Indicates that the ARB function is being used.</td>
</tr>
<tr>
<td><strong>SWEEP</strong></td>
<td>Indicates that the SWEEP function is being used.</td>
</tr>
<tr>
<td><strong>AM</strong></td>
<td>Indicates AM modulation is being executed.</td>
</tr>
<tr>
<td><strong>FM</strong></td>
<td>Indicates FM modulation is being executed.</td>
</tr>
<tr>
<td><strong>$\phi_M$</strong></td>
<td>Indicates $\phi_M$ modulation is being executed.</td>
</tr>
<tr>
<td><strong>PULSE</strong></td>
<td>Indicates Pulse modulation is being executed.</td>
</tr>
<tr>
<td><strong>CORR</strong></td>
<td>Indicates that the User Correction function is on.</td>
</tr>
<tr>
<td><strong>AWGN</strong></td>
<td>Indicates AWGN signals are being output.</td>
</tr>
<tr>
<td><strong>PLAY</strong></td>
<td>Indicates waveform patterns are being output.</td>
</tr>
<tr>
<td><strong>WAIT</strong></td>
<td>Indicates waveform patterns has stopped.</td>
</tr>
<tr>
<td><strong>WIDE</strong></td>
<td>Indicates that the bandwidth characteristic of RF output is Wideband mode.</td>
</tr>
<tr>
<td><strong>INTCORR</strong></td>
<td>Indicates that correction in the baseband bandwidth is enabled.</td>
</tr>
</tbody>
</table>
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”.

![Frequency Information Frame (Frequency Display)](image1)

Figure 3.3.2-1 Frequency Information Frame (Frequency Display)

![Frequency Information Frame (Channel Display)](image2)

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”.

![Level Information Frame](image3)

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)]

![Figure 3.3.4-3 Character Input Dialog Box (File Names)]

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.
4. Increment
   Displays a unit of step for setting with rotary knob or arrow keys.
5. 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”.
6. Rotary knob switch
   Enables/locks the rotary knob.
   Refer to 3.5.1 “Specifying parameters as numeric values”.
7. Character pallet
Chapter 3  Operation

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.

![Hardware Block Chart](image)

**Figure 3.3.5-1 Function Display Frame Example**

Hardware Block Chart
Displays the setting of the MG3710A/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.
### Table 3.3.5-1  Keys Available for Creating and Editing Lists and Tables

<table>
<thead>
<tr>
<th>Key name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotary knob</td>
<td>Clockwise Moves the cursor from the left top to the right bottom sequentially.</td>
</tr>
<tr>
<td></td>
<td>Counter clockwise Moves the cursor in reverse to the above.</td>
</tr>
<tr>
<td></td>
<td>Moves the cursor horizontally.</td>
</tr>
<tr>
<td></td>
<td>Moves the cursor vertically.</td>
</tr>
<tr>
<td>Enter key</td>
<td>Opens the setting dialog box of the item selected with the cursor.</td>
</tr>
<tr>
<td>Cancel key</td>
<td>Cancels the entered value and closes the setting dialog box.</td>
</tr>
</tbody>
</table>
### 3.3.6 Resident frame

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

![Figure 3.3.6-1 Resident Frame](image)

<table>
<thead>
<tr>
<th>ARB On/Off information</th>
<th>Power Meter A:</th>
<th>Power Meter B:</th>
<th>BER Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the combination of the waveform memory, CW, AWGN, and others output from ARB.</td>
<td>Disconnected</td>
<td>Off</td>
<td>Stopped</td>
</tr>
<tr>
<td>Rate Mismatch display</td>
<td>Measurement</td>
<td></td>
<td>Sync</td>
</tr>
<tr>
<td>FIR Error display</td>
<td></td>
<td></td>
<td>Measuring</td>
</tr>
<tr>
<td>A: On/Off/Disconnect information/Measured value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: On/Off/Disconnect information/Measured value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>Error Clock ERR (Input clock error)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>Enable ERR (Input enable signal error)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate % display</td>
<td>Sync Loss (Sync Loss occurred)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>Error count</td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td></td>
<td>Measured bits</td>
<td></td>
</tr>
</tbody>
</table>
### 3.3.7 Footer frame

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

![Footer Frame](image)

**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”.

---

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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.

- **Function menu name**
  - Displays the current function menu name.

- **Top key**
  - Press to open the top function menu.

- **Function menu**
  - Maximum 8 menus. Grayed out items cannot be used.
  - Press to display the next page of the Function menu.

- **Back key**
  - Press to go back to the previous layer within the function menu.

- **Page**
  - Indicates the page of the function menu.

![Figure 3.3.8-1 Function Menu](image)

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.

- ![Symbol](image) Press the soft function key to display the function menu on the next layer.

![Figure 3.3.8-2 Function Key with Symbol](image)
Chapter 3 Operation

- 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](image)

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](image)

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

![Figure 3.3.8-5 Function Key with Symbol](image)
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.

![Figure 3.3.9-1 Summary Frame](image_url)

1. Displayed frequency
   
   Displays the specified frequency. The relative display or the value with the offset is displayed.

2. Displayed output level
   
   Displays the specified output. The relative display or the value with the offset is displayed.

3. Output status
   
   Displays the RF output status.
   
   Mod  When it lights green, the RF output signals are modulated.
   
   RF   When it lights orange, the RF signals are output.

4. Alarm
   
   Displays the alarm information of the common indicator only.
3.3.10 RPP

RPP (Reverse Power Protection) is a function to protect the internal circuit of the MG3710A/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/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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Resume SG1 &amp; SG2 RPP</td>
<td>Unblocks signals and recovers to the normal operation if RPP blocks signals.</td>
</tr>
</tbody>
</table>

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
Remote command | Query RPP Status
---|---
**Query** | :OUTPut[1]|2:PROTection:ERRor?

**Response** | <boolean>

**Parameter** | <boolean> RPP Status
---|---
0 | RPP does not block signals.
1 | RPP blocks signals.

**Programming Example**
To query RPP Status of SG1.
OUTP:PROT:ERR?
> 1

Remote command | Query the count of RPP
---|---
**Query** | :OUTPut[1]|2:PROTection:COUNt?

**Response** | <integer> Count of RPP
---|---
Range | 0 to 4294967295 (=2^32 – 1)
Resolution | 1

**Programming Example**
To query the RPP count of SG2.
OUTF2:PROT:COUN?
> 10
# Chapter 3 Operation

## 3.4 Top Function Menu

Press the `` key to display the top function menu.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Frequency</td>
<td>Displays the Frequency function menu. Refer to Chapter 4 “Frequency”</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Level</td>
<td>Displays the Level function menu. Refer to Chapter 5 “Level”</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Sweep/List</td>
<td>Displays the Sweep/List function menu. Refer to Chapter 6 “Sweep/List”</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Mode</td>
<td>Displays the Mode function menu. Refer to Chapter 7 “Modulation”</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Modulation</td>
<td>Turns On/Off the RF signal modulation. When Off is selected, carrier waves (CW) are output. Refer to 3.4.1 “Modulation”</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>RF Output</td>
<td>Enables/disables the RF signal output. Refer to 3.4.2 “RF Output”</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>SG Port</td>
<td>Selects the SG to be controlled. Refer to 3.4.3 “SG Port”</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>AWGN</td>
<td>Displays the AWGN function menu. They are not displayed in MG3740A Refer to 7.5 “AWGN”</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>I/Q</td>
<td>Displays the I/Q function menu. Refer to 7.6 “I/Q Modulation”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Analog/Pulse</td>
<td>Displays the Analog/Pulse function menu. Refer to 7.2 “Analog Modulation: Analog/Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Route Connectors</td>
<td>Displays the Route Connectors function menu. Refer to 7.4 “Route Connectors”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Auxiliary</td>
<td>Displays the Auxiliary function menu. Refer to 9.1 “Auxiliary Function”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Utility</td>
<td>Displays the Utility function menu. Refer to 9.4 “Utility Function”.</td>
</tr>
</tbody>
</table>
3.4 Top Function Menu

3.4.1 Modulation

![Modulation button]

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**

**Toggle On/Off RF signal modulation**

**Command**


**Query**

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

**Response**

<boolean> 0 or 1

**Parameter**

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

**Programming Example**

To turn the modulation On.

OUTP:MOD ON
OUTP:MOD?
> 1
3.4.2 RF Output

**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

or Top>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).
2 Controls SG2.

Remote command
Select SG to be controlled

Command
[:SOURce]:PORT 1|2

Query
[:SOURce]:PORT?

Response
<port>

Parameter
<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/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.

![Figure 3.5.1-2 Numeric Keypad]
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.

Figure 3.5.1-3  Locked Rotary Knob

To increase/decrease a numeric values using arrow keys:
Increase/decrease a numeric value using (← →). 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.

![Figure 3.5.2-1 Character String Input Dialog Box](image)

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.](image)

![Hides the character string input panel.](image)

![Figure 3.5.2-2 Character String Input Panel](image)
3.5 Common Setting Operations

Keys available for character string input are as follows:

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

**Note:**

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.

![File Name Input Dialog Box](image)

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 3.5.2-2 “Keys Available for Character String Input” for keys available for character string input.

**Note:**

- 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 4  Frequency

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.

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  4.1.1 Display description ........................................ 4-3
  4.1.2 Frequency indicator ......................................... 4-4
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4.1 Frequency

When you press Frequency of the main function key or F1 Frequency on the top function menu, the MG3710A/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/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/MG3740A-032)
- 9 kHz to 4000 MHz (With MG3710A/MG3740A-034)
- 9 kHz to 6000 MHz (With MG3710A/MG3740A-036)
- 9 kHz to 2700 MHz (With MG3710A/MG3740A-062/162)
- 9 kHz to 4000 MHz (With MG3710A/MG3740A-064/164)
- 9 kHz to 6000 MHz (With MG3710A/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 Display description

This section describes screens of the frequency information frame.

**Frequency display mode:**
- Display frequency
- Frequency indicator
- RF output frequency

**Channel display mode:**
- Channel
- Channel group number
- Display channel frequency
- RF output frequency

![Figure 4.1.1-1 Frequency Setting Screen](image)

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

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

Items of frequency indicators are as follows:

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>OFFS</code></td>
<td>Offset</td>
<td>Indicates that the frequency offset function is on.</td>
</tr>
<tr>
<td><code>REF</code></td>
<td>Reference</td>
<td>Indicates that the frequency relative value display function is on.</td>
</tr>
<tr>
<td><code>MULT</code></td>
<td>Multiplier</td>
<td>Indicates that the frequency offset multiplier function is on.</td>
</tr>
<tr>
<td><code>OSYN</code></td>
<td>Offset</td>
<td>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.</td>
</tr>
<tr>
<td><code>EXTR</code></td>
<td>Reference</td>
<td>Indicates that an external signal is used as a reference signal source.</td>
</tr>
</tbody>
</table>

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

<status> Synchronization of frequencies
OOS Out of Sync Cannot synchronize frequencies because it 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>

Parameter

<status> Status
When the language mode is SCPI/MG3700:
INT Internal reference signal source
EXT External reference signal source
When the language 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 Example
To query the setting of the reference oscillator.
ROSC:SOUR?
> INT
4.2 Frequency Setting Method: Frequency

When you press Frequency of the main function key or F1 Frequency on the top function menu, the MG3710A/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> Frequency
Range Refer to 4.1 “Frequency”.
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 800 MHz.
FREQ 800MHZ
FREQ?
> 800000000.00
4.2 Frequency Setting Method: Frequency

4.2.1 Frequency setting

Enter numbers in the Frequency dialog box with numeric keypad.

**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.

![Figure 4.2.1-1 Frequency Dialog Box](image)

2. 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.

![Figure 4.2.1-2 Frequency Dialog Box](image)

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”, 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 \( \text{左右} \). The cursor shows the position of the digit.

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.

1. Use the arrow keys \( \text{左右} \) to place the cursor on the digit of 100 kHz.

2. 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.

Figure 4.2.2-1 Frequency Dialog Box
4.2 Frequency Setting Method: Frequency

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

Figure 4.2.3-1 Frequency Dialog Box
4.2.4 Frequency setting resolution

Sets a resolution of arrow keys for setting frequencies.

When the MG3710A/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 setting resolution**

**Command**

```
[:SOURce[1]|2]:FREQuency:STEP[:INCRement] <freq>
```

**Query**

```
[:SOURce[1]|2]:FREQuency:STEP[:INCRement]? 
```

**Response**

```
<freq> Unit: Hz
```

**Parameter**

```
<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**

To set the frequency step level to 200 kHz.

```
FREQ:STEP 200KHZ
FREQ:STEP?
>200000.00
```

**Setting method**

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

Example: To change the frequency with the frequency setting resolution 9 kHz.

1. When the MG3710A/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.
2. Set the numeric value “9” to set the step frequency to 9 kHz.

![Figure 4.2.4-1 Increment Dialog Box](image1)

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

![Figure 4.2.4-2 Increment Dialog Box](image2)

4. Use the arrow keys to increase or decrease the frequency by 9 kHz step.
4.3 Frequency Setting Items

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

Table 4.3-1 Frequency Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Freq Ref</td>
<td>Enables/disables the frequency relative display. Refer to 4.3.1 “Frequency relative display”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Freq Offset</td>
<td>Enables/disables the frequency offset. Refer to 4.3.2 “Frequency offset”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Offset Value</td>
<td>Sets the frequency offset value. Refer to 4.3.2 “Frequency offset”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Freq Multiplier</td>
<td>Enables/disables the frequency offset multiplier. Refer to 4.3.3 “Frequency offset multiplier”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Multiplier Value</td>
<td>Sets the value of the frequency offset multiplier. Refer to 4.3.3 “Frequency offset multiplier”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.000 x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Channel Settings</td>
<td>Displays the channel setting function menu. Refer to 4.4 “Channel Setting”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Freq Sync</td>
<td>Sets the frequency synchronization of SG1 and SG2. Refer to 4.6.1 “Frequency synchronization: Freq Sync”.</td>
</tr>
</tbody>
</table>
### Table 4.3-1 Frequency Function Menu (Cont’d)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>F1</td>
<td>Phase Noise Opt.</td>
<td>Sets the phase noise optimization. Refer to 4.6.2 “Phase noise optimization: Phase Noise Optimize”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;200 kHz &gt;300 kHz</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td>RF Spectrum Normal Reverse</td>
<td>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”.</td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td>Ref Source Auto Int</td>
<td>Sets reference frequency source. Refer to 4.6.4 “Reference oscillator”.</td>
</tr>
<tr>
<td>F4</td>
<td></td>
<td>Ref Freq 10 MHz</td>
<td>Selects a frequency of external reference signal from 5 MHz, 10 MHz, and 13 MHz. Refer to 4.6.4 “Reference oscillator”.</td>
</tr>
<tr>
<td>F5</td>
<td></td>
<td>LO Source Int Ext/Sync</td>
<td>Sets a local signal source. This is available when the MG3710A-017/117 is installed. This is not available in MG3740A. Refer to 4.6.5 “Local signal source”.</td>
</tr>
<tr>
<td>F6</td>
<td></td>
<td>LO Out Off On</td>
<td>Adjusts the phase of a local signal. This is available when the MG3710A-017/117 is installed. This is not available in MG3740A. Refer to 4.6.5 “Local signal source”.</td>
</tr>
<tr>
<td>F7</td>
<td></td>
<td>LO Phase 0.00 deg</td>
<td>Displays the LO Phase screen and adjusts the LO phase. This is not available in MG3740A. Refer to 4.6.5 “Local signal source”.</td>
</tr>
<tr>
<td>F8</td>
<td></td>
<td>Ref Clock Adjustment</td>
<td>Displays the Freq Adjustment function menu and adjusts the frequency of the internal reference frequency signal. Refer to 4.6.6 “Ref Clock Adjustment”.</td>
</tr>
</tbody>
</table>
4.3.1 Frequency relative display: 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

Table 4.3.1-1 Frequency Relative Display Setting Example

<table>
<thead>
<tr>
<th></th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
<th>Example 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output frequency</td>
<td>1.000 GHz</td>
<td>1.000 GHz</td>
<td>1.010 GHz</td>
<td>0.990 GHz</td>
</tr>
<tr>
<td>Frequency relative display</td>
<td>Off</td>
<td>0.00 Hz</td>
<td>10 MHz</td>
<td>−10 MHz</td>
</tr>
<tr>
<td>Displayed frequency</td>
<td>1.000 GHz</td>
<td>0.00 Hz</td>
<td>10 MHz</td>
<td>−10 MHz</td>
</tr>
</tbody>
</table>

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.

Remote command Enable/disable the frequency relative display

Command

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

Query

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

Response

<boolean> 0 or 1

Parameter

<boolean> Frequency relative display On/Off

OFF|0 In absolute values (Default)

ON|1 In relative values
4.3 Frequency Setting Items

**Programming Example**

To enable the frequency relative display.

```plaintext
FREQ:REF:STAT ON
FREQ:REF:STAT?
> 1
```
4.3.2 Frequency offset

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.

<table>
<thead>
<tr>
<th>Output frequency</th>
<th>Example 1</th>
<th>Example 2</th>
<th>Example 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency offset</td>
<td>1.000 GHz</td>
<td>1.000 GHz</td>
<td>1.000 GHz</td>
</tr>
<tr>
<td>Displayed frequency</td>
<td>Off</td>
<td>10 MHz</td>
<td>−10 MHz</td>
</tr>
</tbody>
</table>

Press F2 Freq Ref to toggle On/Off of the frequency offset.

- Off: Does not use the frequency offset (Default).
- On: Uses the frequency offset. The “OFFS” is displayed in the frequency indicator.

Remote command

Enable/disable the frequency offset

Command

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

Query

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

Response

<boolean> 0 or 1

Parameter

<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
4.3 Frequency Setting Items

Frequency Offset Value: 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 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> Offset value
Setting range: –200 GHz to 200 GHz
Resolution: 0.01 Hz
Default: 0 Hz
Suffix code: 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

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.

| Table 4.3.3-1 Frequency Offset Multiplier Setting Example |
|-------------|-----------------|-----------------|
| Example 1   | Example 2       | Example 3       |
| Output frequency | 1.000 GHz      | 1.000 GHz       | 1.000 GHz       |
| Frequency offset multiplier | Off       | 2              | –2              |
| Displayed frequency | 1.000 GHz  | 2.000 GHz      | –2.000 GHz      |

Press **F4 Freq Multiplier** to enable/disable the frequency offset multiplier.

**Off**

Does not use the frequency offset multiplier.

(DefaultValue)

**On**

Uses the frequency offset multiplier. The “MULT” is displayed in the frequency indicator.

**Remote command**

Enable/disable the frequency offset multiplier

**Command**

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

**Query**

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

**Response**

<boolean> 0 or 1

**Parameter**

<boolean> Frequency offset multiplier On/Off

OFF|0 Does not use the frequency offset multiplier.

(DefaultValue)

ON|1 Uses the frequency offset multiplier.
4.3 Frequency Setting Items

**Programming Example**
To enable the frequency offset multiplier.

```
FREQ:MULT:STAT 1
FREQ:MULT:STAT?
> 1
```

**Frequency offset multiplier: Multiplier Value**

Set 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>
```

- 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

When you press Frequency of the main function key or F1 Frequency on the main function menu, the MG3710A/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/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/MG3740A is in the channel setting mode, unless otherwise specified.

Table 4.4-1 Channel Settings Function Menu

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

4.4.1 Frequency/channel display: 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: Frequency display (Default)
Channel: 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

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)

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> Frequency display
OFF|0 Does not display Frequency
ON|1 Displays frequency (Default)

Programming Example
To display the frequency.
SOUR2:FREQ:CHAN:DISP ON
SOUR2:FREQ:CHAN:DISP?
> ON
4.4 Channel Setting

4.4.3 Channel selection: 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>` 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 to place the cursor on the digit to be changed, and use the rotary knob or the arrow keys to specify a number. Rotate the rotary knob to the right or press to increase the channel number. Rotate the rotary knob to the left or press 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 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 Channel Setting

4.4.4 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 to display page 2 and 3.

Setting range 1 to 19

Remote command

Set a channel group

Command

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

Query

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

Response

<ext_integer>

Parameter

<ext_integer> Channel group number
Setting range 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

This function is available only in the channel setting mode.

On the MG3710A/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.

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Name</td>
<td>Channel group name</td>
</tr>
<tr>
<td>Start</td>
<td>The beginning channel number of the channel group</td>
</tr>
<tr>
<td>End</td>
<td>The last channel number of the channel group</td>
</tr>
<tr>
<td>Start Frequency</td>
<td>The beginning channel frequency</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>The interval in frequency between channels</td>
</tr>
</tbody>
</table>
### Table 4.5-2  Channel Table Edit Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Edit Item</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Insert Row</td>
<td>Adds a channel group row above the Channel Table. Refer to 4.5.2 “Adding channel groups: Insert Row”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Delete Row</td>
<td>Deletes one row of Channel Group selected by cursor on Channel Table. Refer to 4.5.3 “Deleting channel groups: Delete Row”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Clear</td>
<td>Clears the data of all channel groups in the Channel Table. Refer to 4.5.4 “Deleting channel groups: Clear”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Open</td>
<td>Recalls the data of the Channel Table. Refer to 4.5.5 “Recalling channel tables: Open”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Save</td>
<td>Saves the data of the Channel Table. Refer to 4.5.6 “Saving channel tables: Save”.</td>
</tr>
</tbody>
</table>
4.5.1 Registering channel groups

Remote command                  Register channel groups
Command
[:SOURce[1]|2]:FREQuency:CHANnels:EDIT
<ext_integer1>,<string>,<ext_integer2>,<ext_integer3>,<freq1>,<freq2>

Parameter
<ext_integer1> Group Number
Setting range 1 to 19
Default 1
<string> Group Name
Character string within 100 characters enclosed by double quotes (“”) or single quotes (’’)
Default Group
<ext_integer2> Start Channel
Setting range 0 to 20000
Resolution 1
Default 0
<ext_integer3> End Channel
The End Channel setting must be larger than the Start Channel setting.
Setting range 0 to 20000
Resolution 1
Default 0
<freq1> Start Frequency
Setting range Refer to 4.1 “Frequency”.
Resolution 0.01 Hz
Default 1 GHz
<freq2> Channel Spacing
Setting range 1 Hz to 999.999999 MHz
Resolution 1 Hz
Default 16 kHz

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 method
The 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

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.

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

Note:
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

Figure 4.5.1-2  Start Number Dialog Box

1. Place the cursor on the “Start” of the first 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.

Figure 4.5.1-3  End Number Dialog Box

5. Place the cursor on the “End” of the first 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.

(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 first 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.

**Figure 4.5.1-5  Channel Spacing Dialog Box**
5. Place the cursor on the “Channel Spacing” of the first row.

6. Press **F1 Edit Item** to display the **Channel Spacing** dialog box in the active function frame.

   - Settable range: 1 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

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**

1. 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.

![Figure 4.5.2-1 Inserted New Row](image)
4.5.3 Deleting channel groups: 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> 
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 once and place the cursor on the “Group” of the 2nd row.
2. 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.

Figure 4.5.3-1 Deleted Channel Group
4.5.4 Deleting channel tables: 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.

Figure 4.5.4-1 Deleted Channel Table
4.5.5 Recalling channel tables: Open

Recalls the saved channel table file.

**Remote command**
Recalls a channel table file

**Command**

**Parameter**
<string>  
File name without an extension  
Character string within 100 characters enclosed by double quotes (" ") or single quotes (’ ’)  
(excluding extension)

<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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Specifies the Drive containing the channel table to recall.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Open</td>
<td>Recalls the channel table file in the folder specified in Drive.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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.
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.

5. Press F7 Open to recall the selected channel table file. Press F8 Cancel to return to the previous screen without recall the channel table file.

Note:

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

Saves a channel table containing the specified parameters.

Remote command

**Save a channel table**

**Command**

```
[<string>,<device>]
```

**Parameter**

- `<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>`: 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 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
```

**Setting method**

The procedure for saving a channel table is as follows:

Example: To name the channel table file currently displayed as “W-LAN” and save it
1. Press **F8 Save** to open the Save function menu.

### Table 4.5.6-1  Channel Table Save Function Menu

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

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.

4. Enter a file name in the **Channel Table Save** dialog box. By default, the “Channel_Date_Additional number” is displayed in the text box.

5. 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.

**Note:**

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\n
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/MG3740A becomes the frequency setting mode. This section assumes that you press Frequency and the MG3710A/MG3740A is in the Frequency Setting mode, unless otherwise specified.

4.6.1 Frequency synchronization: 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/MG3740A-062/064/066/162/164/166 is installed.

<table>
<thead>
<tr>
<th>Table 4.6.1-1 Freq Sync Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Frequency synchronization On/Off: Freq Sync

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

[:SOURce]:FREQuency:SYNC <boolean>

Query

[:SOURce]:FREQuency:SYNC?

Response

<boolean> 0 or 1

Parameter

<boolean> Frequency synchronization

OFF|0  Does not synchronize frequencies (Default)

ON|1  Synchronizes frequencies

Details

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

Programming Example

To synchronize frequencies of SG1 and SG2.

FREQ:SYNC ON
FREQ:SYNC?
> 1
4.6 Frequency-Related Functions

Frequency synchronization: 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 MHz is decreased from the SG2 Port frequency.

**Remote command**

**Set a frequency synchronization mode**

**Command**

```
[:SOURce]:FREQuency:SYNC:MODE PARallel|SYMMetry
```

**Query**

```
[:SOURce]:FREQuency:SYNC:MODE?
```

**Response**

```
<mode> 1 or 0
```

**Parameter**

```
<mode> Frequency synchronization
PARallel Parallel mode (Default)
SYMMetry Symmetry mode
```

**Details**

This is available when the MG3710A/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

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 \( \text{←} \) to switch the function menu to page 2.
Press F1 Phase Noise Opt. to select a character of phase noise.

- **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**

\[:\text{SOUR}ce[1]|2]:\text{FREQuency:SYNThesis[}:\text{STATe}] 1|2

**Query**

\[:\text{SOUR}ce[1]|2]:\text{FREQuency:SYNThesis[}:\text{STATe}]? 

**Response**

\(<\text{mode}>\)

**Parameter**

\(<\text{mode}>\)

- **Character of phase noise**
  - 1: Optimized Close-in Phase noise (Default)
  - 2: Optimized Wide-Offset Phase noise

**Programming Example**

To set the phase noise character of SG2 to Best Wide-Offset Phase noise.

\(\text{SOUR2: FREQ:SYNT} \ 2\)

\(\text{SOUR2: FREQ:SYNT?}\)

\(> \ 2\)
4.6.3 Spectrum reverse: RF Spectrum

You can use the spectrum reverse function when reversed modulation signals must be input, for example evaluating DUT for IF.

In MG3740A, you 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 inverts the spectrum of RF signals. For both the waveform memory A and B, the spectrum is inverted.

Similar to this, F6 Spectrum A and F7 Spectrum B of the ARB Setup function menu on page 2 invert the spectrum of the waveform memory A and the waveform memory B, respectively. Reversing RF Spectrum and Spectrum A or B simultaneously returns the status of output waveform to Normal.

Press \[ \text{F2 RF Spectrum} \] to select spectrum of RF signals.

**Normal**

Does not invert the spectrum of output 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>\n
**Parameter**

\<mode>\n
Whether to invert output waveform

NORMal

Normal: Do not invert (Default)

INVert

Reverse: Invert

**Programming Example**

To invert the output waveform of SG1.

DM: POL INV

DM: POL?

> INV
Chapter 4  Frequency

Figure 4.6.3-1  RF Spectrum: Two Waves Not Added

Figure 4.6.3-2  RF Spectrum: Two Waves Added
4.6 Frequency-Related Functions

4.6.4 Reference oscillator

Reference oscillator: Ref Source

Sets reference frequency source.

Press \( \text{Top} \to \text{Frequency}, > \to \text{Ref Source} \)

Press \( \text{F3 Ref Source} \) 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/MG3740A as the reference frequency source.

Auto Uses the internal frequency source of the MG3710A/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

\[ [:\text{SOURce}]\text{:ROSCillator:SOURce:AUTO} <\text{boolean}> \]

Query

\[ [:\text{SOURce}]\text{:ROSCillator:SOURce:AUTO}? \]

Response

\(<\text{boolean}> \quad 0 \text{ or } 1\)

Parameter

\(<\text{boolean}> \quad \text{Frequency reference signal source}\)

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
External signal frequency: Ref Freq

Set a frequency of external reference signal for the MG3710A/MG3740A.

When an external signal is used for a reference signal source, the frequency of the external signal must be set for the MG3710A/MG3740A.

Press \( \text{Top} \rightarrow \text{F4 Ref Freq} \) to display the Ref Oscillator Freq function menu and select a frequency of the signal from 5 MHz, 10 MHz (default), and 13 MHz.

Remote command

Set a frequency of the external reference signal

Command

\[ [:\text{SOURce}]:\text{ROSCillator}:\text{FREQuency}:\text{EXTernal} <\text{freq}> \]

Query

\[ [:\text{SOURce}]:\text{ROSCillator}:\text{FREQuency}:\text{EXTernal}? \]

Response

\(<\text{freq}> \quad \text{Unit: Hz} \)

Parameter

\(<\text{freq}> \quad \text{Frequency of the external signal} \)

Setting range Either value of 5 MHz, 10 MHz (Default), or 13 MHz

Suffix code \( \text{HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ} \)

When omitted: \( \text{HZ} \)

Programming Example

To set the frequency of the reference frequency signal to 13 MHz.

\[ \text{ROSC:FREQ:EXT 13MHZ} \]

\[ \text{ROSC:FREQ:EXT?} \]

\[ > 13000000 \]
4.6 Frequency-Related Functions

4.6.5 Local signal source

**Local signal source: LO Source**

Sets a Local signal source.

This is available when the MG3710A-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, φM, or Pulse modulation is On, or when the selected waveform setting is Mod=On).

Press `F5 LO Source` to select a signal source.

| Int    | Uses the internal Local signal source (Default). |
| Ext/Sync | 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>

**Parameter**

<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 Uses the Local of SG1. This is available only for SG2.

**Details**

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

![Select the external output of Local signal between On and Off](frequency.png)

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

This is available when the 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, $M, or pulse modulation is On, or when the selected waveform setting is Mod=On).

Note:
When the MG3710A/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/MG3740A output signal EVM is degraded because of reflection.

Press ⇨ 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
4.6 Frequency-Related Functions

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;boolean&gt;</td>
<td>Local signal source</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
</tr>
<tr>
<td>ON</td>
<td>1</td>
</tr>
</tbody>
</table>

Details

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

Programming Example

To externally output Local signals.

LOC:OUT ON
LOC:OUT?
> 1

Local phase adjustment: LO Phase

Adjusts phases of Local signals.

This is not available in MG3740A.

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

Figure 4.6.5-1 LO Phase Dialog Box

Set a phase of RF output.

Setting range: –180.00 deg to 180.00 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.
Remote command  Adjust a phase of Local signals

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

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

Response
<phase>

Parameter
<table>
  <tr><td><phase></td><td>Phase of Local signals</td></tr>
  <tr><td>Setting range</td><td>-180.00 deg to 180.00 deg</td></tr>
  <tr><td>Resolution</td><td>0.01</td></tr>
  <tr><td>Default</td><td>0</td></tr>
</table>

Programming Example
To set a phase of the Local signal to 4.25 deg.
PHAS 4.25
PHAS?
> 4.25
4.6 Frequency-Related Functions

4.6.6 Ref Clock Adjustment

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

Press 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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Reference Clock 0</td>
<td>Adjusts the frequency of the internal reference frequency signal.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Preset Reference Clock</td>
<td>Resets the internal reference frequency signal to factory shipment defaults.</td>
</tr>
</tbody>
</table>

Reference clock frequency: 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
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> Adjustment value
Setting range 0 to 1023
Resolution 1
Default Factory shipment defaults

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

Preset reference clock: Preset Reference Clock

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.
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.

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Output Level</td>
<td>5-2</td>
</tr>
<tr>
<td>5.1.1</td>
<td>Display description</td>
<td>5-3</td>
</tr>
<tr>
<td>5.1.2</td>
<td>Level indicator</td>
<td>5-5</td>
</tr>
<tr>
<td>5.2</td>
<td>Output Level Setting Method: Level</td>
<td>5-7</td>
</tr>
<tr>
<td>5.2.1</td>
<td>Output level setting with numeric keypad</td>
<td>5-9</td>
</tr>
<tr>
<td>5.2.2</td>
<td>Changing output level with rotary knob</td>
<td>5-10</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Changing output level with arrow keys</td>
<td>5-11</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Output level setting resolution</td>
<td>5-12</td>
</tr>
<tr>
<td>5.3</td>
<td>Output Level Setting Item</td>
<td>5-14</td>
</tr>
<tr>
<td>5.3.1</td>
<td>Relative level display: Reference</td>
<td>5-16</td>
</tr>
<tr>
<td>5.3.2</td>
<td>Level offset: Offset</td>
<td>5-19</td>
</tr>
<tr>
<td>5.3.3</td>
<td>Output level limit</td>
<td>5-22</td>
</tr>
<tr>
<td>5.3.4</td>
<td>ATT Hold</td>
<td>5-25</td>
</tr>
<tr>
<td>5.3.5</td>
<td>Level synchronization: Sync</td>
<td>5-27</td>
</tr>
<tr>
<td>5.3.6</td>
<td>Calibrate Level</td>
<td>5-28</td>
</tr>
<tr>
<td>5.3.7</td>
<td>Optimize S/N</td>
<td>5-29</td>
</tr>
<tr>
<td>5.4</td>
<td>User Correction: Correction</td>
<td>5-30</td>
</tr>
<tr>
<td>5.4.1</td>
<td>User correction setting: Configure Correction</td>
<td>5-32</td>
</tr>
<tr>
<td>5.4.2</td>
<td>Edit Item</td>
<td>5-34</td>
</tr>
<tr>
<td>5.4.3</td>
<td>Adding correction data: Insert Row</td>
<td>5-37</td>
</tr>
<tr>
<td>5.4.4</td>
<td>Deleting correction data: Delete Row</td>
<td>5-38</td>
</tr>
<tr>
<td>5.4.5</td>
<td>Deleting correction table: Clear</td>
<td>5-39</td>
</tr>
<tr>
<td>5.4.6</td>
<td>Recalling user correction table: Open</td>
<td>5-40</td>
</tr>
<tr>
<td>5.4.7</td>
<td>Saving user correction table: Save</td>
<td>5-42</td>
</tr>
<tr>
<td>5.5</td>
<td>Use Power Sensor</td>
<td>5-45</td>
</tr>
<tr>
<td>5.5.1</td>
<td>Connection Settings</td>
<td>5-46</td>
</tr>
<tr>
<td>5.5.2</td>
<td>Settings</td>
<td>5-49</td>
</tr>
<tr>
<td>5.5.3</td>
<td>Zero adjustment: Zero Sensor</td>
<td>5-57</td>
</tr>
<tr>
<td>5.5.4</td>
<td>Creating correction table: Create Correction File</td>
<td>5-58</td>
</tr>
</tbody>
</table>
Chapter 5 Output Level

5.1 Output Level

When you press Level of the main function key or F2 Level on the top function menu, the MG3710A/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/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:

<table>
<thead>
<tr>
<th>Table 5.1-1 Output Level Setting Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710A/MG3740A-options</td>
</tr>
<tr>
<td>SG1</td>
</tr>
<tr>
<td>043/143 not installed</td>
</tr>
<tr>
<td>SG2</td>
</tr>
<tr>
<td>042/142</td>
</tr>
<tr>
<td>041/141</td>
</tr>
<tr>
<td>072/172</td>
</tr>
<tr>
<td>071/171</td>
</tr>
<tr>
<td>Setting range</td>
</tr>
<tr>
<td>-110 dBm to +17 dBm</td>
</tr>
<tr>
<td>-144 dBm to +17 dBm</td>
</tr>
<tr>
<td>-110 dBm to +30 dBm</td>
</tr>
<tr>
<td>-144 dBm to +30 dBm</td>
</tr>
<tr>
<td>-110 dBm to +25 dBm</td>
</tr>
<tr>
<td>-144 dBm to +25 dBm</td>
</tr>
<tr>
<td>Output level resolution 0.01 dB</td>
</tr>
</tbody>
</table>

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 Output Level

5.1.1 Display description

This section describes screens of the level information frame.

![Output Level Setting Screen](image)

**Figure 5.1.1-1  Output Level Setting Screen**

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

**Remote command**

**Query the RF output level**

**Query**

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

**Response**

<AMPL> Unit: dBm

**Parameter**

<AMPL> Current output level

Range Depends on the range set in Table 5.1-1 “Output Level Setting Range”.

Resolution 0.01 dB

Default 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 Output Level

5.1.2 Level indicator

Shows the display items of the level indicator.

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

*: 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>` 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`
Remote command  |  Query the status of OSYNC
---|---
Query  |  [:SOURce[1]|2]:POWer:SYNC:ERRor?

Response  |
<status>

Parameter  |
<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 current operation status.
POW:SYNC:ERR?
> NORM

Remote command  |  Query the status of ORNG
---|---
Query  |  [:SOURce[1]|2]:POWer:RANGe:ERRor?

Response  |
<status>

Parameter  |
<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 current operation status.
POW:RANG:ERR?
> NORM
5.2 Output Level Setting Method: 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**

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

**Query**

```
[:SOURce[1]|2]:POWer[:LEVEL][:IMMediate][:AMPLitude]?
```

**Response**

```
<ampl>  Unit: dBm
```

**Parameter**

```
<ampl>  Output level
Range  Output level setting range of MG3710A/MG3740A
Resolution  0.01 dB
Default  Minimum output level of MG3710A/MG3740A
Suffix code  DBM, DM, DBUV, DBUVE

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>
```
Chapter 5  Output Level

Parameter

<table>
<thead>
<tr>
<th>&lt;unit&gt;</th>
<th>Output level unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBM</td>
<td>dBm (Default)</td>
</tr>
<tr>
<td>DBUV</td>
<td>dBV (Termination voltage display)</td>
</tr>
<tr>
<td>DBUVEMF</td>
<td>dBVemf (Open voltage display)</td>
</tr>
</tbody>
</table>

Details

Only the unit changes.

Example of Use

To set the level setting unit to dBVemf (open voltage display).

UNIT:POW DBUVEMF
UNIT:POW?
> DBUVEMF

Remote command

Set the displayed output level with the relative level when the relative level display is On

Command

[:SOURce[1]|2]:POWer:REference:AMPLitude <rel_ampl>

Query

[:SOURce[1]|2]:POWer:REference:AMPLitude?

Response

<rel_ampl> Unit: dB

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_ampl&gt;</th>
<th>Relative output level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output level setting range of</td>
</tr>
<tr>
<td></td>
<td>MG3710A/MG3740A</td>
</tr>
<tr>
<td></td>
<td>0.01 dB</td>
</tr>
<tr>
<td></td>
<td>Minimum output level of MG3710A/MG3740A</td>
</tr>
</tbody>
</table>

Example of Use

To set the relative output to +10.00 dB.

POW:REF:AMPL 10.00DB
POW:REF:AMPL?
> 10.00
5.2 Output Level Setting Method: Level

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.

   ![Figure 5.2.1-1  Level Dialog Box]

2. 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.

   ![Figure 5.2.1-2  Level Dialog Box]

The output level setting allows the setting and display with dBm of the power unit and dBµV (termination voltage display)/dBµVemf (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. The cursor shows the position of the digit.

**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 to place the cursor on the digit of 1 dB (Press twice to move it to 1 dB).

![Figure 5.2.2-1  Level Dialog Box](image)

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 to place the cursor on the digit of 1 dB.
3. Use the arrow keys to increase or decrease the frequency by 1 dB step.
### 5.2.4 Output level setting resolution

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

When the MG3710A/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**

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

**Query**

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

**Response**

```plaintext
<rel_ampl>
```

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;rel_ampl&gt;</td>
<td>Step level</td>
</tr>
<tr>
<td></td>
<td>Range: 0.01 dB to 100 dB</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.01 dB</td>
</tr>
<tr>
<td></td>
<td>Default: 0.1 dB</td>
</tr>
</tbody>
</table>

**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.
2. Set 0.3 dB.

![Increment Dialog Box](image)

**Figure 5.2.4-1 Increment Dialog Box**

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

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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Reference</td>
<td>Enables/disables the level relative display. Refer to 5.3.1 “Relative level display: Reference”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Offset</td>
<td>Off  On</td>
<td>Enables/disables the level offset value. Refer to 5.3.2 “Level offset: Offset”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Offset Value</td>
<td>0.00 dB</td>
<td>Sets the level offset value. Refer to 5.3.2 “Level offset: Offset”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>Limit Level</td>
<td>Off  On</td>
<td>Enables/disables the Limit Level function. Refer to 5.3.3 “Output level limit”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F5</td>
<td>Limit Value</td>
<td>25.00 dBm</td>
<td>Sets the maximum output level. Refer to 5.3.3 “Output level limit”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F7</td>
<td>ATT Hold</td>
<td>Off  On</td>
<td>Sets On/Off of the ATT Hold function. Refer to 5.3.4 “ATT Hold”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F8</td>
<td>Sync</td>
<td>Off  On</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Correction</td>
<td>Enables/disables the User Correction function. 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”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Configure Correction</td>
<td></td>
<td>Opens the User Correction function menu to set the user correction table. Refer to 5.4.1 “User correction setting: Configure Correction”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Calibrate Level</td>
<td></td>
<td>Performs the level calibration. Refer to 5.3.6 “Calibrate Level”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>Optimize S/N</td>
<td>Off  On</td>
<td>Enables/disables the Optimize S/N mode. 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”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 5.3-1  Level Function Menu (Cont’d)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>F6</td>
<td>Start BER Measurement</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Stop BER Measurement</td>
<td>Stops the BER measurement. It is displayed when the BER measurement function option is installed. Refer to Chapter 8 “BER Measurement”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Clear BER Count</td>
<td>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”.</td>
</tr>
</tbody>
</table>
Chapter 5  Output Level

5.3.1 Relative level display: Reference

Enables/disables the relative level display.

The relative level display displays the output level difference from the reference output level.

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

RF output level = display level
       + output level when the relative level display is enabled

Press **F1 Reference** 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.

Remote command  Enable/disable the relative level display

Command
\[:SOURce[1]|2]:POWer:REference:STATe <boolean>

Query
\[:SOURce[1]|2]:POWer:REference:STATe?

Response
<boolean>  0 or 1

Parameter
<boolean>  Output level display
OFF|0       Switches to the absolute value display (Default).
ON|1        Switches to the relative display.

Example of Use
To switch the output level display to the relative display.
POW:REF:STAT ON
POW:REF:STAT?
> 1
Remote command: Query the reference level (output level when the relative level display is set to ON) for relative level display

Query:
[:SOURce[1]|2]:POWer:REFerence?

Response:
<ampl> Unit: dBm

Parameter:
<ampl> Reference level
Range: Output level setting range of MG3710A/MG3740A
Resolution: 0.01 dB
Default: Minimum output level of MG3710A/MG3740A

Example of Use:
To query the reference level for relative output level.
POW:REF?
> -5.00

Setting method:
The relative level setting procedure is as follows.

Example: To increase by 7.5 dB with –47 dBm as the reference.

1. Set the output level to –47 dBm.
2. Press F1 Reference to switch the relative level display to On, and then the relative level display is enabled with –47 dBm of the current output level as the reference. The displayed output level value is changed from “–47.00 dBm” to “+0.00 dB”, and the RF output level (actual output level) is displayed above it. In addition, “REF” is displayed in the level indicator of the screen to indicate the relative level display is enabled.

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 $-47 \text{ dBm} + 7.5 \text{ dB} = -39.5 \text{ dBm}$ as the RF output level.
5.3 Output Level Setting Item

5.3.2 Level offset: Offset

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

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

Parameter
Chapter 5  Output Level

Output level offset On/Off

<table>
<thead>
<tr>
<th>Boolean</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Off (Default)</td>
</tr>
<tr>
<td>ON</td>
<td>On</td>
</tr>
</tbody>
</table>

Example of Use

To set the output level offset to ON.

POW:OFFS:STAT ON
POW:OFFS:STAT?
> 1

Offset level: Offset Value

Sets the output offset level.

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

Setting range: –100 to +100 dB
Resolution: 0.01 dB
Default: 0 dB

Remote command

Set the output offset level

Command

[[:SOURce[1]|2]:POWer[:LEVel][:IMMediate]:OFFSet <rel_ampl>

Query

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

Response

<rel_ampl> Unit: dB

Parameter

<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 Use

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 $-1.7 \text{ dB}$ and output level after offset to be $-47 \text{ dBm}$.

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

   ![Offset Level Setting](image1.png)

   **Figure 5.3.2-2  Offset Level Setting**

2. Press $-1$, $7$, and **F1 dB** to set the offset level to $-1.7 \text{ dB}$.

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 $-47 \text{ dBm}$. The “$-47.00 \text{ dBm}$” is displayed in the displayed output level. At this time, the actual level output from SG is $-45.3 \text{ dBm}$ as shown in the RF output level.

   ![Output Level Confirmation](image2.png)

   **Figure 5.3.2-3  Output Level Confirmation**
5.3.3 Output level limit

Output level limit: Limit Level

Press F4 Limit Level to set the Limit Level function to On/Off. Selecting “On” displays “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 Level function On/Off

**Command**

[:SOURce[1]|2]:POWer:USER:ENABle <boolean>

**Query**

[:SOURce[1]|2]:POWer:USER:ENABle?

**Response**

<boolean> 0 or 1

**Parameter**

<boolean>

- OFF|0: Off (Default)
- ON|1: On

**Example of Use**

To set the Limit Level function to ON.

POW:USER:ENAB ON
POW:USER:ENAB?
> 1
5.3 Output Level Setting Item

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  
RFLLevelMin + LevelOffset + UnitCoef to RFLLevelMax + LevelOffset + UnitCoef (with the output level display)

RFLLevelMax:  
Maximum output level of MG3710A/MG3740A

RFLLevelMin:  
Minimum output level of MG3710A/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 0.01 dB
Default RFLLevelMax + LevelOffset + UnitCoef

Remote command

Set the output level limit value (Limit Level)

Command
[:SOURce[1]|2]:POWer:USER:MAX <ampl>

Query
[:SOURce[1]|2]:POWer:USER:MAX?

Response
<ampl>

Parameter

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

2. Press 1, 0, and F1 dBm to set the Limit Value to 10 dBm.
3. 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.

Figure 5.3.3-1 Output Limit Level
5.3 Output Level Setting Item

5.3.4 ATT Hold

Enable/Disable the ATT Hold function to prevent signal dropout onATT switching.

Press F7 ATT Hold to set 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 adjusts 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

[:SOURce1]|2::POWer:ATTenuation:AUTO <boolean>

Query

[:SOURce1]|2::POWer:ATTenuation:AUTO?

Response

<boolean> 0 or 1
Parameter
<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

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/MG3740A-062/064/162/164/066/166 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>
```

**Query**

```
[:SOURce]:POWer:SYNC:STATe?
```

**Response**

```
<boolean> 0 or 1
```

**Parameter**

```
<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
```
5.3.6 Calibrate Level

Calibrates the output level.
Pressing 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/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

Note:
Execute Calibrate Level while the device to be tested is connected to the RF connector of the MG3710A/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 Output Level Setting Item

5.3.7 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 \( \text{ previous } \) to switch the function menu to the second page, and press \( \text{ F4 Optimize S/N } \) to set the Optimize S/N function to On.

- Off: Distortion characteristic has priority (Default).
- On: S/N has priority.

Remote command

Enables/disables the Optimize S/N function

Command

\[ [:\text{SOURce}\{1\}\{2\}:\text{POWer}:\text{NOISe}][:\text{STATe}] \ <\text{boolean}> \]

Query

\[ [:\text{SOURce}\{1\}\{2\}:\text{POWer}:\text{NOISe}][:\text{STATe}]? \]

Response

\(<\text{boolean}> \quad 0 \text{ or } 1\)

Parameter

\(<\text{boolean}> \quad \text{On/Off of the Optimize S/N function}\)

- OFF|0: Off (Default)
- ON|1: On

Example of Use

To set the Optimize S/N function to ON.

\( \text{POW:NOIS} \ \text{ON} \)
\( \text{POW:NOIS}? \)
\( > 1 \)
5.4 User Correction: 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**

MG3710A/MG3740A

Cable (Attenuation: 1.7 dB)  This level will be displayed.

DUT

Output level after correction: -45.3 dBm  Correction level: 1.7 dB  RF output level: -47 dBm
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.

Remote command

Set the user correction to On/Off

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

Query
[:SOURce[1]|2]:CORRection[:STATe]?

Response
<boolean>  0 or 1

Parameter
<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

Sets the user correction value.

Press \( \text{Level} \) to switch the function menu to the second page, and press F2 \text{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/MG3740A to create the correction table.

Selecting the item to be set with the cursor on the Table and pressing F1 \text{Edit Item} displays the dialog box for setting. For the setting method, refer to 5.4.2 “Edit Item”.

![Correction Table](image)

Figure 5.4.1-1 Correction Table
### Table 5.4.1-1 Correction Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Edit Item</td>
<td>Sets the user correction table correction value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.2 “Edit Item”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Insert Row</td>
<td>Adds the correction value to the user correction table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.3 “Adding correction data: Insert Row”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Delete Row</td>
<td>Deletes the correction value in the user correction table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.4 “Deleting correction data: Delete Row”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Clear</td>
<td>Deletes the user correction table expanded in the memory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.5 “Deleting correction table: Clear”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Use Power Sensor</td>
<td>Displays the Use Power Sensor function menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>They are not displayed when the Power Sensor is not connected.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.5 “Use Power Sensor”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Open</td>
<td>Recalls the saved user correction table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.6 “Recalling user correction table: Open”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Save</td>
<td>Saves the user correction table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.4.7 “Saving user correction table: Save”.</td>
</tr>
</tbody>
</table>
5.4.2 Edit Item

Sets the correction value of the user correction table.

Remote command

Add the correction value to the correction table

Command

[:SOURce[1]|2]:CORRection:FLATness:PAIR <freq>,<rel_ampl>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;freq&gt;</td>
<td>Frequency</td>
</tr>
<tr>
<td>Setting range</td>
<td>Frequency setting range of MG3710A/MG3740A</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 Hz</td>
</tr>
<tr>
<td>Default</td>
<td>1 GHz</td>
</tr>
<tr>
<td>Suffix code</td>
<td>HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ</td>
</tr>
</tbody>
</table>

Handled as HZ when omitted.

<table>
<thead>
<tr>
<th>&lt;rel_ampl&gt;</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting range</td>
<td>–100 dB to +100 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Default</td>
<td>–999.00 (Undefined)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Suffix code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Handled as DB when omitted.</td>
</tr>
</tbody>
</table>

Example of Use

To add 1 GHz of the frequency and 4 dB of the correction value to the correction table.

CORR:FLAT:PAIR 1GHZ, 4
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

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.

2. Confirm that the cursor is at “Frequency”. Press **F1 Edit Item** to display **Frequency** dialog box and **Enter Item** function menu.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Enter Item</td>
<td>Edits values and returns to the previous menu.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>
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

![Figure 5.4.2-2 Correction Level Setting](image)

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

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.

![Figure 5.4.3-1  Adding Correction Data](image-url)
5.4.4 Deleting correction data: Delete Row

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.
5.4.5 Deleting correction table: 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.

![Correction Table](image)

Figure 5.4.5-1 Deleting Correction Table
5.4.6 Recalling user correction table: Open

Recalls the saved user correction table.

Remote command  
Recall the user correction table
Command

<string> [,<device>]

Parameter
<string>  File name without an extension
Character string within 100 characters enclosed
by double quotes (“ ”) or single quotes (’ ’)
(excluding extension)

<device>  Drive number
Options  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 method  
The recalling procedure is as follows.
1. Press F7 Open to open the Recall function menu.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
</table>
| 1    | F1      | Drive C:     | Specifies the Drive containing the user correction
table to recall. |
|      | 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. |

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.
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.

5. Press F7 Open to recall the selected user correction table file. Press F8 Cancel to return to the previous screen without recalling the channel table file.

Note:

- File names are listed in alphanumeric order.
- If no channel table file exists, “File not found” is displayed.
5.4.7 Saving user correction table: 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>
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 “Corr[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>
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\n
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
```
5.4 User Correction: Correction

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.

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

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.

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.
Chapter 5 Output Level

**Note:**

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

The power sensor to be used for the user correction is set.

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

<table>
<thead>
<tr>
<th>Table 5.5-1  USB Power Sensor Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Note: The function menu can also be accessed by selecting **Top⇒Level, ⇒⇒Configure Correction⇒Use Power Sensor**.
5.5.1 Connection Settings

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

### Table 5.5.1-1 PM Connection Function Menu

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

**COM Port setting: 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>
```
5.5 Use Power Sensor

**Parameter**

- `<ext_integer>`: COM Port number
  - Setting range: 2 to 8
  - Resolution: 1
  - Default: 2

**Example of Use**

To set the COM Port number of SG1 power sensor to 8.

```plaintext
CORR:PMET:COMM:USB:PORT 8
CORR:PMET:COMM:USB:PORT?
> 8
```

**Model setting :Model**

- 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.

**Table 5.5.1-2 Model Function Menu**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>MA24104A</td>
<td>600 MHz to 4 GHz</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>MA24105A</td>
<td>350 MHz to 4 GHz</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>MA24106A</td>
<td>50 MHz to 6 GHz (Default)</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>MA24108A</td>
<td>10 MHz to 8 GHz</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>MA24118A</td>
<td>10 MHz to 18 GHz</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>MA24126A</td>
<td>10 MHz to 26 GHz</td>
</tr>
</tbody>
</table>

**Note:**

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> Power sensor model name
Options 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
5.52 Settings

[Level] or Top>Level, Configure Correction>Use Power Sensor>Settings

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

Table 5.5.2-1  Settings Function Menu

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

Start Freq 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

<table>
<thead>
<tr>
<th>Power Sensor</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MG3710A/MG3740A Options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>032/062/162</td>
</tr>
<tr>
<td>MA24104A</td>
<td>600 MHz</td>
<td>2.7 GHz</td>
</tr>
<tr>
<td>MA24105A</td>
<td>350 MHz</td>
<td>2.7 GHz</td>
</tr>
<tr>
<td>MA24106A</td>
<td>50 MHz</td>
<td>2.7 GHz</td>
</tr>
<tr>
<td>MA24108A</td>
<td>10 MHz</td>
<td>2.7 GHz</td>
</tr>
<tr>
<td>MA24118A</td>
<td>10 MHz</td>
<td>2.7 GHz</td>
</tr>
<tr>
<td>MA24126A</td>
<td>10 MHz</td>
<td>2.7 GHz</td>
</tr>
</tbody>
</table>

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> In 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.
5.5 Use Power Sensor

Example of Use
To set the start frequency to 600 MHz.
CORR:FLAT:STEP:STAR 600MHZ
CORR:FLAT:STEP:STAR?
> 600000000.00

Stop Freq

[Level] or [Top>Level, > Configure Correction>Use Power Sensor>Settings>Stop Freq]
Sets the stop frequency when the correction table is created with the power sensor.

Press [F2 Stop Freq] in the Settings function menu to display the Stop Freq dialog box in the active function frame. Enter the numbers and press the unit key 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 frequency

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

Query
[:SOURce[1]|2]:CORRection:FLATness:STEP:STOP?

Response
<freq> Unit: Hz

Parameter
<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 frequency to 5 GHz.
CORR:FLAT:STEP:STOP 5GHZ
CORR:FLAT:STEP:STOP?
> 5000000000.00


**Chapter 5  Output Level**

### Level Offset

Enable 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**

\[ [:SOURce[1]|2]:CORRection:PMETer:GAIN2:STATe \texttt{<boolean>} \]

**Query**

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

**Response**

\[ \text{<boolean>} \quad 0 \text{ or } 1 \]

**Parameter**

\[ \text{<boolean>} \quad \text{On/Off of the level offset} \]

\[ \text{OFF\textbar}0 \quad \text{Off (Default)} \]

\[ \text{ON\textbar}1 \quad \text{On} \]
Example of Use
To set the level offset to ON.
CORR:PMET:GAIN2:STAT ON
CORR:PMET:GAIN2:STAT?
> 1

Level Offset Value

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][:MAGNitude] <rem_ampl>

Query
[:SOURce[1]|2]:CORRection:PMETer:GAIN2[:INPut][:MAGNitude]?

Response
<rem_ampl>

Parameter
<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

Sets the measurement point number when the correction table is created with the power sensor.

The measurement point interval is by the following:

\[(\text{Start frequency} – \text{stop frequency}) / (\text{correction point} – 1)\]

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

**Set the measurement point number**

**Command**

\[[:\text{SOUR}ce[1]|2]:\text{CORRection:FLATness:STEP:POINts} <\text{ext_integer}>\]

**Query**

\[[:\text{SOUR}ce[1]|2]:\text{CORRection:FLATness:STEP:POINts}\]

**Response**

\[<\text{ext_integer}>\]

**Parameter**

\[<\text{ext_integer}>\]

- 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

Pressing **F6 Averaging** 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>
```

**Query**

```
[:SOURce[1]|2]:CORRection:PMETer:AVERage[:STATe]? 
```

**Response**

```
<boolean> 0 or 1
```

**Parameter**

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

**Example of Use**

To set the averaging for SG2 power sensor measurement to On.

```
SOUR2:CORR:PMET:AVER ON
SOUR2:CORR:PMET:AVER?
> 1
```
Averaging Count

Set 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 to 2048
Resolution 1
Default 10

Remote command

Set the averaging count

Command
[:SOURce[1]|2]:CORRection:FMETer:AVERage:COUNt
<ext_integer>

Query
[:SOURce[1]|2]:CORRection:FMETer:AVERage:COUNt?

Response
<ext_integer>

Parameter
<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:FMET:AVER:COUN 1024
SOUR2:CORR:FMET:AVER:COUN?
> 1024
5.5.3 Zero adjustment: 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/MG3740A is Off during the adjustment. Also keys other than the power key are disabled.

CAUTION

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

2. Enter the information of the connected power sensor with ComPort number and Model to the MG3710A/MG3740A.

3. Set the MG3710A/MG3740A RF Output to Off.
   Press F4 Zero Sensor to execute the zero adjustment for the power sensor.
5.5.4 Creating correction table: 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> 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/MG3740A.
Also connect the RF Input terminal of the power sensor to the end of the path to be corrected.

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

2. 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.
3. 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.
4. Set the path loss/gain between the MG3710A/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/MG3740A to the level of the test target.
5. Press **F6 Create Correction File** in the USB Power Sensor function menu to output the CW signal from the MG3710A/MG3740A and sweep frequency between Start Frequency and Stop Frequency. The signal is received by the power sensor, and the difference from the MG3710A/MG3740A output level is created as the correction table.

6. Save the created Correction Table according to 5.4.7 “Saving user correction table: Save”.
Chapter 6  Sweep/List

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.

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6.1 Sweep/List Function

MG3710A/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.

**Note:**

The Sweep function cannot be executed for SG1 and SG2 simultaneously.

The analog modulation (AM/FM/\(\phi\)M) 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/List Info Dialog Box](image)

Figure 6.1.1-1  Sweep/List Info Dialog Box (Sweep Type : “Sweep”)
6.1 Sweep/List Function

Figure 6.1.1-2 Sweep/List Info Dialog Box (Sweep Type: “List”)

Table 6.1.1-1 Sweep/List Info Display Items

<table>
<thead>
<tr>
<th>type</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep/List</td>
<td>Sweep</td>
<td>Indicates items, frequency (Freq), and level (Lvl) to execute the Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>Sweep Type</td>
<td>Distinguishes the Sweep function (Sweep) and List function (List).</td>
</tr>
<tr>
<td></td>
<td>Frequency Start</td>
<td>Display start frequency of the Sweep function</td>
</tr>
<tr>
<td></td>
<td>Frequency Stop</td>
<td>Display stop frequency of the Sweep function</td>
</tr>
<tr>
<td></td>
<td>Level Start</td>
<td>Display start level of the Sweep function</td>
</tr>
<tr>
<td></td>
<td>Level Stop</td>
<td>Display stop level of the Sweep function</td>
</tr>
<tr>
<td></td>
<td>Step Points</td>
<td>Sweep point number on the Sweep function</td>
</tr>
<tr>
<td>List</td>
<td>Step Points</td>
<td>Number of sweep points for List function</td>
</tr>
<tr>
<td></td>
<td>Dwell Types</td>
<td>Distinguishes the reference Sweep/List of DwellTime on the List function.</td>
</tr>
<tr>
<td>Sweep/List</td>
<td>Manual Mode</td>
<td>Distinguishes Automatic (Off) and Manual (On) for the operation to move to the next sweep point.</td>
</tr>
<tr>
<td></td>
<td>Sweep Direction</td>
<td>Distinguishes the Up/Down of the execution order of the Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>Sweep Repeat</td>
<td>Distinguishes the Continuous (Cont)/Once (Single) of the Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>Point Trigger</td>
<td>Distinguishes the point trigger On/Off and Start/Point trigger.</td>
</tr>
<tr>
<td></td>
<td>Point Trigger Source</td>
<td>Distinguishes the External (Ext)/Key (Key)/Remote command (Bus)/Timer (Timer) of point trigger source</td>
</tr>
<tr>
<td></td>
<td>Current Point</td>
<td>Indicates the sweep point/ the number of sweep points being executed.</td>
</tr>
<tr>
<td></td>
<td>Step Dwell</td>
<td>Indicates the output dwell time on Sweep/List function. Displayed when Dwell Type is Sweep.</td>
</tr>
</tbody>
</table>

The following are remote commands for items displayed in the Sweep/List Info dialog box.
Recalling sweep point being executed: Current Point

This command recalls the sweep point being executed.

Remote command  
Query the current sweep point
Query

[:SOURce]:SWEep:CPOint?
[:SOURce]:LIST:CPOint?

Response

Parameter

Sweep point being executed

Programming Example
To recall the sweep point being executed.
SWE:CPO?
> 100

Recalling sweep point number: Current Point

The sweep point number is recalled.

Remote command  
Recall the sweep point number
Query

[:SOURce]:LIST:POINts?

Response

Parameter

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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Sweep Display Off</td>
<td>Opens the Sweep Mode function menu and sets the execution of Sweep/List function. Refer to 6.2.1 “Setting operation item: Sweep”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Sweep Type Sweep List</td>
<td>Selects the Sweep function or List function. Refer to 6.2.2 “Sweep Type”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Sweep Repeat Cont Single</td>
<td>Sets the operation count for Sweep/List function to Single/Continuous. Refer to 6.2.3 “Sweep Repeat”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Start Sweep/Stop Sweep</td>
<td>Starts and stops the Sweep/List function. Refer to 6.2.4 “Start/Stop Sweep”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Sweep Direction Up Down</td>
<td>Sets the direction of execution order for Sweep/List function. Refer to 6.2.5 “Sweep Direction”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Configure Step Sweep</td>
<td>Displays the Sweep function menu and executes the Sweep function-related settings. Refer to 6.3 “Sweep Function”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Configure List Sweep</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Point Trigger</td>
<td>Displays the Point Trigger function menu and sets the trigger. Refer to 6.5 “Point Trigger”.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Manual Mode Off On</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Manual Point 1</td>
<td>Sets the sweep point manually on Sweep function and List function. Refer to 6.2.6 “Manual mode”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Sweep Out Status</td>
<td>Displays the Sweep Out function menu and sets the signal output from the SweepOut terminal. Refer to 6.2.7 “Sweep Out”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Trigger Out Polarity Positive Negative</td>
<td>Sets the polarity of Point Trigger Out signal. Refer to 6.2.8 “Trigger Out Polarity”.</td>
</tr>
</tbody>
</table>
6.2.1 Setting operation item: Sweep

or Top>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 **Sweep/List** function menu.

Example:

Freq + Lvl  To execute the Sweep function or List function for Freq (frequency) and Lvl (level)

<table>
<thead>
<tr>
<th>Table 6.2.1-1  Sweep Mode Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Setting all Sweep/List function to Off: Off

or Top>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

or Top> 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> 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
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Sweep/List function for level: Level

Sweep/List function for output level.

Press **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>`: 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

or Top> Sweep/List, > Sweep Type

Selects the Sweep function or List function.

Press F2 Sweep Type to select.

Sweep Step Sweep function (Default)
List List 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 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

Selects the operation count for the Sweep/List function from Continuous/Single.

Press **F3 Sweep Repeat** to select.

- **Cont** Continuous (Default)
- **Single** Once (Single)

Remote command

**Select the operation count for the Sweep/List function from Continuous/Single**

**Command**

:INITiate:CONTinuous[[:ALL]] <boolean>

**Query**

:INITiate:CONTinuous[[:ALL]]?

**Response**

<boolean> 0 or 1

**Parameter**

<boolean> Repetition count

- OFF|0 Once (Single)
- ON|1 Continuous (Default)

**Programming Example**

To set the sweep count to Continuous.

```
INIT:CONT ON
INIT:CONT?
> 1
```

6.2.4 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.
6.2 Setting Item

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

Sets the execution order for Sweep/List function.
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:DIRection?

Response
<direction> UP or DOWN

Parameter
<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 order to Up.
LIST:DIR UP
LIST:DIR?
> UP
6.2.6 Manual mode

Sets the method to move to the next point on Sweep function and List function.

Manual Mode

Sets the method to move to the next point 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> 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
6.2 Setting Item

Manual Point

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

<table>
<thead>
<tr>
<th>Set the sweep point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Command</strong></td>
</tr>
<tr>
<td>[:SOURce]:LIST:MANual &lt;ext_integer&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Query</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:LIST:MANual?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Response</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;ext_integer&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Parameter</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;ext_integer&gt;</td>
</tr>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Refer to the above description.</td>
</tr>
<tr>
<td>Default</td>
</tr>
<tr>
<td>Refer to the above description.</td>
</tr>
</tbody>
</table>

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** Outputs the sweep position with 0 to 10 V.
- **Sweep Status** Outputs the identifying signal for sweeping and non-sweeping (Default).

![10 V Sweep Signal](image1)

**Figure 6.2.7-1 10 V Sweep Signal**

![Sweep Status](image2)

**Figure 6.2.7-2 Sweep Status**
<table>
<thead>
<tr>
<th>Remote command</th>
<th>Select the SweepOut terminal output format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Command</strong></td>
<td>:ROUTe[:CONNectors]:OUTPut:SOUT SWEep</td>
</tr>
<tr>
<td><strong>Query</strong></td>
<td>:ROUTe[:CONNectors]:OUTPut:SOUT?</td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td>&lt;mode&gt; SWE or SETT</td>
</tr>
<tr>
<td><strong>Parameter</strong></td>
<td>&lt;mode&gt; Output signal</td>
</tr>
<tr>
<td></td>
<td>SWEep 10 V Sweep Signal</td>
</tr>
<tr>
<td></td>
<td>SETTled Sweep Status (Default)</td>
</tr>
</tbody>
</table>

**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

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  Positive polarity (Default)
Negative  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>  Signal polarity
POSitive  Positive polarity (Default)
NEGative  Negative polarity
**Programming Example**

To set the signal polarity to negative.

TRIG:OUTP:FOL NEG

TRIG:OUTP:FOL?

> NEG
Chapter 6  Sweep/List

6.3 Sweep Function

6.3.1 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Freq Start (1.00000000000) GHz</td>
<td>Sets the start frequency of the Sweep function.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Freq Stop (1.00000000000) GHz</td>
<td>Sets the stop frequency of the Sweep function.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Level Start (-144.00) dBm</td>
<td>Sets the start level of the Sweep function.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Level Stop (-144.00) dBm</td>
<td>Sets the stop level of the Sweep function.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Points (101)</td>
<td>Sets the point number on the Sweep function.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Dwell Time (2.000) ms</td>
<td>Sets the dwell time at each point on the Sweep function execution.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Step Shape (\text{SawTooth}) Triangle</td>
<td>Selects the normal sweep or triangle sweep on the Sweep function.</td>
</tr>
</tbody>
</table>
6.3 Sweep Function

Sweep start frequency: Freq Start

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/MG3740A.
Resolution
0.01 Hz
Default
1 GHz

Remote command
Set the start frequency of the Sweep function

Command
[:SOURce[1]|2]:FREQuency:STARt <freq>

Query
[:SOURce[1]|2]:FREQuency:STARt?

Response
Unit: Hz

Parameter
Start frequency

Programming Example
To set the start frequency to 800 MHz.
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.

Range: Same as the frequency setting range of MG3710A/MG3740A.
Resolution: 0.01 Hz
Default: 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> Stop frequency
Range Depends on the frequency setting range of MG3710A/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?
> 1800000000.00
6.3  Sweep Function

Related command
This command sets the sweep center frequency of the Sweep function. Using this command with the command to set the span frequency sets the start and stop frequencies as a result. This is a function only with remote commands.

Remote command  Set the sweep center frequency of the Sweep function
Command
[:SOURce[1]|2]:FREQuency:CENTer <freq>
Query
[:SOURce[1]|2]:FREQuency:CENTer? [MAXimum|MINimum]
Response
<freq>
  MAXimum  Maximum settable frequency of MG3710A/MG3740A
  MINimum  Minimum settable frequency of MG3710A/MG3740A (9 kHz)
  Omitted  Center frequency
Parameter
<freq>  Sweep center frequency
Range  Depends on the frequency setting range of MG3710A/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]:FREQuency:SPAN <freq>

Query

[:SOURce[1]|2]:FREQuency:SPAN? [MAXimum|MINimum]

Response

<freq>

  MAXimum  Maximum settable frequency span
           (Maximum settable frequency of
            MG3710A/MG3740A – 9 kHz)

  MINimum  Minimum settable frequency (0 Hz)

  Omitted  Sweep span frequency

Parameter

<freq>  Sweep span frequency

Range  Depends on the frequency setting range of
       MG3710A/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 800MHZ
FREQ:SPAN?
> 800000000.00
Sweep start level: Level Start

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/MG3740A.

**Resolution**
- 0.01 dB

**Default**
- Same as the output level initial value of MG3710A/MG3740A.

**Remote command**

Set the start output level of the Sweep function

**Command**

\[
[:SOURce[1]|2]:POWer:STARt <ampl>
\]

**Query**

\[
[:SOURce[1]|2]:POWer:STARt?
\]

**Response**

\(<ampl>\)

Unit: dBm

**Parameter**

\(<ampl>\)

Start output level

**Range**
- Same as the output level setting range of MG3710A/MG3740A

**Resolution**
- 0.01 dB

**Default**
- Same as the output level initial value of MG3710A/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

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/MG3740A

**Resolution**
- 0.01 dB

**Default**
- Same as the output level initial value of MG3710A/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>`  Unit: dBm

**Parameter**

- `<ampl>`  Stop output level
- **Range**
  - Same as the output level setting range of MG3710A/MG3740A
- **Resolution**
  - 0.01 dB
- **Default**
  - Same as the output level initial value of MG3710A/MG3740A

**Programming Example**

To set the sweep stop output level to –50.00 dBm.

`POW:STOP -50.00`

`POW:STOP?`

`> -50.00`
6.3 Sweep Function

Sweep points: Points

Press F5 Points to display the Points dialog box in the active function frame. Set the point number.

**Range**
- Minimum value: 2
- Maximum value: 1000
- Normal sweep: 500
- Triangle sweep: 500

**Resolution**: 1
**Default**: 101

**Figure 6.3.1-5 Points Dialog Box**

**Remote command**

Set the point number on the Sweep function

**Command**

```
[:SOURce[1]|2]:SWEep:POINts <value>
```

**Query**

```
[:SOURce[1]|2]:SWEep:POINts?
```

**Response**

```
[value]
```

**Parameter**

```
[value]
```
- Point number

**Range**
- Minimum value: 2
- Maximum value: 1000
- Normal sweep: 500
- Triangle sweep: 500

**Resolution**: 1
**Default**: 101

**Programming Example**

To set the point number to 300.

```
SWE:POIN 300
SWE:POIN?
> 300
```
Chapter 6  Sweep/List

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 μs
Default: 2 ms

![Figure 6.3.1-6  Dwell Time Dialog Box](image)

**Remote command**

**Set 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>  
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.

SWEep:DWEL 200US
SWEep:DWEL?
> 0.000200
6.3 Sweep Function

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: Normal sweep (Default)
Triangle: 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 | Command  
[:SOURce[1]|2]:SWEep:SHAPe <shape>
Query | Query  
[:SOURce[1]|2]:SWEep:SHAPe?
Response | Response  
<shape>
Parameter | Parameter  
<shape> | Sweep shape  
SAWTooth | Normal sweep (Default)  
TRIangle | Triangle sweep

Programming Example
To set the sweep shape to the triangle sweep.
SWE:SHAP TRI  
SWE:SHAP?  
> TRI
6.4 List Function: Configure Step Sweep

or Top>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 ListTable function menu and List Table.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>The function displayed on <strong>F1</strong> depends on the cursor position on List Table.</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Edit Item</td>
<td>Displays when the cursor is on SG of the List Table. Select SG to be applied. Refer to 6.4.1 “List Table setting”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SG SG1 SG2</td>
<td>Displays the row where the cursor is positioned in the list. Refer to 6.4.2 “Inserting/deleting row for List Table”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insert Row</td>
<td>Insert Row</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delete Row</td>
<td>Delete Row</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>Clear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dwell Type</td>
<td>Dwell Type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sweep List</td>
<td>Sweep List</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open</td>
<td>Displays the Recall List Table function menu and recalls the List Table data. Refer to 6.4.4 “Recalling List Table: Open”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Save</td>
<td>Displays the Save List Table function menu and saves the List Table. Refer to 6.4.5 “Saving List Table: Save”.</td>
</tr>
</tbody>
</table>
6.4.1 List Table setting

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.

SG setting: SG

or Top>Sweep/List, >Configure List Sweep>SG

When the cursor is on “SG”, F1 key is “SG”. Press F1 SG to select SG to apply List Table.

SG1 Targets SG1. (Default)

SG2 Targets SG2.

Remote command

Set SG1 and SG2 specifying the list number

Command

[:SOURce]:LIST:SOURce:SPECify <integer>,1|2

Query

[:SOURce]:LIST:SOURce:SPECify? <integer>

Response

<SG> 1 or 2
### 6.4 List Function: Configure Step Sweep

#### Parameter

<table>
<thead>
<tr>
<th>&lt;integer&gt;</th>
<th>List number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>1 to 500</td>
</tr>
<tr>
<td>Resolution</td>
<td>1</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
</tr>
<tr>
<td>&lt;SG&gt;</td>
<td>SG number</td>
</tr>
<tr>
<td>1</td>
<td>SG1 (Default)</td>
</tr>
<tr>
<td>2</td>
<td>SG2</td>
</tr>
</tbody>
</table>

#### Programming Example

To set SG2 to the list number 20.

```plaintext
LIST:SOUR:SPEC 20,2
LIST:SOUR:SPEC? 20
> 2
```

Setting frequency: Edit Item

- or **Top>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.

#### Remote command

**Set the frequency specifying the list number**

**Command**

```
[:SOURce]:LIST:FREQuency:SPECify <integer>,<freq>
```

**Query**

```
[:SOURce]:LIST:FREQuency:SPECify? <integer>
```
Response
<freq> Unit: Hz

Parameter
<integer> List number
Range 1 to 500
Resolution 1
Default 1
<freq> Frequency
Range Depends on the frequency setting range of MG3710A/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
> 800000000
6.4 List Function: Configure Step Sweep

Setting Level: Edit Item

When the cursor is on “Level”, F1 key is “Edit Item”. Press F1 Edit Item to display the Level dialog box in the active function frame. Set the level.

Range: Same as the output level setting range of MG3710A/MG3740A
Resolution: 0.01 dB
Default: Same as the output level initial value of MG3710A/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> List number
Range: 1 to 500
Resolution: 1
Default: 1
<ampl> Output level
Range: Output level setting range of MG3710A/MG3740A
Resolution: 0.01 dB
Default: Minimum output level of MG3710A/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**

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**: 100 μs to 16 s
- **Resolution**: 1 μs (990 ns)
- **Default**: 2 ms

![Dwell Dialog Box](image)

**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
```
6.4 List Function: Configure Step Sweep

Parameter

- `<integer>` List number
- Range 1 to 500
- Resolution 1
- Default 1
- `<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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of SG</th>
<th>Frequency</th>
<th>Dwell Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SG1</td>
<td>F1</td>
<td>1 ms</td>
</tr>
<tr>
<td>2</td>
<td>SG1</td>
<td>F2</td>
<td>2 ms</td>
</tr>
<tr>
<td>3</td>
<td>SG1</td>
<td>F3</td>
<td>3 ms</td>
</tr>
<tr>
<td>4</td>
<td>SG1</td>
<td>F4</td>
<td>4 ms</td>
</tr>
<tr>
<td>5</td>
<td>SG1</td>
<td>F5</td>
<td>5 ms</td>
</tr>
</tbody>
</table>

Table 6.4.1-1 Setting Example of Dwell Time

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).

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of SG</th>
<th>Frequency</th>
<th>Dwell Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SG1</td>
<td>F1</td>
<td>1ms</td>
</tr>
<tr>
<td>2</td>
<td>SG2</td>
<td>F2</td>
<td>2ms</td>
</tr>
<tr>
<td>3</td>
<td>SG1</td>
<td>F3</td>
<td>3ms</td>
</tr>
<tr>
<td>4</td>
<td>SG1</td>
<td>F4</td>
<td>4ms</td>
</tr>
<tr>
<td>5</td>
<td>SG2</td>
<td>F5</td>
<td>5ms</td>
</tr>
</tbody>
</table>

Because Element2 targets SG2, the signal of SG1 keeps being output.
Because Element5 targets SG2, the signal of SG1 keeps being output.

Because Element3 targets SG1, the signal of SG2 keeps being output.
Because Element3 targets SG1, the signal of SG2 keeps being output.

![Figure 6.4.1-6 Dwell Time Operation (2SG)](image-url)
6.4 List Function: Configure Step Sweep

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

Press F2 or Top>Sweep/List, >Configure List Sweep>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.

![List Table](image)

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;integer&gt;</td>
<td>Position for the row to be inserted</td>
</tr>
<tr>
<td>Range</td>
<td>1 to the sweep point number</td>
</tr>
<tr>
<td></td>
<td>The last row when omitted</td>
</tr>
<tr>
<td>Resolution</td>
<td>1</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
</tr>
</tbody>
</table>

Programming Example

To add a new row above the 10th row.

`LIST:TYPE:LIST:INS 10`
Deleting row from List Table: Delete Row

Press F3 Delete Row to delete the row where the cursor is positioned and existed rows are replaced up by one row.

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> 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

Press F4 Clear to delete all rows of List Table.
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

Selects the Dwell Time used on the List function.

Press **F6 Dwell Type** to switch List/Sweep.

List  
Applies the Dwell Time in List. (Default)

Sweep  
Applies the Dwell Time set with the Sweep function menu.

**Remote command**

Select the dwell time applied on the List function

**Command**

[:SOURce]:LIST:DWELL:TYPE LIST|STEP

**Query**

[:SOURce]:LIST:DWELL:TYPE?

**Response**

<type> LIST or STEP

**Parameter**

<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 List Function: Configure Step Sweep

6.4.4 Recalling List Table: Open

Recalls the saved List Table file.

Remote command

Recall the saved List Table file

Command

:MMEMory:LOAD:LIST <string>[,<device>]

Parameter

<string>
File name without an extension
Character string within 100 characters enclosed by double quotes (" ") or single quotes ('') (excluding extension)

<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 Recall Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Opens the Device function menu for selection of Device where List Table to be recalled is saved.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Open</td>
<td>Recalls the List Table file in Device selected with F1 Drive.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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.
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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.

*Note:*

File names are listed in alphanumeric order.

If no List Table file exists, “File not found” is displayed.
### 6.4.5 Saving List Table: Save

**Remote command**

Save the List Table with set parameters

**Command**

```
:MMEMory:STORe:LIST [<string>[,<device>]]
```

**Parameter**

- `<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>`: 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\ListTable\n  ```
  - 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 method

Example: 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 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.

| Table 6.4.5-1 List Table Save Function Menu |
|---|---|---|---|
| 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. |
|      | F7    | Save     | Saves the file to the Device selected with F1 Drive. |
|      | F8    | Cancel   | Returns to the previous 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.

4. 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.

**Note:**

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\n```

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

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.

Table 6.5-1  Point Trigger Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Point Trigger On/Off</td>
<td>Enables/disables the trigger on Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Mode Start/Point</td>
<td>Selects the trigger mode on Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Source Ext</td>
<td>Displays the Point Trigger Source function menu and sets the trigger source on Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Delay 0.00000000 s</td>
<td>Sets the delay time from Point Trigger input to hardware settings on Sweep/List function.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Edge Rise/Fall</td>
<td>Sets the polarity to be triggered for External PointTriggerSource.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Timer Period 1.000 ms</td>
<td>Sets the timer trigger period.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Trigger Key</td>
<td>Executes Point Trigger if the key is pressed when Source is Trigger Key.</td>
</tr>
</tbody>
</table>
6.5  Point Trigger

Point Trigger

Enables/disables the trigger on Sweep/List function.
Press F1 Point Trigger to switch the trigger On/Off.

Off        Does not use the trigger (Default).
On         Uses 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>  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

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|POINts

**Query**

`[:SOURce]:LIST:TRIGger:MODE?`

**Response**

`<mode>` STAR or POIN

**Parameter**

`<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

**Figure 6.5-1  Start Trigger**
6.5 Point Trigger

Trigger source: Source

or Top>Sweep/List, >Point Trigger>Source

Sets the trigger source on Sweep/List function.

Press F3 Source to display 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:TRIGger:SOURce BUS|EXTernal|KEY|TIMer

Query

[:SOURce]:LIST:TRIGger:SOURce?

Response

<source> BUS, EXT, KEY or TIM

Parameter

<source> Trigger source
BUS Remote command
EXTernat External input (PatternTrigger1) (Default)
KEY Trigger key F8 Trigger Key
TIMer Trigger with the internal timer
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**Programming Example**
To set the trigger source to the internal timer.
LIST:TRIG:SOUR TIM
LIST:TRIG:SOUR?
> TIM

**Trigger delay: Delay**

- or Top> Sweep/List, > 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**
Set the delay time from the Point Trigger input

**Command**
[:SOURce]:LIST:TRIGger:DELay <time>

**Query**
[:SOURce]:LIST:TRIGger:DELay?

**Response**
<time>  Unit: s

**Parameter**
- <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

**Programming Example**
To set the delay time from the Point Trigger input to 200 μs.
LIST:TRIG:DEL 200US
LIST:TRIG:DEL?
> 0.00020000
Trigger edge: 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>  POS or NEG

Parameter
<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

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 μs
Default 1 ms

Remote command

Set the timer trigger period
Command
:TRIGger[:SEQuence]:TIMer <time>

Query
:TRIGger[:SEQuence]:TIMer?

Response

Parameter

<time>  Timer trigger period
Range 500 μs to 4000 s
Resolution 1 μs
Default 1 ms
Suffix code 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

Generates the trigger manually.
When the trigger source is set to Trigger Key, press **F8 Trigger Key** to allow manual generation of the trigger.
Chapter 7  Modulation

This chapter describes the operations and input/output signal settings related to the modulation function of MG3710A/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.

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7.1 Setting Digital Modulation Analysis

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.

![Outline of MG3710A/MG3740A modulation circuit](image)

**Figure 7.1-1  Outline of MG3710A/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.
### Table 7.1-1  Digital modulation Setup State and Signal Output

<table>
<thead>
<tr>
<th>Settings</th>
<th>Output Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/Q Src</td>
<td>I/Q Out</td>
</tr>
<tr>
<td>Internal, Analog I/Q In</td>
<td>RF</td>
</tr>
<tr>
<td>Analog I/Q In</td>
<td>On</td>
</tr>
<tr>
<td>Internal</td>
<td>Analog I/Q Out</td>
</tr>
<tr>
<td>Analog I/Q In</td>
<td>On</td>
</tr>
<tr>
<td>Internal</td>
<td></td>
</tr>
</tbody>
</table>

* 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.
### Table 7.1.1-1 Hardware Block Chart Display Details

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARB On/Off</td>
<td>ARB block</td>
<td>Indicates On/Off of ARB (function to generate modulated signals with arbitrary waveform patterns).</td>
</tr>
<tr>
<td></td>
<td>Out:</td>
<td></td>
<td>Indicates On/Off of the arbitrary waveform pattern output.</td>
</tr>
<tr>
<td>2</td>
<td>AWGN On</td>
<td>AWGN block</td>
<td>Indicates On/Off of AWGN addition.</td>
</tr>
<tr>
<td>3</td>
<td>Analog Mod AM+FM</td>
<td>Analog Modulation block</td>
<td>Indicates the analog modulation (AM/FM/φM) during modulation.</td>
</tr>
<tr>
<td></td>
<td>I/Q Src:Internal/Analog I/Q In Out: RF/Analog I/Q Out</td>
<td>I/Q block</td>
<td>Indicates the I/Q signal source.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Indicates the output destination for baseband signals.</td>
</tr>
<tr>
<td>4</td>
<td>Local Oscillator Src: Int/Ext/Sync Out: ---/On/Off</td>
<td>Local Oscillator block</td>
<td>Indicates On/Off of the Local signal external output.</td>
</tr>
<tr>
<td>5</td>
<td>Pulse Mod On</td>
<td>Pulse Modulation block</td>
<td>Indicates On/Off of Pulse modulation.</td>
</tr>
<tr>
<td>7</td>
<td>---</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>8</td>
<td>---</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>9</td>
<td>---</td>
<td></td>
<td>Indicates the RF Output is On.</td>
</tr>
<tr>
<td>10</td>
<td>Analog I/Q Out</td>
<td></td>
<td>Indicates the Analog I/Q signal is set to the external output.</td>
</tr>
</tbody>
</table>
Table 7.1.1-1  Hardware Block Chart Display Details (Cont’d)

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td></td>
<td>Analog I/Q In</td>
<td>Indicates the Analog I/Q signal is set to the external input.</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>LO In (For SG1)</td>
<td>Indicates the SG1 Local signal source is set to Ext (input from the rear LO Input connector).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SG1 (For SG2)</td>
<td>Indicates the SG2 Local signal source is set to Sync and the signal is input from SG1.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>SG2 (For SG1)</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LO Out (For SG2)</td>
<td>Indicates the Local signal external output setting (output from the rear LO Output connector) is On.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>---</td>
<td>Click to switch Hardware Block Chart and ARB Info display. The switching button appears only in the MG3740A with option-020/120 installed. Refer to 7.3.1 “ARB”.</td>
</tr>
</tbody>
</table>
Remote command

Query the pattern playback status

Query

[:SOURce[1]|2]:RADio:ARB:REGister[:STATus]?

Response

<status>

Parameter

<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.

<table>
<thead>
<tr>
<th>No</th>
<th>Function</th>
<th>Display Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARB status</td>
<td>On</td>
<td>Indicates On/Off of the ARB function.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>On: ARB On</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off: ARB Off</td>
</tr>
<tr>
<td>2</td>
<td>Output waveform status</td>
<td>A+B</td>
<td>Indicates the status of output waveform.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CW: CW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A: Outputs the waveform pattern of Memory A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B: Outputs the waveform pattern of Memory B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A+B: Outputs the waveform patterns of Memory A and Memory B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A+AWGN: Outputs the waveform pattern of Memory A and AWGN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B+AWGN: Outputs the waveform pattern of Memory B and AWGN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiplex: Outputs the Multiplex waveform.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Long: Outputs the Long waveform.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seq.(A): Outputs the Sequence waveform (Only Memory A is used).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seq.(A+B): Outputs the Sequence waveform (Add Pattern is added).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seq.(A+AWGN): Outputs the Sequence waveform (AWGN is added).</td>
</tr>
</tbody>
</table>
### Table 7.1.1-2  Resident Display Frame ARB (Cont’d)

<table>
<thead>
<tr>
<th>No</th>
<th>Function</th>
<th>Display Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Rate Mismatch display</td>
<td>Rate Mismatch</td>
<td>Displays the Rate Mismatch information. This is displayed when the rate matching is unavailable due to internal operation clock limitation of the MG3710A/MG3740A. Refer to Figure 7.3.2-6 “Rate Matching Function”.</td>
</tr>
<tr>
<td>4</td>
<td>FIR Error display</td>
<td>FIR Error</td>
<td>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/MG3740A.</td>
</tr>
</tbody>
</table>

**Note:**

For Add Pattern, refer to 4.8.2 “Combination File Edit screen” in *MG3700A/3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).*
Chapter 7  Modulation

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/MG3740A.

With the Internal FIR function, the signal to which the FIR filter is applied can be output within the MG3710A/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

Executes the analog modulation (AM/FM/ϕM) for modulated signals created by CW signal or ARB. In addition, when additional analog modulation input option (MG3710A/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/MG3740A, a missing signal/alias may occur. When AM modulation, FM modulation, or ϕM modulation is executed, be careful that the bandwidth used does not to exceed the modulation bandwidth.

- The analog modulation (AM/FM/ϕM) cannot be used during Sweep/List.

- The FM modulation and ϕM modulation cannot be executed simultaneously. Other combinations can be executed simultaneously.

- When additional analog modulation input option (MG3710A/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.
### Table 7.2-1 Analog Pulse Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>AM</td>
<td>Displays the AM function menu to set the settings related to AM (amplitude) modulation. Refer to 7.2.1 “AM Modulation: AM”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>FM/φM</td>
<td>Displays the FM/φM function menu to set the settings related to FM (frequency) modulation/φM (phase) modulation. Refer to 7.2.2 “FM/φM”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pulse</td>
<td>Displays the Pulse function menu to set the settings related to Pulse modulation. Refer to 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Optimize Spurious Distortion</td>
<td>Selects Spurious Mode or Distortion Mode to optimize analog modulation. Refer to 7.2.4 “Optimize Function for the Analog Modulation: Optimize”.</td>
</tr>
</tbody>
</table>
7.2.1 AM modulation: 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/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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>AM1 Setup</td>
<td>Sets the AM1.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>AM2 Setup</td>
<td>Sets the AM2. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
</tbody>
</table>

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.
## Table 7.2.1-2 AM Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>AM Off On</td>
<td>Enables/disables the AM (amplitude) modulation.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>AM Depth Type Lin Exp</td>
<td>Selects the AM modulation application type.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>AM Depth (Lin) 0.1 %</td>
<td>Sets the AM modulation depth with the linear value.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>AM Depth (Log) 3.00 dB</td>
<td>Sets the AM modulation depth with the Log value.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>AM Rate 400.0 Hz</td>
<td>Sets the AM modulation frequency.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Setup AM Source</td>
<td>Sets the AM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Phase Adjust 0.0 deg</td>
<td>Adjusts the phase of internal AM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
</tbody>
</table>
AM Modulation On/Off: AM

Enables/disables AM (amplitude) modulation.

Press F1 AM on the AM1 Setup (AM2 Setup) Function Menu to turn on/off.

- Off: Disables AM Modulation (Default).
- On: Enables AM Modulation.

Remote command To enable/disable AM Modulation

Command


Query

[:SOURce[1]|2]:AM[1]|2:STATe?

Response

<boolean> 0 or 1

Parameter

<boolean> AM Modulation On/Off
OFF|0 Disables AM Modulation (Default).
ON|1 Enables AM Modulation.

Programming Example

To set the AM Modulation to On.

AM:STAT ON
AM:STAT?
> 1

AM Depth Type: 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> Type
LINear Linear format (Default)
EXPonential Exponential format

Programming Example:

To set the AM modulation application type to the linear format.

AM:TYPE LIN
AM:TYPE?
> LIN

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.

$$A \times (1 + \frac{\text{AMDepth}}{100})$$

![Figure 7.2.1-1  AM Modulation (Lin)](image)

Remote command

Set the AM modulation depth with the linear value

Command

```
[:SOURce[1]|2]:AM[1]|2[:DEPTh][:LINear] <percent>
```

Query

```
[:SOURce[1]|2]:AM[1]|2[:DEPTh][:LINear]?
```

Response

```
<percent>  Unit: 
```

Parameter

```
<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)

AM Depth (Log) or Top> Analog>Pulse> AM> AM1 Setup (AM2 Setup),

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)](image)

**Remote command**

Set the AM modulation depth with the Log value

**Command**

```
[:SOURce[1]|2]:AM[1]|2[:DEPTh]:EXPonential <rel_ampl>
```

**Query**

```
[:SOURce[1]|2]:AM[1]|2[:DEPTh]:EXPonential?
```

**Response**

```
<rel_ampl>       Unit: dB
```

**Parameter**

- **<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
Chapter 7  Modulation

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

*AM or Top>Analogue/Pulse>AM>AM1 Setup (AM2 Setup),

**AM Rate**
Sets the AM modulation frequency.

Press **F5 AM Rate** on the AM1 Setup (AM2 Setup) function menu to set with the **AM Rate** dialog box.

This cannot be set when the external modulation signal is selected (**Ext** is selected in the AM source).

Range 0.1 Hz to 50 MHz
Resolution 0.1 Hz
Default 400 Hz

Remote command  
**Set the AM modulation frequency**

**Command**

**Query**

**Response**

<freq> Unit: Hz

**Parameter**

<freq> AM modulation frequency
Range 0.1 Hz to 50 MHz
Resolution 0.1 Hz
Default 400 Hz
Suffix code HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ
When omitted: HZ
7.2 Analog Modulation: Analog/Pulse

Programming Example
To set the AM modulation frequency to 500 Hz.
AM: INT: FREQ 500
AM: INT: FREQ?
> 500.0

Setup AM Source

Setup AM Source
Sets the AM modulation signals.

This is available only when additional analog modulation input option (MG3710A/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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>AM Source</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Int Ext</td>
<td>Switches the internal modulation signal/external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Waveform</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sine</td>
<td>Selects the waveform of the internal modulation signal. This can be select when Int is selected in the AM source.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Coupling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>DC AC</td>
<td>Sets the DC coupling or AC coupling for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Impedance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>600 Ω</td>
<td>Sets the termination for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Ext DC Cal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adjusts the DC offset for the external modulation signal.</td>
</tr>
</tbody>
</table>

Note:
Because the external modulation signal has terminating resistance, some voltage may be generated even if the coupling is set to AC.
Chapter 7  Modulation

Switching AM Source: AM Source

Setup AM Source, AM Source
Switches the AM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F1 AM Source on the Setup AM Source function menu for selection.

Int   Internal modulation signal (Default)
Ext   External modulation signal

Remote command
Switch the AM modulation signal

Command

Query
[:SOURce[1]|2]:AM[1]|2:SOURce?

Response
<type>    INT or EXT

Parameter
<type>    Type
    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 AM modulation signal to the external modulation signal.
AM:SOUR  EXT
AM:SOUR?  >  EXT
7.2 Analog Modulation: Analog/Pulse

AM Waveform: Waveform

Selects the waveform of the internal modulation signal.

This is available only when additional analog modulation input option (MG3710A/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

Select the waveform of the internal AM modulation signal

Command

SINE|TRIangle|SQUare|RAMP

Query


Response

<type> SINE,TRI,SQU,RAMP

Figure 7.2.1-3 Type of Analog Waveform
Parameter
<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
POSitive|NEGative

Query

Response
<type> POS,NEG

Parameter
<type> waveform
  POSitive Positive Ramp (Default)
  NEGative Negative Ramp

Programming Example
To set the shape of the ramp wave to the negative ramp.

AM:INT:FUNC:SHAP RAMP
AM:INT:FUNC:SHApe:RAMP NEG
AM:INT:FUNC:SHAP:RAMP?
> NEG
Coupling: Coupling

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/MG3740A-050/080/150/180) is installed.

Press **F6 Coupling** on the Setup AM Source function menu for selection.

<table>
<thead>
<tr>
<th>DC</th>
<th>DC coupling (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>AC coupling</td>
</tr>
</tbody>
</table>

**Remote command**

Set the DC coupling or AC coupling for the external modulation signal

**Command**

[:SOURce[1]|2]:EXTMod:COUPling DC|AC

**Query**

[:SOURce[1]|2]:EXTMod:COUPling?

**Response**

<type> DC, AC

**Parameter**

<type> Coupling

<table>
<thead>
<tr>
<th>DC</th>
<th>DC coupling (Default)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>AC coupling</td>
</tr>
</tbody>
</table>

**Programming Example**

To set the DC coupling for the external modulation signal.

EXTM:COUP DC

EXTM:COUP?

> DC
Impedance: Impedance

Setup AM Source, Impedance

Sets the termination for the external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F7 Impedance on the Setup AM Source function menu for selection.

50 Ω  50 Ω termination
600 Ω  600 Ω termination (Default)
Hi-Z   High impedance (100 kΩ/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>  Termination
50  50 Ω termination
600  600 Ω 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
Chapter 7  Modulation

Ext DC Cal: Ext DC Cal

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/MG3740A-050/080/150/180) is installed.

This can be used when in the modulation output status (setting either AM, FM, 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
- M = On and M Source = Ext in M1 Setup
- M = On and M Source = Ext in 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

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**

```
<phase>
```

**Query**

```
```

**Response**

```
<phase>   Unit: deg
```

**Parameter**

```
<phase>  Phase of internal AM modulation signal
  Range  –180 deg to +180 deg
  Resolution  0.1 deg
  Default  0 deg
  Suffix code  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
```
Chapter 7  Modulation

7.2.2 FM/φM

Sets the settings related to FM (frequency) modulation or φM (phase) modulation.

Press FM/φM on the main function menu or F2 FM/φM on the Analog Mod function menu to open the FM/φM 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.

Table 7.2.2-1  FM/φM Function Menu

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>FM/φM1 Setup</td>
<td>Sets the FM/φM1.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>FM/φM2 Setup</td>
<td>Sets the FM/φM2. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
</tbody>
</table>

Press FM/φM1 Setup (FM/φM2 Setup) on the AM function menu to open the FM/φM1 (FM/φM2) 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>
2. Set the φM modulation to On with F1 φM.
3. Set the φM deviation angle with F2 φM Deviation.
4. Set the φM modulation frequency with F3 φM 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 φM modulation.
### Table 7.2.2-2 FM/ϕM1 Setup / FM/ϕM2 Setup Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>FM Off On</td>
<td>Enables/disables the FM (Frequency Modulation).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FM Deviation 1.0000 kHz</td>
<td>Sets the FM frequency deviation.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>FM Rate 400.0 Hz</td>
<td>Sets the FM modulation frequency.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Setup FM Source</td>
<td>Sets the FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Phase Adjust 0.0 deg</td>
<td>Adjusts the phase of internal FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>ϕM Off On</td>
<td>Sets the ϕM (phase modulation) On/Off.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>ϕM Deviation 1.0000 rad</td>
<td>Sets the ϕM deviation angle.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>ϕM Rate 400.0 Hz</td>
<td>Sets the ϕM modulation frequency.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Setup ϕM Source</td>
<td>Sets the ϕM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Phase Adjust 0.0 deg</td>
<td>Adjusts the phase of internal FM modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.</td>
</tr>
</tbody>
</table>
FM modulation On/Off: FM

Press \texttt{F1 FM} on the FM/\phi M1 Setup (FM/\phi M2 Setup) function menu to set On/Off.

- Off: Disables FM Modulation (Default).
- On: Enables FM Modulation.

The FM modulation cannot be set to On at the same time with the \phi M modulation.

**Remote command**

**Enable/disable the FM modulation**

**Command**

\[
[:\text{SOURce[1]|2}]:\text{FM[1]|2}:\text{STATe} \ <\text{boolean}> 
\]

**Query**

\[
[:\text{SOURce[1]|2}]:\text{FM[1]|2}:\text{STATe}? 
\]

**Response**

\[
<\text{boolean}> \quad 0 \text{ or } 1 
\]

**Parameter**

\[
<\text{boolean}> \quad \text{FM Modulation On/Off} 
\]

- OFF|0: Disables FM Modulation (Default).
- ON|1: Enables FM Modulation.

**Programming Example**

To set the FM modulation to On.

\[
\text{FM:STAT ON} \\
\text{FM:STAT?} \\
> 1 
\]
7.2 Analog Modulation: Analog/Pulse

**FM Deviation**

The FM frequency deviation is set.

Press **F2 FM Deviation** on the FM/\(M\) Setup (FM/\(M\)2 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 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 *1*2
  the maximum is the smallest of the three.

**Resolution**

0.1 Hz

**Default**

1 kHz (FM/\(M\)1)

0 Hz (FM/\(M\)2)

*1: FM Deviation (FM/\(M\)2) is the frequency deviation of FM/\(M\)2 available when MG3710A/MG3740A-050/150/080/180 is installed.

*2: FM Deviation (FM/\(M\)1) + FM Deviation (FM/\(M\)2) \(\leq\) 40 MHz

*3: FM Rate + FM Deviation \(\leq\) 50 MHz

*4: FM Rate + FM Deviation \(\leq\) 5 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**

```
\begin{center}
\begin{tikzpicture}
\begin{axis}[
    xlabel=\text{time},
    ylabel=\text{freq},
    domain=-5:5,
    samples=100,
    axis lines=middle,
]
\addplot [domain=-2.5:2.5,samples=100,dashed] {sin(deg(\x*180)};
\addplot [domain=-2.5:2.5,samples=100,dashed] {sin(deg(\x*180-90)};
\addplot [domain=-2.5:2.5,samples=100,dashed] {sin(deg(\x*180+90)};
\end{axis}
\end{tikzpicture}
\end{center}
```
Remote command  Set the FM frequency deviation

Command

Query
[:SOURce[1]|2]:FM[1]|2[:DEViation]?

Response
<freq>  Unit: Hz

Parameter
<freq>  FM frequency deviation
Range
When FM Waveform is Sine:
   0 Hz to (40 MHz – 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

Sets the FM modulation frequency.

Press F3 FM Rate on the FM/ϕM1 Setup (FM/ϕM2 Setup) function menu 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

*1: FM Rate + FM Deviation \(\leq 50 \text{ MHz} \)
*2: FM Rate + FM Deviation \(\leq 5 \text{ MHz} \)

**Remote command**

**Set the FM modulation frequency**

**Command**

\[
[:\text{SOUR}ce[1]|2]:\text{FM}[1]|2:\text{INTernal}:\text{FREQuency} <\text{freq}>
\]

**Query**

\[
[:\text{SOUR}ce[1]|2]:\text{FM}[1]|2:\text{INTernal}:\text{FREQuency}?\]

**Response**

\(<\text{freq}>\)

**Parameter**

\(<\text{freq}>\) 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
Chapter 7  Modulation

Programming Example
To set the FM modulation frequency to 500 Hz.
FM: INT:FREQ 500
FM: INT:FREQ?
> 500.0

Setup FM Source

Setup FM Source (FM/φM1 Setup), Setup FM Source
Sets the FM modulation signals.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F4 Setup FM Source on the FM/φM1 Setup (FM/φM2 Setup) function menu to open the Setup FM Source function menu.

Table 7.2.2-3  Setup FM Source Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>FM Source Int Ext</td>
<td>Switches the internal modulation signal/external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Waveform Sine</td>
<td>Selects the waveform of the internal modulation signal. This can be selected when Int is selected in the FM source.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Coupling DC AC</td>
<td>Sets the DC coupling or AC coupling for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Impedance 600 Ω</td>
<td>Sets the termination for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Ext DC Cal</td>
<td>Adjusts the DC offset for the external modulation signal.</td>
</tr>
</tbody>
</table>

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

Switches the FM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F1 FM Source on the Setup FM Source function menu for selection.

- **Int**: Internal modulation signal (Default)
- **Ext**: External modulation signal

**Remote command**

**Switch the FM modulation signal**

**Command**

```
```

**Query**

```
[:SOURce[1]|2]:FM[1]|2:SOURce?
```

**Response**

```
<type> INT or EXT
```

**Parameter**

```
<type>
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
```
Chapter 7  Modulation

FM Waveform: Waveform

Selects the waveform of the internal modulation signal.

This is available only when additional analog modulation input option (MG3710A/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**

```
SINE|TRIangle|SQUare|RAMP
```

**Query**

```
```

**Response**

```
<type> SINE,TRI,SQU,RAMP
```

**Parameter**

```
<type> waveform
  SINE Sine (Default)
  TRIangle Triangle
  SQUare Square
  RAMP Ramp
```

**Programming Example**

To set the waveform of the internal FM modulation signal to the Triangle.

```
FM:INT:FUNC:SHApe TRI
FM:INT:FUNC:SHApe?
> TRI
```
### 7.2 Analog Modulation: Analog/Pulse

**Remote command**

Select the shape of the ramp wave

**Command**

```
POSitive|NEGative
```

**Query**

```
```

**Response**

```
<type> POS,NEG
```

**Parameter**

```
<type> waveform
   POSitive      Positive Ramp (Default)
   NEGative      Negative Ramp
```

**Programming Example**

To set the shape of the ramp wave to the negative ramp.

FM:INT:FUNC:SHA RAMP
FM:INT:FUNC:SHA:RAMP NEG
FM:INT:FUNC:SHA:RAMP?
> NEG

### Coupling: Coupling

![AM or Top> Analog/Pulse>FM/PM>FM/PM1 Setup (FM/PM2 Setup)>Setup FM Source, Coupling](image)

Sets the DC coupling or AC coupling for the external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press **F6 Coupling** on the Setup FM Source function menu for selection.

<table>
<thead>
<tr>
<th>DC</th>
<th>AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC coupling (Default)</td>
<td>AC coupling</td>
</tr>
</tbody>
</table>

**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**

```
<type> DC,AC
```
Chapter 7  Modulation

Parameter
<type>    Coupling
    DC  DC coupling (Default)
    AC  AC coupling

Programming Example
To set the DC coupling for the external modulation.

EXTM:COUP DC
EXTM:COUP?
> DC

Impedance: Impedance

Sets the termination for the external modulation signal.
This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F7 Impedance on the Setup FM Source function menu for selection.

50 Ω  50 Ω termination
600 Ω  600 Ω termination (Default)
Hi-Z   High impedance (100 kΩ/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>    Termination
    50  50 Ω termination
    600  600 Ω 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

(AM) or Top > Analog/Pulse > FM/ϕM > FM/ϕM1 Setup
(FM/ϕM2 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/MG3740A-050/080/150/180) is installed.

This can be used when in the modulation output status (setting either AM, FM, ϕM, 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 ϕM1 Setup
- ϕM = On and ϕM Source = Ext in ϕM2 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

Adjusts a phase of internal FM modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press **F5 Phase Adjust** on the FM/\(\phi M1\) Setup (FM/\(\phi M2\) 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 FM modulation signal

**Command**

```
<phase>
```

**Query**

```
```

**Response**

```
<phase>    Unit: deg
```

**Parameter**

```
<phase>    Phase of internal FM modulation signal

Range      –180 deg to +180 deg
Resolution 0.1 deg
Default    0 deg
Suffix code DEG, 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
```
7.2 Analog Modulation: Analog/Pulse

ϕM modulation On/Off: ϕM

Enables/disables the ϕM (phase) modulation.

Press F1 ϕM in the second page of the FM/ϕM1 Setup (FM/ϕM2 Setup) function menu to set On/Off.

Off Disables ϕM Modulation (Default).
On Enables 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> 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
Chapter 7  Modulation

ϕM Deviation

Sets the ϕM deviation angle.

Press F2 ϕM Deviation in the second page of the FM/ϕM Setup (FM/ϕM2 Setup) function menu to set with the ϕM Deviation dialog box.

Range

- When ϕM Waveform is Sine:
  - 0 rad to 160 rad, or \((40 \text{ MHz} \div \text{ϕM Rate}) \text{ rad}\), whichever smaller*1
- When ϕM Waveform is other than Sine:
  - 0 rad to 160 rad, or \((4 \text{ MHz} \div \text{ϕM Rate}) \text{ rad}\), whichever smaller*2

Resolution 0.001 rad
Default 0 rad

*1: \(\text{ϕM Rate} \times \text{ϕM Deviation} \leq 40 \text{ MHz}\)
*2: \(\text{ϕM Rate} \times \text{ϕM Deviation} \leq 4 \text{ MHz}\)

When the ϕM modulation is executed for the CW signal, the signal below is created.

![Diagram of ϕM Modulation](image)

**Figure 7.2.2-2  ϕM Modulation**

Remote command

Set the ϕM deviation angle

**Command**

```
```

**Query**

```
[:SOURce[1]|2]:PM[1]|2[:DEViation]?
```

**Response**

```
<ext_numeric>  Unit: rad
```
### 7.2 Analog Modulation: Analog/Pulse

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt;\text{ext_numeric}&gt;) (\phi) M deviation angle</td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td></td>
</tr>
<tr>
<td>(\phi) M Waveform is Sine: &amp; 0 rad to 160 rad, or ((40 \text{ MHz} \div \phi) M Rate) rad, whichever smaller(^1)</td>
<td></td>
</tr>
<tr>
<td>(\phi) M Waveform is other than Sine: &amp; 0 rad to 160 rad, or ((4 \text{ MHz} \div \phi) M Rate) rad, whichever smaller(^2)</td>
<td></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.001 rad</td>
</tr>
<tr>
<td><strong>Default</strong></td>
<td>0 rad</td>
</tr>
<tr>
<td><strong>Suffix code</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

**Programming Example**

To set the \(\phi\) M frequency deviation to 50 rad.

```plaintext
PM 50
PM?
> 50.000
```

\(\phi\) M modulation frequency: \(\phi\) M Rate

Set the \(\phi\) M modulation frequency.

Press **F3 \(\phi\) M Rate** in the second page of the FM/\(\phi\) M1 Setup (FM/\(\phi\) M2 Setup) function menu to set with the \(\phi\) M Rate dialog box.

**Range**

| \(\phi\) M Waveform is Sine: & 0.1 Hz to 40 MHz, or \((40 \text{ MHz} \div \phi\) M Deviation\) MHz, whichever smaller\(^1\) |
| \(\phi\) M Waveform is other than Sine: & 0.1 Hz to 4 MHz, or \((4 \text{ MHz} \div \phi\) M Deviation\) MHz, whichever smaller\(^2\) |
| **Resolution**   | 0.1 Hz      |
| **Default**      | 400 Hz      |

\(^1\): \(\phi\) M Rate \(\times\) \(\phi\) M Deviation \(\leq\) 40 MHz

\(^2\): \(\phi\) M Rate \(\times\) \(\phi\) M Deviation \(\leq\) 4 MHz
Chapter 7  Modulation

Remote command  Set the \( \phi \text{M} \) modulation frequency

Command

\[ [:\text{SOURce[1]|2]}:PM[1]|2:INTernal:FREQuency \ <freq> \]

Query


Response

\(<freq>\)  Unit: Hz

Parameter

\(<freq>\)  \( \phi \text{M} \) modulation frequency

Range

When \( \phi \text{M} \) Waveform is Sine:
- 0.1 Hz to 40 MHz,
- or \((40 \text{ MHz} \div \phi \text{M} \text{ Deviation}) \text{ MHz}\), whichever smaller

When \( \phi \text{M} \) Waveform is other than Sine:
- 0.1 Hz to 4 MHz,
- or \((4 \text{ MHz} \div \phi \text{M} \text{ Deviation}) \text{ MHz}\), 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 \( \phi \text{M} \) modulation frequency to 500 Hz.

PM:INT:FREQ 500
PM:INT:FREQ?
> 500.0
Setup $\phi$M Source

Sets the $\phi$M modulation signals.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F4 Setup $\phi$M Source in the second page of the FM/$\phi$M1 Setup (FM/$\phi$M2 Setup) function menu to open the Setup $\phi$M Source function menu.

Table 7.2.2-4 Setup $\phi$M Source Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>$\phi$M Source Int Ext</td>
<td>Switch the internal modulation signal/external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Waveform Sine</td>
<td>Selects the waveform of the internal modulation signal. This can be selected when Int is selected in the $\phi$M source.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Coupling DC AC</td>
<td>Sets the DC coupling or AC coupling for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Impedance 600 $\Omega$</td>
<td>Sets the termination for the external modulation signal.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Ext DC Cal</td>
<td>Adjusts the DC offset for the external modulation signal.</td>
</tr>
</tbody>
</table>

Note:

Because the external modulation signal has terminating resistance, some voltage may be generated even if the coupling is set to AC.
Switching $\phi$M Source: $\phi$M Source

- **Top** or **Analog/Pulse**-$\phi$M-$\phi$M M Setup
- **FM/$\phi$M Setup**-$\phi$M Source, $\phi$M $\phi$M

Switches the $\phi$M modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press **F1 $\phi$M Source** on the Setup $\phi$M Source function menu for selection.

**Int** Internal modulation signal (Default)

**Ext** External modulation signal

**Remote command**

**Switch the $\phi$M modulation signal**

**Command**

```
[:SOURce[1]|2]:PM[1]|2:SOURce INT|INT1|INT2|EXT
```

**Query**

```
[:SOURce[1]|2]:PM[1]|2:SOURce?
```

**Response**

```
<type> INT or EXT
```

**Parameter**

```
<type> Type
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 $\phi$M modulation signal to the external modulation signal.

**PM:SOUR** EXT

**PM:SOUR?**

> EXT
7.2 Analog Modulation: Analog/Pulse

ϕM Waveform: Waveform

Selects the waveform of the ϕM internal modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F2 Waveform on the Setup ϕM Source function menu for selection. This can be set when Int is selected in the ϕM 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 ϕM modulation signal

Command
SINE|TRIangle|SQUare|RAMP

Query

Response
<type> SINE,TRI,SQU,RAMP

Parameter
<type> waveform
SINE Sine (Default)
TRIangle Triangle
SQUare Square
RAMP Ramp

Programming Example

To set the waveform of the internal ϕM modulation signal to the Triangle.
PM:INT:FUNC:SHAP TRI
PM:INT:FUNC:SHAP?
> TRI
Remote command

Select the shape of the ramp wave

Command

POSitive|NEGative

Query


Response

<type> POS,NEG

Parameter

<type> waveform
POSitive Positive Ramp (Default)
NEGative Negative Ramp

Programming Example

To set the shape of the ramp wave to the negative ramp.

PM:INT:FUNC:SHA RAMP
PM:INT:FUNC:SHA:RAMP NEG
PM:INT:FUNC:SHA:RAMP?
> NEG

Coupling: Coupling

Sets the DC coupling or AC coupling for the external modulation signal. This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F6 Coupling on the Setup $\phi$M Source,Coupling 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

<type> DC,AC
7.2 Analog Modulation: Analog/Pulse

Parameter

<table>
<thead>
<tr>
<th>&lt;type&gt;</th>
<th>Coupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>DC coupling (Default)</td>
</tr>
<tr>
<td>AC</td>
<td>AC coupling</td>
</tr>
</tbody>
</table>

Programming Example

To set the DC coupling for the external modulation.

```plaintext
EXTM:COUP DC
EXTM:COUP?
> DC
```

Impedance: Impedance

Set the termination for the external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press F7 Impedance on the Setup φM Source function menu for selection.

- 50 Ω: 50 Ω termination
- 600 Ω: 600 Ω termination (Default)
- Hi-Z: High impedance (100 kΩ/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

<table>
<thead>
<tr>
<th>&lt;type&gt;</th>
<th>Termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>50 Ω termination</td>
</tr>
<tr>
<td>600</td>
<td>600 Ω termination (Default)</td>
</tr>
<tr>
<td>Hi-Z</td>
<td>High impedance (100 kΩ/70 pF)</td>
</tr>
</tbody>
</table>

Programming Example

To set the 50 Ω termination for the external modulation signal.

```plaintext
EXTM:IMP 50
EXTM:IMP?
> 50
```
Ext DC Cal: Ext DC Cal

Ext DC Cal: Ext DC Cal

Adjusts the DC offset for external modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

This can be used when in the modulation output status (setting either AM, FM, \( \phi \)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 \( \phi \)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
- \( \phi \)M = On and \( \phi \)M Source = Ext in \( \phi \)M1 Setup
- \( \phi \)M = On and \( \phi \)M 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
### Phase Adjust

Adjusts a phase of internal \( \phi \)M modulation signal.

This is available only when additional analog modulation input option (MG3710A/MG3740A-050/080/150/180) is installed.

Press **F5 Phase Adjust** in the second page of the FM/\( \phi \)M1 Setup (FM/\( \phi \)M2 Setup) function menu to set with the **Phase Adjust** dialog box.

**Remote command**

**Adjust the phase of internal \( \phi \)M modulation signal**

**Command**

```plaintext
```

**Query**

```plaintext
```

**Response**

- **Parameter**
  - `<phase>`: Phase of internal \( \phi \)M modulation signal
  - Range: –180 deg to +180 deg
  - Resolution: 0.1 deg
  - Default: 0 deg
  - Suffix code: DEG, When omitted: DEG

**Programming Example**

To set the phase of internal \( \phi \)M modulation signal to 10 deg.

**Command**

```
PM:INT:FUNC:POFF 10
PM:INT:FUNC:POFF?
```

Response

> 10.0
7.2.3 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 Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™), 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”.

![AUX connector](image)

**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.
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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Pulse Off On</td>
<td>Enables/disables the Pulse modulation.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Pulse Source Freerun</td>
<td>Selects the Pulse modulation signal source.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pulse Rate 400.0 Hz</td>
<td>Sets the Pulse modulation frequency.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Pulse Period 4.00 μs</td>
<td>Sets the Pulse modulation period.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Pulse Delay 0.00000000 s</td>
<td>Sets the Pulse modulation delay time after the trigger event.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Pulse Width 2.00 μs</td>
<td>Sets the Pulse modulation width.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Pulse 2 Delay 0.00000000 s</td>
<td>Sets the delay time of the second Pulse after the first Pulse.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Pulse 2 Width 2.00 μs</td>
<td>Sets the second Pulse width.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Ext Out Polarity Positive Negative</td>
<td>Selects the polarity of the Pulse Sync signal and Pulse Video signal.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Ext In Polarity Positive Negative</td>
<td>Selects the polarity of the signal input from the Pulse Mod terminal.</td>
</tr>
</tbody>
</table>
Chapter 7  Modulation

Pulse

 ENABLE 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

[:SOURce[1]|2]:PULM:STATe?

Response

<boolean>  0 or 1

Parameter

<boolean>  Pulse Modulation On/Off
OFF|0  Disables Pulse modulation (Default).
ON|1  Enables Pulse modulation.

Programming Example

To set the Pulse modulation to On.
PULM:STAT ON
PULM:STAT?
> 1
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.

### Table 7.2.3-2  Pulse Source Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Square</td>
<td>Internal freerun pulse string with 50% of duty cycle. The period is set with Pulse Rate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Square Pulse Diagram" /></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Freerun</td>
<td>Internal freerun pulse string (Default) The period and pulse width are set with Pulse Period and Pulse Width.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Freerun Pulse Diagram" /></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Triggered</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><img src="image" alt="Triggered Pulse Diagram" /></td>
</tr>
</tbody>
</table>

*Trigger inputs executed between the trigger input and the pulse completion are ignored.*
<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4</td>
<td></td>
<td>Adjustable Doublet</td>
<td>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.</td>
</tr>
</tbody>
</table>

![Diagram](image1)

| 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. |

![Diagram](image2)
### Table 7.2.3-2  Pulse Source Function Menu (Cont’d)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>F6</td>
<td></td>
<td>Gated</td>
<td>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.</td>
</tr>
<tr>
<td>F7</td>
<td></td>
<td>Ext Pulse</td>
<td>Generates the pulse signal in synchronization with the external trigger signal.</td>
</tr>
</tbody>
</table>

**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

\[:\text{SOURce}\{1\}|2\]:PULM:SOURce\ INTernal|EXTernal

Query

\[:\text{SOURce}\{1\}|2\]:PULM:SOURce?

Response

\(<\text{type}>\quad \text{INT or EXT}\)

Parameter

\(<\text{type}>\quad \text{Signal source}\)
\begin{align*}
\text{INTernal} & \quad \text{Freerun (Default)} \\
\text{EXTernal} & \quad \text{Ext Pulse}
\end{align*}

Programming Example

To set the Pulse modulation signal source to Freerun.

PULM:SOUR INT

PULM:SOUR?

\> INT

Remote command Select the Pulse modulation signal source from seven types Command

\[:\text{SOURce}\{1\}|2\]:PULM:SOURce:INTernal

SQUare|FRUN|TRIGgered|ADOublet|DOUBlet|GATed|EXTPulse

Query

\[:\text{SOURce}\{1\}|2\]:PULM:SOURce:INTernal?

Response

\(<\text{type}>\quad \text{SQU,FRUN,TRIG,ADO,DOUB,GAT or EXTP}\)

Parameter

\(<\text{type}>\quad \text{Signal source}\)
\begin{align*}
\text{SQUare} & \quad \text{Square} \\
\text{FRUN} & \quad \text{Freerun (Default)} \\
\text{TRIGgered} & \quad \text{Triggered} \\
\text{ADOublet} & \quad \text{Adjustable Doublet} \\
\text{DOUBlet} & \quad \text{Trigger Doublet} \\
\text{GATed} & \quad \text{Gated} \\
\text{EXTPulse} & \quad \text{Ext Pulse}
\end{align*}
7.2 Analog Modulation: Analog/Pulse

Programming Example
To set the Pulse modulation signal source to Freerun.
PULM:SOUR:INT FRUN
PULM:SOUR:INT?
> FRUN

Pulse Rate

Toggle 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 Hz to 10 MHz
Resolution 0.1 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> 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
Chapter 7  Modulation

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 ns to 20 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>`  Period
**Range**: 10 ns to 20 s
**Resolution**: 10 ns
**Default**: 4 µs
**Suffix code**: 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

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, or Trigger Doublet is selected at Pulse Source.

Range: 0 s to 20 s – Pulse Width
Resolution: 10 ns
Default: 0 s

Remote command

Set the Pulse modulation delay time

Command


Query


Response

<time> Unit: S

Parameter

<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, or 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 μs.

PULM:INT:DEL 15US
PULM:INT:DEL?
> 0.00001500
Chapter 7  Modulation

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

<table>
<thead>
<tr>
<th>Setting range</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limit</td>
<td>10 ns</td>
<td>Pulse Period$^1$</td>
</tr>
<tr>
<td>Upper limit</td>
<td></td>
<td>20 s – Pulse Delay$^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*1: When Pulse Source is set to Freerun or Gated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*2: When Pulse Source is Triggered, Adjustable Doublet, or Trigger Doublet</td>
</tr>
</tbody>
</table>

Resolution 10 ns
Default 2 μs

Remote command  Set the Pulse modulation width

Command


Query


Response

<time> Unit: S

Parameter

<time> Pulse modulation width

Setting range

<table>
<thead>
<tr>
<th>Setting range</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limit</td>
<td>10 ns</td>
<td>Pulse Period</td>
</tr>
<tr>
<td>Upper limit</td>
<td></td>
<td>20 s – Pulse Delay</td>
</tr>
<tr>
<td>(When Pulse Source is set to Freerun or Gated)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(When Pulse Source is Triggered, Adjustable Doublet, or Trigger Doublet)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resolution 10 ns
Default 2 μs
Suffix code S, MS, US, NS, PS, When omitted: S
7.2 Analog Modulation: Analog/Pulse

Details
This can be set when Freerun, Triggered, Adjustable Doublet, Trigger Doublet, Gated is selected at Pulse modulation signal source.

As for node :PWID[1]|2, select Pulse Width or Pulse 2 Width. Set as follows:

- **Pulse Width**: :PWID[1] or :PWID
- **Pulse 2 Width**: :PWID[2]

Programming Example
To set the first Pulse modulation width to 5 μs.

```
PULM:INT:PWID 5US
PULM:INT:PWID?
> 0.00000500
```

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 s to 20 s – 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**


**Query**


**Response**

`<time>` Unit: S

**Parameter**

- **<time>** The delay time from the first Pulse to the second Pulse
- **Range**: 0 s to 20 s – Pulse 2 Width – Pulse Delay
- **Resolution**: 10 ns
- **Default**: 0 s
- **Suffix code**: S, MS, US, NS, PS, When omitted: S
Chapter 7  Modulation

Details
This can be set when Adjustable Doublet is selected at Pulse modulation signal source.

As for node :DELay[1]|2, select Pulse Delay or Pulse 2 Delay. Set as follows:

Pulse Delay:: :DELay1 or :DELay.
Pulse 2 Delay:: :DELay2.

Programming Example
To set the delay time from the first Pulse to the second Pulse to 5 μs.
PULM:INT:DEL2 5US
PULM:INT:DEL2?
> 0.00000500

Pulse 2 Width

Sets the second 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 10 ns to 20 s – Pulse Delay – Pulse 2 Delay
Resolution 10 ns
Default 2 μs

Remote command
Set the second Pulse width

Command

Query

Response
<time> Unit: S

Parameter
<time> The second Pulse width
Range 10 ns to 20 s – Pulse Delay – Pulse 2 Delay
Resolution 10 ns
Default 2 μs
Suffix code S, MS, US, NS, PS, When omitted: S
7.2 Analog Modulation: Analog/Pulse

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

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.

Positive Positive polarity (Default)
Negative Negative polarity

Remote command

Select the output polarity of the Pulse Sync signal and Pulse Video 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> Output polarity of the Pulse Sync signal and Pulse Video signal
NORMal Positive polarity (Default)
INVerted 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

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.

Positive Positive polarity (Default)
Negative Negative 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> Input polarity of the Pulse Sync signal and Pulse
Video signal
NORMal Positive polarity (Default)
INVerted 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 Analog Modulation: Analog/Pulse

7.2.4 Optimize Function for the Analog Modulation: 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)
- **Distortion**: Enables the frequency offset. (Default for MG3740A)

Because the MG3710A/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](image)

**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 | Select the frequency offset of the analog modulation
Command | [:SOURce[1]|2]:AOPTimize:MODE SPURious|DISTortion

Query | [:SOURce[1]|2]:AOPTimize:MODE?

Response | <type> SPUR or DIST

Parameter | <type> Type
SPURious | Disables the frequency offset.
(Default for MG3710A)
DISTortion | Enables the frequency offset.
(Default for MG3740A)

Programming Example
To enable the frequency offset of the analog modulation.
AOPT:MODE DIST
AOPT:MODE?
> DIST
7.3 Baseband Mode

MG3710A/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/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/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/MG3740A, the pattern file and combination file are used unconsciously.
Pattern combination is specified.

Pattern package is selected from internal HDD and loaded into waveform memory.

Pattern to be output is selected from patterns loaded into waveform memory.

Either one or combination of patterns is output.

Figure 7.3-1 Relation of Pattern File and Combination File

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 IQproducer™ (supplied application software).
- Creates the waveform pattern with IQproducer™ (supplied application software) installed in the MG3710A/MG3740A.

For the method to transfer with IQproducer™, refer to the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.
7.3.1 ARB

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.

**Figure 7.3.1-1  ARB Info**
# 7.3 Baseband Mode

Table 7.3.1-1  ARB Info Display Contents

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Combination</td>
<td>Combination</td>
<td>Indicates to combine the waveform patterns of Memory A and Memory B to output. A+B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sequence</td>
<td>Indicates that it is in the sequence mode. Seq.(A), Seq.(A+AWGN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sequence +</td>
<td>Indicates that it is in the sequence mode with Add Pattern. Seq.(A+B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multiplex</td>
<td>Indicates Multiplex waveform output. (Multiplex)</td>
</tr>
<tr>
<td>2</td>
<td>---</td>
<td>Not Selected</td>
<td>Indicates that no waveform is selected.</td>
</tr>
<tr>
<td></td>
<td>Package</td>
<td>Waveform package name for the waveform output from Memory A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pattern</td>
<td>Waveform file name for the waveform output from Memory A</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>---</td>
<td>Not Selected</td>
<td>Indicates that no waveform is selected.</td>
</tr>
<tr>
<td></td>
<td>Package</td>
<td>Waveform package name for the waveform output from Memory B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pattern</td>
<td>Waveform file name for the waveform output from Memory B</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>AWGN</strong></td>
<td>On</td>
<td>Indicates that the AWGN signal is on.</td>
</tr>
<tr>
<td>4</td>
<td>Level –207.00 dBm</td>
<td>---</td>
<td>Indicates the output level of the signal from Memory A.</td>
</tr>
<tr>
<td>5</td>
<td>Level Ratio –63 00 dBm</td>
<td>Level Ratio</td>
<td>Indicates the output level ratio of the signals from Memory A and Memory B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/N Ratio</td>
<td>Indicates the output level ratio of the signal from Memory A or Memory B and AWGN signal.</td>
</tr>
<tr>
<td>6</td>
<td>Level –144 00 dBm</td>
<td>---</td>
<td>Indicates the output level of the signal from Memory B.</td>
</tr>
<tr>
<td>7</td>
<td>Freq Offset</td>
<td>A</td>
<td>Frequency image for the signal output from Memory A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Frequency image for the signal output from Memory B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNT</td>
<td>Center Frequency displayed frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>Offset frequency from Center Frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>AWGN signal</td>
</tr>
<tr>
<td>8</td>
<td>Start Offset 10/3 chip 868 ns</td>
<td>Start Offset</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/3 chip</td>
<td>Display with System Unit of Memory B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>868 ns</td>
<td>Display of the time above</td>
</tr>
</tbody>
</table>
Table 7.3.1-1  ARB Info Display Contents (Cont’d)

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td>---</td>
<td>Indicates that the signal output from Memory A and the signal output from the waveform memory B are being combined.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>---</td>
<td>Click to switch Hardware Block Chart and ARB Info display.</td>
</tr>
</tbody>
</table>

Table 7.3.1-2  ARB/Waveform Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>ARB Off On</td>
<td>Enables/disables the function to generate modulated signals with arbitrary waveform patterns.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Combination Mode Edit Defined</td>
<td>Sets the function mode to generate the pattern with Baseband. Refer to 7.3.2 “Pattern generation mode”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>ARB Setup</td>
<td>Displays the ARB Setup function menu. Refer to 7.3.3 “ARB Setup”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Load</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Select</td>
<td>Displays the Waveform Select function menu to select the waveform pattern to be output. Refer to 7.3.5 “Selecting output waveform pattern: Select”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Copy</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Restart</td>
<td>Restarts the waveform pattern being played. Both Pattern A and B are targeted.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>RF Gate</td>
<td>Displays the RF Gate function menu. Refer to 7.3.7 “RF Gate”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Start/Frame Trigger</td>
<td>Displays the Start/Frame Trigger function menu. Refer to 7.3.8 “Start/Frame Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Baseband Clock</td>
<td>Displays the Baseband Clock function menu. Refer to 7.3.11 “Baseband Clock”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Marker Setup</td>
<td>Displays the Marker Setup function menu. Refer to 7.3.12 “Marker Setup”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>RMS Value Tuning 0.00 dB</td>
<td>Tunes the RMS value input to D/A of the IQ waveform data.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Sequence Mode</td>
<td>Displays the Sequence Mode function menu. Refer to 7.3.13 “Sequence Mode”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Sync Multi SG</td>
<td>Displays the Sync Multi SG function menu. Refer to 7.3.15 “Sync Multi SG”.</td>
</tr>
</tbody>
</table>
7.3 Baseband Mode

ARB On/Off: ARB

Enables/disables the function to generate modulated signals with arbitrary waveform patterns.

In MG3740A, this can be used only when option-020/120 is installed.

Press F1 ARB of the 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 function to generate modulated signals with arbitrary waveform patterns

Command

[:SOURce\[1\]|2]:RADio:ARB[:STATe] <boolean>

Query

[:SOURce\[1\]|2]:RADio:ARB[:STATe]?

Response

<boolean>  0 or 1

Parameter

<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 Example

To set the generation of modulated signals with arbitrary waveform patterns to On.

RAD:ARB ON
RAD:ARB?
> 1
Chapter 7  Modulation

Restart

Mode or Top>Mode, >Restart
Restarts the waveform pattern being played.
Both Pattern A and B are targeted.

In MG3740A, this can be used only when option-020/120 is installed.

Press F8 Restart on the ARB function menu for execution.

Remote command
Restart the waveform pattern
Command
[:SOURce[1]|2]:RADio:ARB:WAVeform:RESTart

Programming Example
To playback the waveform pattern from the beginning.
RAD:ARB:WAV:REST

RMS Value Tuning

Mode or Top>Mode, >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 Tuning on page 2 of the ARB/Waveform function menu for setting.

Range –8.00 dB to 8.00 dB
Resolution 0.01 dB
Default 0.00 dB

Remote command
Tune the IQ Waveform data input amplitude
Command
[:SOURce[1]|2]:RADio:ARB:RMSTuning <rel_ampl>

Query
[:SOURce[1]|2]:RADio:ARB:RMSTuning?

Response
<rel_ampl> Unit: dB
7.3 Baseband Mode

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;rel_ampl&gt;</td>
<td>IQ waveform data input amplitude</td>
</tr>
<tr>
<td>Range</td>
<td>–8.00 dB to 8.00 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Default</td>
<td>0.00 dB</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DB, When omitted: DB</td>
</tr>
</tbody>
</table>

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 **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.
Chapter 7  Modulation

7.3.2 Pattern generation mode: Combination Mode

Sets the function mode to generate the pattern with Baseband.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F2 Combination Mode** on the ARB/Waveform function menu for setting.

**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 mode to generate the pattern with Baseband

**Command**

[:SOURce[1]|2]:RADio:ARB:PCOMbination EDIT|DEFined

**Query**

[:SOURce[1]|2]:RADio:ARB:PCOMbination?

**Response**

<mode> EDIT or DEF

**Parameter**

<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:FCOM EDIT
RAD:ARB:FCOM?
> EDIT
To execute modulation with 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 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”.

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 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”.

**Figure 7.3.2-1 ARB Info (Combination)**
To execute continuous operations in Defined mode.

![Combination Mode](image)

**Figure 7.3.2-2  ARB Info (Sequence+)**

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 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”.
4. Light the lamp (green) of key to start the vector modulation 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.

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 (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.

![Diagram](image-url)
To output the pattern loaded into Memory A for modulation in Edit mode

or Top>Mode>Combination Mode

![ARB Info](image)

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 **** to light the lamp (green) of the key to start the vector modulation.
Chapter 7  Modulation

To combine outputs from Memory A and B for modulation in Edit mode

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.

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/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/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.
7.3 Baseband Mode

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

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.

Memory A: W-CDMA signal
fs = 15.36 MHz (3.84 MHz × 4)

Memory B: GSM signal
fs = 3.25 MHz (270.833 kHz × 12)

Output: W-CDMA+GSM signal (Combined and output with each sampling rate (fs) maintained.)

Some combinations of waveform sampling rates may disable rate matching due to internal operation clock limitation of the MG3710A/MG3740A. In this case, Rate Mismatch warning is displayed.
Chapter 7 Modulation

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)](image1)
![Memory B: GSM signal (RateMismatch)](image2)

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

![Mode](Mode) or **Top>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](Figure 7.3.2-10)
Chapter 7  Modulation

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.

6. Set the time offset of Pattern B based on Pattern A side with **F5 Start Offset** in Page 2.

7. Press **Mod 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

or Top > Mode > ARB Setup

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.

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.

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.
6. 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 **** to light the lamp (green) of the key to start the vector modulation.
Various settings for pattern output

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

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.

#### Table 7.3.3-1 ARB Setup Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Output A</td>
<td>Enables/disables the Pattern A output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Level A</td>
<td>Sets the Pattern A output level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-144.00 dBm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Output B</td>
<td>Enables/disables the Pattern B output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Level B</td>
<td>Sets the Pattern B output level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-144.00 dBm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>A/B Signal</td>
<td>Selects the target for level change on A/B Ratio change.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting</td>
<td>(The option which is not selected is fixed.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A  B  A&amp;B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>A/B Ratio</td>
<td>Sets the level ratio of Pattern A and Pattern B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Sampling Rate A</td>
<td>Sets the Pattern A sampling rate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.000000 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Sampling Rate B</td>
<td>Sets the Pattern B sampling rate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.000000 Hz</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Freq Offset</td>
<td>Sets the frequency offset between Pattern A and B.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Hz</td>
<td>When CenterSignal is A or B, the frequency offset is set</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with this parameter.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Freq Offset A</td>
<td>Sets the frequency offset of Pattern A based on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Hz</td>
<td>Baseband center frequency.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Freq Offset B</td>
<td>Sets the frequency offset of Pattern B based on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Hz</td>
<td>Baseband center frequency.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Center Signal</td>
<td>Selects the pattern to be the reference on frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Baseband DC</td>
<td>display.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Start Offset</td>
<td>Sets the time offset of Pattern B based on Pattern A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>side.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Spectrum A</td>
<td>Swaps I/Q of Pattern A and reverses the spectrum.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
<td>Reverse</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Spectrum B</td>
<td>Swaps I/Q of Pattern B and reverses the spectrum.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
<td>Reverse</td>
</tr>
</tbody>
</table>
7.3  Baseband Mode

Output A/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.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Does not output Pattern A/B.</td>
</tr>
<tr>
<td>On</td>
<td>Outputs Pattern A/B.</td>
</tr>
<tr>
<td>Default</td>
<td>Output A On</td>
</tr>
<tr>
<td></td>
<td>Output B Off</td>
</tr>
</tbody>
</table>

Remote command

Enable/disable the Pattern A/B output

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> Frequency relative 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

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.

- **A** Fixes Level B and changes Level A.
- **B** Fixes Level A and changes Level B.
- **A&B** Fixes OutputLevel and changes Level A and Level B. (Default)

**Remote command**

**Select the target for level change on A/B Ratio change**

**Command**

```
```

**Query**

```
```

**Response**

```
<mode>
```

**Parameter**

```
<mode>
```

- **Target for level change on A/B Ratio change**
  - **A** Fixes Level B and changes Level A.
  - **B** 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

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 dB to 80 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>**: Level ratio of Pattern A and Pattern B
- **Range**: –80 dB to 80 dB
- **Resolution**: 0.01 dB
- **Default**: 0 dB
- **Suffix code**: 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
```
7.3 Baseband Mode

Sampling Rate A/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)
- 0.02 to 8 MHz (MG3740A)
Resolution 0.001 Hz
Default 20 kHz

Remote command

Query the baseband signal sampling rate

Command

Query

Response
<freq> Unit: Hz

Parameter
<freq> Sampling rate
Range
- 0.02 to 200 MHz (MG3710A)
- 0.02 to 8 MHz (MG3740A)
Resolution 0.001 Hz
Default 20 kHz
Suffix code 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
Chapter 7  Modulation

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 MHz /2 to 200 MHz /2 (MG3710A)
–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/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> Frequency
Range –200 MHz /2 to 200 MHz /2 (MG3710A)
–8 MHz to 8 MHz (MG3740A)
Resolution 1 Hz
Default 0 Hz
Suffix code 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.

FreqOffsetA = +10MHz
FreqOffsetB = -15MHz
CenterSignal = Baseband DC

FreqOffset = -15MHz
CenterSignal = A

FreqOffset = 10MHz
CenterSignal = 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

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)
-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/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

Query

Response
<freq> Unit: Hz

Parameter
<freq> Frequency
Range
-200 MHz/2 to 200 MHz /2 (MG3710A)
-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

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.

- **A** Pattern A is the reference.
- **B** 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>** Pattern for frequency display
  - **A** Pattern A is the reference.
  - **B** 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
Chapter 7  Modulation

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**


**Query**


**Response**

<ext_integer>

**Parameter**

<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
7.3 Baseband Mode

Spectrum A/Spectrum B

I/Q swap for Pattern A is executed and the spectrum is reverred.
Spectrum A reverses the spectrum of the waveform memory A, and Spectrum B reverses the spectrum of the waveform memory B. Similar to this, F2 RF Spectrum of the Frequency function menu on page 2 inverts the spectrum of the waveform memory A and B, respectively. Reversing RF Spectrum and Spectrum A or B simultaneously returns the status to Normal.

In MG3740A, this can be used only when option-020/120 is installed.

Press F6 Spectrum A/F7 Spectrum B on page 2 of ARB Setup function menu for setting.

Normal Does not reverse (Default).
Reverse Reverses.

Remote command

Set the spectrum reverse

Command

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:SPECtrum NORMal|INVert

Query

[:SOURce[1]|2]:RADio:ARB:WMA|WMB:SPECtrum?

Response

(mode) NORM or INV

Parameter

(mode) Spectrum reverse On/Off
NORMal Does not reverse (Default).
INVert Inverts.

Programming Example

To set the spectrum reverse for Pattern A.

RAD:ARB:WMA:SPEC INV
RAD:ARB:WMA:SPEC?
> INV
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.

![Waveform List to Load](image-url)

Figure 7.3.4-1 Waveform List to Load
### Table 7.3.4-1  Waveform List to Load

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive C:</td>
<td>Drive number</td>
</tr>
<tr>
<td>2</td>
<td>Pattern in Packages : Test</td>
<td>Name of package displaying pattern</td>
</tr>
<tr>
<td>3</td>
<td>Package Name</td>
<td>Package file name</td>
</tr>
<tr>
<td>4</td>
<td>Pattern Name</td>
<td>Pattern file name</td>
</tr>
<tr>
<td>5</td>
<td>Type</td>
<td>File type</td>
</tr>
<tr>
<td>6</td>
<td>Status*</td>
<td>Status</td>
</tr>
<tr>
<td></td>
<td>Comment 1/2/3</td>
<td>Displays the Comment Lines 1/2/3</td>
</tr>
<tr>
<td></td>
<td>Version</td>
<td>Version number</td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>File size</td>
</tr>
<tr>
<td></td>
<td>Sampling Rate</td>
<td>Sampling frequency</td>
</tr>
<tr>
<td></td>
<td>RMS Value</td>
<td>RMS value</td>
</tr>
<tr>
<td>7</td>
<td>3.992 378 056 GByte Free</td>
<td>Remaining free Memory A or Memory B</td>
</tr>
<tr>
<td>8</td>
<td>54 patterns</td>
<td>Number of patterns included in the selected package</td>
</tr>
</tbody>
</table>

*: 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:WAve:VERSion? <string1>,<string2>[,<device>]

`:MMEMory:WAve:SIngle:VERSion? <string1>,<string2>[,<device>]

**Response**

`<version>`

**Parameter**

`<device>` Source drive number A to Z, currently selected drive when omitted

`<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 (’ ’)

`<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:WAve:VERS? "WCDMA","TEST"
> 1.00`
Remote command

**Query**

:MEMory:FREE[:ALL]? [<device>]

**Response**

<integer1>,<integer2> Unit: byte

**Parameter**

<integer1> Number of bytes in whole HDD
<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**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Selects the device which includes the waveform pattern to be queried.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Focus Package Pattern</td>
<td>Moves the cursor between Package/Pattern frames.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Update Info</td>
<td>Updates the waveform pattern information in HDD.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Subitem Status</td>
<td>Switches the Subitem displayed items in Waveform List to Load dialog box.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Show Details</td>
<td>Displays details of the selected waveform pattern information in HDD.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Load Pattern</td>
<td>Loads the selected pattern in Waveform List to Load dialog box.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Load All Patterns</td>
<td>Loads all of the patterns in selected package in Waveform List to Load dialog box.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>To Memory A</td>
<td>Selects the waveform memory for the pattern to be loaded into.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F5</td>
<td>Delete pattern from selected drive</td>
<td>Deletes the selected waveform pattern.</td>
</tr>
</tbody>
</table>
Example: To load the waveform pattern into the waveform memory of MG3710A/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

Selects the device which 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 Waveform Load function menu to display the Device function menu for selection.

Options: All connected Drives
Default: C

Moving cursor: Focus

Moves the cursor between Package/Pattern frames in the Waveform List to Load dialog box.

In MG3740A, this can 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

Updates the waveform pattern information in HDD.

In MG3740A, this can be used only when option-020/120 is installed.

Press F3 Update Info on the Waveform Load function menu for selection.

Remote command

Update the waveform pattern information in the HDD to enable loading Command

To update all the waveform pattern information.

:MMEMory:UPDATE:WAVEform:ALL

To update the single pattern file (wvi/wvd).

(If there is a wvc/wvi with the same name, both files are upload.)

:MMEMory:UPDATE:WAVEform <string1>,<string2>[,<device>]
Parameter
<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 (‘ ’)
<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

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.
F1 Status Pattern type
F2 Comment Line1 Comment Line 1
F3 Comment Line2 Comment Line 2
F4 Comment Line3 Comment Line 3
F5 Version Version number
F6 Size File size
F7 Sampling Rate Sampling frequency
F8 RMS Value RMS value
Show Details

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.

![Figure 7.3.4-2  Details of Waveform Data](image)

<table>
<thead>
<tr>
<th>Package</th>
<th>Pattern file name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pattern</td>
<td>Pattern file name</td>
</tr>
<tr>
<td>[Comment]</td>
<td></td>
</tr>
<tr>
<td>Line1 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line2 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line3 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line4 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line5 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line6 =</td>
<td>Comment</td>
</tr>
<tr>
<td>Line7 =</td>
<td>Comment</td>
</tr>
</tbody>
</table>

Load Pattern

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

```
<string1>,<string2>[,<device>]
```

Query

```
:MMEMory[1]|2:LOAD:WAVeform:WMA|WMB|LONG|COMBination?
<string1>,<string2>[,<device>]
```

Response

```
<status>
```

Parameter

```
<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 ('')

<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
  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 pattern is loaded when the same waveform pattern has already been loaded, the existing waveform pattern is overwritten.

Programming Example
To start loading “RMC15k” pattern file in package “WCDMA” in drive E into the SG2 waveform memory A.

```
MMEM2:LOAD:WAV:WMA "WCDMA","RMC15k",E
*OPC? // Loaded when 1 is returned
> 0    // Already loaded
```

Remote command
Confirm the loading status
Query
```
```
Response
1 Being loaded.
0 Not being loaded.

Programming Example
To confirm SG2 loading status.

```
MMEM2:LOAD:WAV:STAT?
> 1
```

Remote command
Cancel the active loading operation
Command
```
```

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.
Table 7.3.4-3  Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm overwriting</td>
<td>Deletes contents of Memory A and Memory B and loads Long Pattern</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All Loaded Pattern</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

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.

![Diagram of Memory A and B with package and patterns]

In this case, there are a total of six waveform files included in package 1.

Load All Patterns

![Load button]

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**.
7.3 Baseband Mode

Loading destination: To Memory

Selects the waveform memory for the pattern to be loaded into.

In MG3740A, this can be used only when option-020/120 is installed.

This function specifies the loading destination waveform memory when the pattern file is loaded without being LongPattern. This function is disabled for the combination file and LongPattern because their loading destination waveform memory has been already determined.

Press F8 To Memory on the Waveform Load function menu for selection. This is not displayed when the waveform memory B option is not installed.

A Waveform memory A (Default)
B Waveform memory B

Delete

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 the deletion.

Table 7.3.4-4 Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Deletion</td>
<td>Deletes the waveform pattern.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns the menu before this menu is opened.</td>
</tr>
</tbody>
</table>
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:SI NGle[:NAME]
<string1>,<string2>,[<device>]

Parameter

<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 (’ ’)

<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.
Table 7.3.5-1  Waveform List to Play

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>in Memory A</td>
<td>Indicates the displayed memory when Combination Mode is Edit.</td>
</tr>
<tr>
<td>2</td>
<td>Pattern in Packages : Test</td>
<td>Name of package displaying pattern</td>
</tr>
<tr>
<td>3</td>
<td>Package Name</td>
<td>Package file name</td>
</tr>
<tr>
<td>4</td>
<td>Pattern Name</td>
<td>Pattern file name</td>
</tr>
<tr>
<td>5</td>
<td>Type</td>
<td>Indicates the memory type or comb (combination file) when Combination Mode is Edit. Indicates the file type when Combination Mode is Defined.</td>
</tr>
<tr>
<td>6</td>
<td>Status*</td>
<td>Status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comment 1/2/3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Version</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sampling Rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RMS Value</td>
</tr>
<tr>
<td>7</td>
<td>4 patterns</td>
<td>Number of patterns included in the selected package</td>
</tr>
</tbody>
</table>

*: Displayed items switch according to Waveform Select function menu and Subitem Status.
Table 7.3.5-2 Waveform Select Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F2</td>
<td>Focus Package</td>
<td>Moves the cursor between Package/Pattern frames.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pattern</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Subitem Status</td>
<td>Switches the Subitem displayed items in Waveform List to Play dialog box.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Select</td>
<td>Selects the waveform file to be output.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>On Memory A B</td>
<td>Switches the Memory of the waveform pattern information to be displayed in Waveform List to Play dialog box.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Delete</td>
<td>Deletes the selected package and pattern in the waveform memory.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Clear Memory</td>
<td>Deletes all patterns in the waveform memory.</td>
</tr>
</tbody>
</table>

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.

1. 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.

2. 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.

1. 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 deleted with the direction key or rotary knob.

2. The list of waveform files is displayed. Select Pattern with F2 Focus, 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.
Range 0 to (Number of waveform patterns in the 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 (‘’ )
7.3 Baseband Mode

Programming Example
To query the second waveform pattern name loaded in SG1 waveform memory A.
MEM:WAV:WMA:NAME? 2
> "WCDMA","TEST"

Remote command
Query the number of waveform patterns loaded in the waveform memory
Query
:MEMory[1]|2:WAVeform:WMA|WMB|LONG|COMBination:COUNT?

Response
<integer>

Parameter
<integer> Number of waveform patterns loaded into waveform memory
Range 0 to 4096
Resolution 1

Programming Example
To query the number of waveform pattern files loaded into SG1 waveform memory A.
MEM:WAV:WMA:COUN?
> 2

Remote command
Query the waveform memory free space
Query
For the waveform memory A

For the waveform memory B

Response
<integer1>,<integer2>,<integer3>

Parameter
<integer1> Free space (in byte)
<integer2> Continuous free space (in byte)
<integer3> Total waveform memory size (in byte)
Chapter 7  Modulation

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.

Press 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.

F1 Status       Pattern type
F2 Comment Line1  Comment Line 1
F3 Comment Line2  Comment Line 2
F4 Comment Line3  Comment Line 3
F5 Version       Version number
F6 Size          File size
F7 Sampling Rate Sampling frequency
F8 RMS Value     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:WAVeofrm <string1>,<string2>
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:WMA|WMB|LONG|COMBination:WAVeofrm?
```

**Response**

```
<string1>
"NONE" is returned when nothing is selected.
<string2>
"NONE" is returned when nothing is selected.
```

**Parameter**

```
<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 (’ ’)
```

- **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"
```
Chapter 7  Modulation

Selecting waveform pattern: 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

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>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Deletion</td>
<td>Deletes the waveform pattern.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

Remote command

Delete the specified package and waveform file in the waveform memory

Command
7.3 Baseband Mode

Parameter

<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 (' ')

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

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.

Table 7.3.5-4 Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Deletion</td>
<td>Deletes the waveform patterns.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns the menu before this menu is opened.</td>
</tr>
</tbody>
</table>
Remote command | Delete all waveform patterns in the waveform memory

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

Copies the waveform pattern of the external device such as USB memory to the internal HDD of MG3710A/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 Copy Pattern to HDD dialog box and Copy Pattern function menu.

Figure 7.3.6-1 Waveform List to Copy

Table 7.3.6-1 Waveform List to Copy

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive C:</td>
<td>Drive number</td>
</tr>
<tr>
<td>2</td>
<td>Package Name</td>
<td>Package file name</td>
</tr>
<tr>
<td>3</td>
<td>Pattern Name</td>
<td>Pattern file name</td>
</tr>
<tr>
<td>4</td>
<td>Type</td>
<td>File type</td>
</tr>
<tr>
<td>5</td>
<td>Path</td>
<td>Location where pattern file saved</td>
</tr>
<tr>
<td>6</td>
<td>54 patterns</td>
<td>Number of patterns included in the selected package</td>
</tr>
</tbody>
</table>
Table 7.3.6-2  Waveform Copy Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C</td>
<td>Selects the copy source device for the waveform pattern.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Focus Package Pattern</td>
<td>Moves the cursor between Package/Pattern frames.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Copy Pattern/Package</td>
<td>Copies the selected waveform pattern to HDD.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Copy All Patterns/Packages</td>
<td>Copies all waveform files/packages to HDD.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>To Drive C:</td>
<td>Sets the copy destination drive for the waveform file.</td>
</tr>
</tbody>
</table>

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.

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 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.
Chapter 7  Modulation

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  C

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.

Press 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.

F1 Status  Pattern type
F2 Comment Line1  Comment Line 1
F3 Comment Line2  Comment Line 2
F4 Comment Line3  Comment Line 3
F5 Version  Version number
F6 Size  File size
F7 Sampling Rate  Sampling frequency
F8 RMS Value  RMS value
7.3 Baseband Mode

Copy Pattern/Copy Package

or Top>Mode, >Copy>Copy Pattern/Copy Package
Copies the selected waveform pattern of the specified drive to HDD.

In MG3740A, this can be used only when option-020/120 is installed.

Press F6 Copy Pattern/Copy Package on the Waveform Copy function menu for copy.

When Pattern is selected with F2 Focus, Copy Pattern is executed, and when Package is selected, Copy Package is executed.

Remote command

Copies the selected waveform pattern of the specified drive to HDD.

Command
To copy all waveform patterns in the specified folder.
:MMEMory:COPY:WAVeform:ALL
<device1>[,<string>|ROOT[,<device2>]]

To copy 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:COPY:WAVeform
<device1>,<string>|ROOT,<string1>[,<device2>]

To copy the single pattern file (wvi/wvd).
The combination file (wvc) cannot be copied with this command.
:MMEMory:COPY:WAVeform:SINGle
<device1>,<string>|ROOT,<string1>[,<device2>]

Parameter

<device1> Copy source drive A to Z,
drive C when omitted
<device2> Copy destination drive A to Z,
drive C when omitted
<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> 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

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.

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 F7 Copy All Patterns on the Waveform Copy function menu to copy the waveform patterns.
7.3 Baseband Mode

**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**

Press **F8 To Drive** on the Waveform Copy function menu for setting.
7.3.7 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>RF Gate</td>
<td>Enables/disables the RF Gate function.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Edit Mode</td>
<td>Sets the RF Gate edit function.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On  Sync</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Type</td>
<td>Sets the number of RF Gate lines to be edited.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single  Double</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Offset 1</td>
<td>Sets Offset from the top output of Pattern to RF Gate1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Width 1</td>
<td>Sets the RF Gate1 width.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Offset 2</td>
<td>Sets Offset for the RF Gate2 timing after Pattern top output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Width 2</td>
<td>Sets the RF Gate2 width.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cycle</td>
<td>Sets the cycle for RF Gate1 and RF Gate2. The cycle for RF Gate1 and RF Gate2 is common.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>
RF Gate

Enables/disables the RF Gate function.

In MG3740A, this can be used only when option-020/120 is installed.

Press \textbf{F1 RF Gate} on the RF Gate function menu to set On/Off.

\begin{itemize}
  \item \textbf{Off} \quad RF Gate is not used. Constant output.
  \item \textbf{On} \quad RF output On/Off control is executed with RF Gate (Default).
\end{itemize}

Remote command

Enable/disable the RF Gate function

Command

\[ [:\text{SOUR}ce[1]|2]:\text{RADio:ARB:RFGate} \ <\text{boolean}> \]

Query

\[ [:\text{SOUR}ce[1]|2]:\text{RADio:ARB:RFGate}? \]

Response

\(<\text{boolean}> \quad 0 \ or \ 1\)

Parameter

\(<\text{boolean}> \quad \text{RF Gate function On/Off}\)

\text{OFF}|0 \quad \text{RF Gate is not used. Constant output.}

\text{ON}|1 \quad \text{RF output On/Off control is executed with RF Gate (Default).}

Programming Example

To set the RF Gate function to On.

\[
\text{RAD:ARB:RFG ON}
\]

\[
\text{RAD:ARB:RFG?} \quad > \quad 1
\]

Editing RF Gate: Edit Mode

Enables/disables the RF Gate edit function.

In MG3740A, this can be used only when option-020/120 is installed.

Press \textbf{F2 Edit Mode} on the RF Gate function menu to set On/Off.

\begin{itemize}
  \item \textbf{Off} \quad RF Gate bit in Pattern is used.
    \begin{itemize}
      \item When both Pattern A and B have been selected, the RF Gate bit in Pattern A is used (Default).
    \end{itemize}
  \item \textbf{On} \quad RF Gate is edited. RF Gate frequency is set by the user. RF Gate bit in Pattern is disabled.
\end{itemize}
Sync

RF Gate is edited. RF Gate cycle synchronizes with the Pattern cycle. RF Gate bit in Pattern is disabled.

The MG3710A/MG3740A allows handling up to 16 bits of waveform data bit length. In this case, the RF Gate signal cannot be embedded in the waveform data; therefore, this function is used for editing.

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 MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).

Remote command

Enable/disable the RF Gate function

Command

::{1/2}:RADio:ARB:PULSe:EDIT[:STATe] ON|OFF|PATSync

Query

::{1/2}:RADio:ARB:PULSe:EDIT[:STATe]?

Response

<mode> ON, OFF or PATS

Parameter

<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 Example

To set the RF Gate edit function to On (the cycle is set by the user).

RAD:ARB:PULS:EDIT ON
RAD:ARB:PULS:EDIT?
> ON
7.3 Baseband Mode

RF Gate line: 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**

\[
[:SOURce[1]|2]:RADio:ARB:PULSe:TYPE \text{ SINGle|DOUBle}
\]

**Query**

\[
[:SOURce[1]|2]:RADio:ARB:PULSe:TYPE?
\]

**Response**

\[
<\text{mode}> \quad \text{SING or DOUB}
\]

**Parameter**

\[
<\text{mode}> \quad \text{RF Gate edit function On/Off}
\]

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 Example**

To set the number of RF Gate lines to be edited to two lines.

\[
\text{RAD:ARB:PULS:TYPE \ DOUB}
\]

\[
\text{RAD:ARB:PULS:TYPE?}
\]

> DOUB
RF Gate offset 1/2: 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: \((2^{24} - 1)/\text{OverSampling}\) 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.

![Diagram of RF Gate Offset, Width, and Cycle](image)

**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**

```
```

**Query**

```
```

**Response**

```
<ext_numeric>
```
**7.3 Baseband Mode**

**Parameter**

<ext_numeric> Offset value from the top output of Pattern to RF Gate 1/2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset value</td>
<td>Offset value from the top output of Pattern to RF Gate 1/2</td>
</tr>
<tr>
<td>Lower limit</td>
<td>0</td>
</tr>
<tr>
<td>Upper limit</td>
<td>((2^{24} - 1) \div \text{OverSampling A/B})</td>
</tr>
</tbody>
</table>

| 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 Gate 2 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**

Sets the RF Gate 1/2 width.

In MG3740A, this can be used only when option-020/120 is installed.

Press F5 Width 1/F7 Width 2 on the RF Gate function menu for setting.

**Setting range**

| Minimum value | 1 \div \text{OverSampling A/B} |
| Maximum value | \((2^{24} - 1) \div \text{OverSampling A/B}\) (Rounded to two decimal places) |
| or RF Gate Cycle, whichever smaller |
| or DataPointA/B \div \text{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
Chapter 7  Modulation

SystemUnit A/B  Data unit for each system (Symbol, Bit, Chip, and others)
DataPointA/B  Waveform pattern cycle

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 RF Gate1/2 width
Command

Query

Response
<ext_numeric>

Parameter
<ext_numeric>  RF Gate1/2 width
Setting range, resolution, and default
Refer to the above explanation.
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 Gate1 width to 1.
RAD:ARB:PULS:EDIT:WIDT 1
RAD:ARB:PULS:EDIT:WIDT?
> 1.00
7.3 Baseband Mode

RF Gate cycle: 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 \div \text{OverSampling A/B}
- **Upper limit**: $(2^{24} - 1) \div \text{OverSampling A/B}
  
  (Rounded 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>** Cycle for RF Gate1 and RF Gate2
  - **Range** 1 ÷ OverSampling A/B to 
    \((2^{24} - 1) ÷ OverSampling A/B\)
  - **Resolution** 0.01
  - **Default** 1
  - **Unit** SystemUnit A/B
  - **Suffix code** 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 Baseband Mode

#### 7.3.8 Start/Frame Trigger

Press F2 **Start/Frame Trigger** on the ARB/Waveform function menu to open the Start/Frame Trigger function menu.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Start/Frame Trigger</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Mode</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Source</td>
<td>Selects Start/Frame Trigger Source. In MG3740A, this can be selected only when option-020/120 is installed.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Delay 0.00</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Edge Rise Fall</td>
<td>Sets the detection edge of Start/Frame trigger input. In MG3740A, this can be selected only when option-020/120 is installed.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Event Buffered Trig</td>
<td>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”</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Frame Count 1 Frame</td>
<td>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”</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Trigger Key</td>
<td>Generates Start/Frame Trigger manually. This is executable only from this menu. When SFTriggerSource is Trigger Key, executing this function applies the trigger.</td>
</tr>
</tbody>
</table>
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/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.

1. 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:
   
   \[
   \text{Frame Length} = 3.84 \times 10^6 \text{[sample/s]} \times 0.01 \text{[s]} \times 4 \text{[Over sampling ratio]} = 153600
   \]

   For details, refer to 4.5.3 “Editing Convert data” in the
   
   MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).
(2) When the waveform pattern is generated with the application to generate the signal which is the option of IQproducer™

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
  
  $L_f =$ The number of samples for 1 Frame of the system is set.
  
  $L_g =$ 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.

![Frame Trigger Timing](image)

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.

\[ N \text{ [sample]} = (L_d + L_g) - (L_d + 1) \]

* For \(L_d\) 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 \(N\) (\(N_{\text{max}}\)) can be calculated with the equation below according to the Interpolation Ratio (IPLR) determined with Sampling Clock (\(f_s\)).
* In the equation above, when \(N\) exceeds \(N_{\text{max}}\), \(N\) is assumed to be \(N_{\text{max}}\).

\[ N_{\text{max}} = \frac{28}{\text{IPLR}} \]

IPLR: \(2^n\) value that satisfies \(160 \text{ MHz} \geq \text{IPLR} \times f_s > 80 \text{ MHz} \)

\(n\) is an integer of 3 or higher

However, for \(f_s > 20 \text{ MHz}\), IPLR is assumed to be 1.

Here, for example, when \(L_d = 140\) symbol, \(L_g = 280\) symbol, and Sampling Clock = 50 MHz, the right side of \(N\) equation above exceeds \(N_{\text{max}}\); therefore, \(N=28\) is assumed, and the trigger input with the cycle which is shorter than Frame cycle \((L_d + L_g)\) by 28 samples or more is invalid.
### 7.3 Baseband Mode

#### System

Frame cycle

External trigger signal input earlier than Frame cycle by \( N_{\text{sample}} \) or more is invalid, and waveform pattern is not output.

![Figure 7.3.8-3 Frame Trigger Cycle](image)

**Remote command**

Enable/disable the trigger to be used for Baseband signal output start

**Command**

\[ [:\text{SOURce}[1]|2]:\text{RADio}:\text{ARB}:\text{TRIGger}[:\text{STATe}] <\text{boolean}> \]

**Query**

\[ [:\text{SOURce}[1]|2]:\text{RADio}:\text{ARB}:\text{TRIGger}[:\text{STATe}]? \]

**Response**

\(<\text{boolean}> \quad 0 \text{ or } 1 \)

**Parameter**

\(<\text{boolean}> \quad \text{Trigger On/Off}\)

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 mode for the trigger to be used for Baseband signal output start.

In MG3740A, this can be used only when option·020/120 is installed.

Press **F2 Mode** on the Start/Frame Trigger function menu for selection.

**Start**  
Start Trigger (Default)

**Frame**  
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]:RADIO:ARB:TRIGGER:MODE?

**Response**

<mode>  
STAR or FRAME

**Parameter**

<mode>  
External trigger operation mode

START  
Start trigger

FRAME  
Frame trigger

**Programming Example**

To set the operation mode for the external trigger to Start trigger.

RAD:ARB:TRIG:MODE STAR

RAD:ARB:TRIG:MODE?

> STAR
7.3 Baseband Mode

Trigger source: 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.
- Bus: Receives remote command * TRG.
- 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)
  - BUS: Receives remote command * TRG.
  - SYNC: 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).
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**

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

**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
7.3 Baseband Mode

**Parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start trigger delay time</td>
<td>Varies depending on the selected waveform pattern.</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01</td>
</tr>
<tr>
<td>Default</td>
<td>0</td>
</tr>
<tr>
<td>Unit</td>
<td>SystemUnit</td>
</tr>
<tr>
<td>Suffix code</td>
<td>None</td>
</tr>
<tr>
<td>Start trigger delay time</td>
<td>0.01 s</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 ps</td>
</tr>
</tbody>
</table>

**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**

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**

[:SOURce[1]|2]:RADio:ARB:TRIGger:SLOPe POSitive|NEGative

**Query**

[:SOURce[1]|2]:RADio:ARB:TRIGger:SLOPe?

**Response**

<edge> POS or NEG
**Parameter**

- **<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 Baseband Mode

7.3.9 Setting Frame trigger operation: Event

Frame trigger has four types of operations. The trigger operation when it is used is set.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F6 Event** on the Start/Frame Trigger function menu to open the S/F Trigger Event function 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 operation when Frame trigger is used**

**Command**

```
[:SOURce[1]|2]:RADio:ARB:TRIGger:RETRigger
BUFFered|NORetrig|RESTart
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:TRIGger:RETRigger?
```

**Response**

```
<mode> BUFF,NOR or REST
```

**Parameter**

- `<mode>`
  - **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](image)

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](image)

**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

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>` 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.

![Figure 7.3.10-1  Frame Trigger No Retrigger](image)

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](image)
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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.

![Figure 7.3.10-3 Frame Trigger Restart on Trigger](image)

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](image)
7.3 Baseband Mode

7.3.11 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.

Table 7.3.11-1 Baseband Clock Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Source</td>
<td>Selects the Baseband Reference Clock signal source.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Int</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Division</td>
<td>Sets the division ratio for the external input Clock for generation of Baseband Reference Clock.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Out</td>
<td>Sets the Baseband clock reference to Off (not to be output) or On (to be output).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On</td>
<td></td>
</tr>
</tbody>
</table>

Clock source: 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 DUT clock or others.
Ext(BB Ref Sync)  The clock input from the rear panel BB REF Clock Input is the reference. Used for synchronization for multiple MG3710As. BB REF Clock Output of MG3710A 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

**Select the Baseband Reference Clock signal source**

**Command**

```plaintext
[:SOURce[1]|2]:RADio:ARB:CLOCk:REFerence[:SOURce]
INTERNAL|EXTERNAL|EXTSync|SYNC
```

**Query**

```plaintext
[:SOURce[1]|2]:RADio:ARB:CLOCk:REFerence[:SOURce]?
```

**Response**

```
<source>  INT, EXT, EXTS or SYNC
```

**Parameter**

```
<source>
INTERNAL  Baseband signal reference clock
INTernal  Int (Default)
EXTERNAL  Ext
EXTSync  Ext (BB Ref Sync)
SYNC  Sync with 1st SG
```

**Programming Example**

To set the baseband signal reference clock to Ext.

```plaintext
RAD:ARB:CLOC:REF  EXT
RAD:ARB:CLOC:REF?
>  EXT
```
Clock division ratio: 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.

<table>
<thead>
<tr>
<th>Sampling Rate [MHz]</th>
<th>Baseband Reference Clock Division setting range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16</td>
</tr>
<tr>
<td>0.02 ≤ f ≤ 0.048828125</td>
<td>✓</td>
</tr>
<tr>
<td>0.048828125 &lt; f ≤ 0.09765625</td>
<td>✓</td>
</tr>
<tr>
<td>0.09765625 &lt; f ≤ 0.1953125</td>
<td>✓</td>
</tr>
<tr>
<td>0.1953125 &lt; f ≤ 0.390625</td>
<td>✓</td>
</tr>
<tr>
<td>0.390625 &lt; f ≤ 3.125</td>
<td>✓</td>
</tr>
<tr>
<td>3.125 &lt; f ≤ 6.25</td>
<td>✓</td>
</tr>
<tr>
<td>6.25 &lt; f ≤ 12.5</td>
<td>✓</td>
</tr>
<tr>
<td>12.5 &lt; f ≤ 25</td>
<td>✓</td>
</tr>
<tr>
<td>25 &lt; f ≤ 50</td>
<td>✓</td>
</tr>
<tr>
<td>50 &lt; f ≤ 100</td>
<td>✓</td>
</tr>
<tr>
<td>100 &lt; f ≤ 200</td>
<td>✓</td>
</tr>
</tbody>
</table>

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:CLK: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> Baseband signal reference clock
| SIXTeenth | Sampling Clock × 1/16
| EIGHth | Sampling Clock × 1/8
| QUARter | Sampling Clock × 1/4
| HALF | Sampling Clock × 1/2
| X1 | Sampling Clock × 1
| X2 | Sampling Clock × 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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Top&gt;Mode, ➔Baseband Clock&gt;Out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enables/disables the Baseband clock reference output.</td>
</tr>
</tbody>
</table>

This cannot be used in MG3740A.

Press F3 Out on the Baseband Clock function menu for setting.

This is a shared parameter for each SG. It can be set when either SG1 is in the modulation output status when SG1 is installed or when SG2 is in the modulation output status when SG2 is installed (when waveform selection is Mod=On).

Setting range

- Off: Outputs the Baseband clock reference (Default).
- On: Does not output the Baseband clock reference.

Remote command

Output the Baseband clock reference

Command

```
[:SOURce]:RADio:ARB:CLOCk:REFerence:OUTPut <boolean>
```

Query

```
[:SOURce]:RADio:ARB:CLOCk:REFerence:OUTPut?
```

Response

```
<boolean> 0 or 1
```

Parameter

```
<boolean> Frequency relative display On/Off
  OFF|0 Outputs the Baseband clock reference (Default).
  ON|1 Does not output the Baseband clock reference.
```

Programming Example

To output the Baseband clock reference.

```
RAD:ARB:CLOC:REF:OUTP ON
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>  Sampling clock

Range  140 MHz to 200 MHz

Resolution  0.001 Hz

**Programming Example**

To query the sampling clock.

RAD:ARB:SCL:RATE?

>140000000.000
7.3 Baseband Mode

7.3.12 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.

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.

### Table 7.3.12-2  Marker 1 A Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Edit Mode Off On  Sync</td>
<td>Enables/disables the Marker 1 edit function. When set to On/Sync, Marker bit in Pattern is disabled.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Offset 0.00</td>
<td>Sets Offset from the top output of Pattern to Marker 1 output timing.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Width 1.00</td>
<td>Sets the output width of Marker 1.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Cycle 1.00</td>
<td>Sets the output cycle of Marker 1.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Polarity Positive Negative</td>
<td>Sets the output polarity of Marker 1.</td>
</tr>
</tbody>
</table>

![Pattern start position Diagram](image)

**Figure 7.3.12-2  Offset, Width, Cycle**

![Polarity Diagram](image)

**Figure 7.3.12-3  Polarity**
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.

**Notes:**

- For the method to edit Marker bit in the pattern, refer to *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

- OFF 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 OFF|0.
  - 16-bit resolution: Markers 1 to 3 cannot be set to OFF|0.

**Remote command**

**Enable/disable the Marker 1/2/3 edit function**

**Command**

```
[:SOURce[1]|2]:RADio:ARB:WMAR:MARKer1|2|3:EDIT[:STATe <boolean>|PATSync]
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:WMAR:MARKer1|2|3:EDIT[:STATe ]?
```

**Response**

```
<mode> 0,1 or PATS
```
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Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>1</td>
</tr>
<tr>
<td>OFF</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Outputs the marker previously recorded in the waveform pattern.</td>
</tr>
<tr>
<td>PATSync</td>
<td>Outputs the marker at the start of the waveform pattern.</td>
</tr>
</tbody>
</table>

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 OFF|0.
- 16-bit resolution: Markers 1 to 3 cannot be set to OFF|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

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

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower limit</td>
<td>0</td>
</tr>
<tr>
<td>Upper limit</td>
<td>((2^{24} - 1) \div \text{OverSampling A/B}) (Rounded to two decimal places)</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 [System Unit A/B]</td>
</tr>
<tr>
<td>Default</td>
<td>0</td>
</tr>
</tbody>
</table>

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

<ext_numeric>

Query


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:WM*:MARK2:EDIT:OFFS 100

RAD:ARB:WM*:MARK2:EDIT:OFFS?

> 100.00

Output width: 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 to two decimal places)
### Upper limit

When Marker1/2/3 Edit Mode A/B is set to “On”:

\[
\frac{2^{24} - 1}{\text{OverSampling A/B (Rounded to two decimal places)}}
\]

or Marker1/2/3 Cycle A/B, whichever smaller

When Marker1/2/3 Edit Mode A/B is set to “Sync”:

\[
\frac{2^{24} - 1}{\text{OverSampling A/B (Rounded to two decimal places)}}
\]

or DataPoint A/B ÷ OverSampling A/B, whichever smaller

### Resolution

**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)

**DataPoint A/B**

Waveform pattern cycle

---

### Remote command

**Set the Marker 1/2/3 output pulse width**

**Command**

\[ [:\text{SOUR}ce[1]|2]:\text{RADio}:\text{ARB}:\text{WM}\text{A|WMB:MARKer1|2|3}:EDIT:WIDTh <\text{ext\_numeric}> \]

**Query**

\[ [:\text{SOUR}ce[1]|2]:\text{RADio}:\text{ARB}:\text{WM}\text{A|WMB:MARKer1|2|3}:EDIT:WIDTh? \]

**Response**

<\text{ext\_numeric}>

**Parameter**

\(<\text{ext\_numeric}>\) 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.

\[ \text{RAD:ARB:WMA:MARK2:EDIT:WIDT} 50 \]

\[ \text{RAD:ARB:WMA:MARK2:EDIT:WIDT?} \]

> 50.00
7.3 Baseband Mode

Cycle

Sets the output cycle of Marker.

In MG3740A, this can be used only when option-020/120 is installed.

Press **F4 Cycle** on the Marker 1/2/3 A(B) function menu for setting.

Setting range

- **Lower limit**: \( \frac{1}{\text{OverSampling A/B}} \) (Rounded to two decimal places)
- **Upper limit**: \( \frac{2^{24} - 1}{\text{OverSampling A/B}} \) (Rounded 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**

```
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:WM|WMB:MARKer1|2|3:EDIT:CYCLe?
```

**Response**

```
<ext_numeric>
```

**Parameter**

- **Output pulse cycle**: <ext_numeric>
- **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:WM:MARK2:EDIT:CYCL 200
RAD:ARB:WM:MARK2:EDIT:CYCL?
> 200.00
```
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**

```
```

**Query**

```
```

**Response**

<polarity>  POS or NEG

**Parameter**

<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

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 Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).

Press **F7 Sequence Mode** on page 2 of ARB/Waveform function menu to open the **Sequence Progress** dialog box and Sequence Mode function menu.

![Sequence Progress Dialog Box](image)

**Figure 7.3.13-1  Sequence Progress Dialog Box**

<table>
<thead>
<tr>
<th>Index</th>
<th>Package Name</th>
<th>Pattern Name</th>
<th>Repeat</th>
<th>Frequency Offset</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top</td>
<td>Top</td>
<td>1</td>
<td>0 Hz</td>
<td>0 dB</td>
</tr>
<tr>
<td>2</td>
<td>TestWec2</td>
<td>BBDCp1</td>
<td>1</td>
<td>0 Hz</td>
<td>0 dB</td>
</tr>
<tr>
<td>3</td>
<td>Test</td>
<td>BBDC</td>
<td>1</td>
<td>0 Hz</td>
<td>0 dB</td>
</tr>
</tbody>
</table>

**Total : 3**

**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.
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**Note:**

For Add Pattern, refer to 4.8.2 “Combination File Edit screen” in *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

<table>
<thead>
<tr>
<th>Table 7.3.13-1  Sequence Mode Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**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

Restarts the elements from the top in the sequence mode.

In MG3740A, this can be used only when option 020/120 is installed.

Press **F2 Sequence Restart** on the Sequence Mode function menu for execution.

**Remote command**

**Restart the elements from the top in the sequence mode**

**Command**


**Related command**

Use the following command to obtain the play status and to wait for completion.


**Programming Example**

To restart SG1 output elements from the top in the sequence mode.

`INIT:ARB:SEQ`

**Remote command**

**Query the playback status of the sequence mode**

**Query**


**Response**

<status>

**Parameter**

<table>
<thead>
<tr>
<th>&lt;status&gt;</th>
<th>Playback status</th>
</tr>
</thead>
<tbody>
<tr>
<td>bit2 : 2^2 = 4</td>
<td>(0: Paused, 1: Playback)</td>
</tr>
<tr>
<td>bit0, 1, 3 to 15</td>
<td>Not used</td>
</tr>
</tbody>
</table>

**Details**

“Playing” is returned during trigger waiting.

**Related command**

Use the following command for the pattern play status.


**Programming Example**

To query the SG1 output play status in the sequence mode.

`RAD:ARB:SEQ:REG?`

> 4
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

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**

```
```

**Query**

```
INITiate[1]|2:ARB:SEQUence:CONTinuous[:ALL]?
```

**Response**

```
<boolean> 0 or 1
```

**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

Query
<integer>

Response
<ext_integer>

Parameter
<integer>  Index
Range     1 to 200
Default   1
Suffix code  None

<ext_integer>  RepeatCount
Range       0 to 65535
Resolution  1
Default     0
Suffix code  None

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

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 Info Dialog Box](image)

### Table 7.3.14-1 Pattern Trigger Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Pattern Trigger Off On</td>
<td>Sets whether the trigger is to be used or not to be used for Sequence Mode pattern switching.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Pattern Trigger 1</td>
<td>Displays the Pattern Trigger 1 function menu.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pattern Trigger 2</td>
<td>Displays the Pattern Trigger 2 function menu.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Pattern Trigger 3</td>
<td>Displays the Pattern Trigger 3 function menu.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Switching Point Pattern Frame</td>
<td>Selects the switching timing to move to the next element on pattern trigger input.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Trigger Key</td>
<td>Generates Pattern Trigger manually. This is executable only from this menu. When Pattern Trigger Source is Trigger Key, executing this function applies the trigger.</td>
</tr>
</tbody>
</table>
Pattern Trigger

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**

```
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:SEQUence:TRIGger[:STATe]? 
```

**Response**

```
<boolean>  0 or 1
```

**Parameter**

```
<boolean>  Trigger On/Off
OFF|0  Uses the trigger.
ON|1  Does not use the trigger (Default).
```

**Programming Example**

To use the trigger for Sequence Mode pattern switching.

```
RAD:ARB:SEQ:TRIG ON
RAD:ARB:SEQ:TRIG?
> 1
```
7.3 Baseband Mode

Pattern Trigger 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.

Table 7.3.14-2 Pattern Trigger 1 Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Pattern Trigger 1</td>
<td>Enables/disables the pattern trigger 1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Source</td>
<td>Sets the trigger source of the pattern trigger 1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ext</td>
<td>Bus</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Edge</td>
<td>Sets the edge of the pattern trigger 1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rise</td>
<td>Fall</td>
</tr>
</tbody>
</table>

Pattern Trigger 1/2/3 On/Off: Pattern Trigger 1/2/3

Sets 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

```plaintext
[:SOURce1]|2]:RADio:ARB:SEQUence:TRIGger1|2|3:STATe <boolean>
```

Query

```plaintext
[:SOURce1]|2]:RADio:ARB:SEQUence:TRIGger1|2|3:STATe?
```

Response

<boolean> 0 or 1
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Parameter

<boolean>  
OFF|0  Disables the pattern trigger 1/2/3 (Default).  
ON|1  Enables 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

Query
[:SOURce[1]|2]:RADio:ARB:SEQuence:TRIGger1|2|3:SOURce?

Response

<mode>  EXT, BUS or KEY

Parameter

<mode>  Trigger source

EXT  Terminal set to PatternTrig1/2/3 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.

<table>
<thead>
<tr>
<th>Status</th>
<th>Pattern Status 1</th>
<th>Pattern Status 2</th>
<th>Pattern Status 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>1</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>5</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>6</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>7</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
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Edge

Edge or Top>Mode, >Sequence Mode>PatterTrigger

PatternTrigger 1/2/3>Edge

Sets the pattern trigger 1/2/3 edge.

In MG3740A, this can be used only when option-020/120 is installed.

Press F3 Edge on the Pattern Trigger 1/2/3 function menu for setting.

Rise  Applies the trigger at the signal rising. (Default)
Fall   Applies the trigger at the signal falling.

Remote command

Set the pattern trigger 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>  POS or NEG

Parameter

<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 Example

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?
>  POS
7.3 Baseband Mode

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 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.

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
Chapter 7  Modulation

Parameter

<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

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

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 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 are used, 8x8 MIMO system configuration will be available.

This function allows easy setting necessary for the synchronization system configuration with multiple MG3710As. (The Local signal input/output and baseband lock input/output require the Universal Input/Output option.)

**Note:**

When several MG3710A units are connected, sometimes the output level of the MG3710A 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 LO Input connector.
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**Common Setting**
- Number of Slaves: 3
- LO Sync: On

**Ext Trig**  Start Frame TRIG Input

1. **Buffer Output**
   - to REF Input

2. **BB REF CLK Output**
   - to BB REF CLK Input

3. **LO Output**
   - to LO Input

4. **Sync Trigger Output**
   - to SG1 S/F Trigger Input

---

**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/timing synchronization must be executed again. (When ATT Hold = 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 units, connect them as shown.

When synchronizing several MG3710A 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 Slaves, Slave Position, and LO Sync at each SG.

**Note:**

When several MG3710A units are connected, sometimes the output level of the MG3710A 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 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](image-url)
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 pattern: Same setting (arbitrary waveform pattern)
ATT Hold: On

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.

![Sync Multi SG Diagram](image)

**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.
## Table 7.3.15-1  Sync Multi SG Display Contents

<table>
<thead>
<tr>
<th>No.</th>
<th>Display Example</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image" alt="Master" /> <img src="image" alt="Slave#1" /> <img src="image" alt="Slave#2" /> <img src="image" alt="Slave#3" /></td>
<td>Master, Slave#1 to Slave#3</td>
<td>Displays the order of connecting MG3710A units when using several MG3710A units. This is displayed when Sync Type is Master or Slave. The number of Slaves displayed depends on the “Number of Slaves” setting.</td>
</tr>
<tr>
<td>2</td>
<td><img src="image" alt="LO Input" /></td>
<td>LO Input</td>
<td>Indicates the Local signal source is set to Ext (input from the rear LO Input connector).</td>
</tr>
<tr>
<td>3</td>
<td><img src="image" alt="SG1" /> <img src="image" alt="I/Q Phase" /> <img src="image" alt="I/Q Delay" /></td>
<td>SG1</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td><img src="image" alt="SG2" /> <img src="image" alt="I/Q Phase" /> <img src="image" alt="I/Q Delay" /></td>
<td>SG1</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td><img src="image" alt="LO Source Ext" /></td>
<td>LO Source (SG1)</td>
<td>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.</td>
</tr>
<tr>
<td>6</td>
<td><img src="image" alt="LO Source Sync" /></td>
<td>LO Source (SG2)</td>
<td>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.</td>
</tr>
<tr>
<td>7</td>
<td><img src="image" alt="1st RF Output" /></td>
<td>1st RF Output</td>
<td>Indicates that the RF Output of SG1 is On.</td>
</tr>
<tr>
<td>8</td>
<td><img src="image" alt="2nd RF Output" /></td>
<td>2nd RF Output</td>
<td>Indicates that the RF Output of SG2 is On.</td>
</tr>
<tr>
<td>9</td>
<td><img src="image" alt="LO Output" /></td>
<td>LO Output</td>
<td>Indicates the Local signal external output setting (output from the rear LO Output connector) is On.</td>
</tr>
</tbody>
</table>
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.

Table 7.3.15-2  Sync Multi SG Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Sync Type</td>
<td>Sets the synchronization mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Number of Slaves</td>
<td>Sets the number of connected Slaves. This is enabled when SyncType is Master or Slave.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Slave Position</td>
<td>Sets the position of MG3710A when SyncType is Slave. This is enabled when SyncType is or Slave. It is used for setting judgment such as the case Lo Out is set to Off for connection termination.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>LO Sync</td>
<td>Enables/disables the Local synchronization. This is used to synchronize signal phases from SGs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Sync</td>
<td>Starts synchronization for multiple SGs. This is enabled when SyncType is Master or Slave.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Waveform Restart</td>
<td>Simultaneously restarts each waveform pattern selected by SG1 and SG2 when SG2 (Option 062/162, 064/164 or 066/166) is installed.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>I/Q Phase</td>
<td>Adjusts the Baseband signal phase. This is used to adjust multiple SGs signal phases with MIMO or beam forming.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 deg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>I/Q Delay</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.000000000000 s</td>
<td></td>
</tr>
</tbody>
</table>

**Sync Type**

![Mode](image) 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).

**Master**

Synchronizes multiple SGs. MG3710A is positioned as Master. When SG2 is installed, SG1 and SG2 are synchronized.

**Slave**

Synchronizes multiple SGs. MG3710A is positioned as Slave. When SG2 is installed, SG1 and SG2 are synchronized.

**SG1 & SG2**

Synchronizes SG1 and SG2 of MG3710A.
Remote command

Set the synchronization mode

Command

[:SOURce]:RADio:ARB:MBSYnc OFF|SG12|MASTer|SLAVe

Query

[:SOURce]:RADio:ARB:MBSYnc?

Response

<mode> OFF, SG12, MAST or SLAV

Parameter

<mode> Synchronization mode

OFF Does not execute synchronization (Default).

MAST Synchronizes multiple SGs. MG3710A is positioned as Master. When SG2 is installed, SG1 and SG2 are synchronized.

SLAV Synchronizes multiple SGs. MG3710A is positioned as Slave. When SG2 is installed, SG1 and SG2 are synchronized.

SG12 Synchronizes SG1 and SG2 of MG3710A.

Programming Example

To set to the mode to synchronizes SG1 and SG2 of MG3710A.

RAD:ARB:MBSY SG12
RAD:ARB:MBSY?
> SG12

Number of Slaves

Sets the number of connected Slaves. This is enabled when SyncType is Master or Slave.

Press F2 Number of Slaves on the Sync Multi SG function menu for setting.

Range 1 to 3
Resolution 1
Default 1
### 7.3 Baseband Mode

#### Remote command

**Set the number of connected Slaves**

**Command**

`[:SOURce]:RADio:ARB:MBSYnc:NSLaves <ext_integer>`

**Query**

`[:SOURce]:RADio:ARB:MBSYnc:NSLaves?`

**Response**

`<ext_integer>`

**Parameter**

- `<ext_integer>`: The number of connected Slaves
- **Range**: 1 to 3
- **Resolution**: 1
- **Default**: 1
- **Suffix code**: None

**Programming Example**

To set the number of connected Slaves to 2.

```
RAD:ARB:MBSY:NSL 2
RAD:ARB:MBSY:NSL?
> 2
```

#### Slave Position

**Mode** or **Top>Mode, > Sync Multi SG>Slave Position**

Sets the position of MG3710A when SyncType is Slave. This is enabled when SyncType is or Slave. It is used for setting judgment such as the case Lo Out is set to Off for connection termination.

Press **F3 Slave 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 when SyncType is Slave

Command
[:SOURce]:RADio:ARB:MBSYnc:SREFerence <ext_integer>

Query
[:SOURce]:RADio:ARB:MBSYnc:SREFerence?

Response
<ext_integer>

Parameter
<ext_integer> Position of MG3710A
Range 1 to 3
Resolution 1
Default 1
Suffix code None

Programming Example
To set the position of MG3710A when SyncType is Slave 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.
7.3 Baseband Mode

Remote command  
Enable/disable the Local synchronization

Command

\[ [:\text{SOURce}]:\text{RADio}:\text{ARB}:\text{MBSync}:\text{LOSync} \ <\text{boolean}> \]

Query

\[ [:\text{SOURce}]:\text{RADio}:\text{ARB}:\text{MBSync}:\text{LOSync}? \]

Response

\(<\text{boolean}>\)  0 or 1

Parameter

\(<\text{boolean}>\)          Local synchronization On/Off
\text{OFF}|0        Does not execute Local synchronization (Default).
\text{ON}|1        Executes Local synchronization.

Programming Example

To set the Local synchronization to On.
RAD:ARB:MBSY:LOSY ON
RAD:ARB:MBSY:LOSY?
> 1

Sync

Mode or Top>Mode, >Sync Multi SG>Sync
Synchronization for multiple SGs is started. This is enabled when SyncType is Master or Slave.

To start the signal 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 Master SG.

Press F5 Sync on the Sync Multi SG function menu for setting.

Remote command  
Start synchronization for multiple SGs

Command

\[ [:\text{SOURce}]:\text{RADio}:\text{ARB}:\text{MBSync}:\text{SSLaves} \]

Programming Example

To start synchronization for multiple SGs.
RAD:ARB:MBSY:SSL
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.

Press **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
7.3 Baseband Mode

I/Q Phase

![Mode](image) or **Top>Mode, Sync Multi SG> I/Q Phase**

Adjusts the Baseband signal IQ phase.

This is used to adjust 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 Phase** 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 Baseband signal IQ phase**

**Command**

```plaintext
[:SOURce[1]|2]:DM:IQADjustment:PHASe <phase>
```

**Query**

```plaintext
[:SOURce[1]|2]:DM:IQADjustment:PHASe?
```

**Response**

- **<phase>**  
  Unit: deg

**Parameter**

- **<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.

```plaintext
DM:IQAD:PHAS 5
DM:IQAD:PHAS?
> 5.00
```
Chapter 7  Modulation

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 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 ps
- **Default**  
  0 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?
> 0.000000300000
```
7.4 Route Connectors

Sets signals of the input and output connectors. This setting is common for the entire MG3710A/MG3740A.

Press **F4 Route Connectors** on page 2 of the top function menu to open the Route Connectors function menu.

### Table 7.4-1 Route Connectors Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Route Input Connectors</td>
<td>Displays the Input Connectors function menu to set the input signals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 7.4.1 “Route Input Connectors”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Route Output Connectors</td>
<td>Displays the Output Connectors function menu to set the output signals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 7.4.2 “Route Output Connectors”.</td>
</tr>
</tbody>
</table>
7.4.1 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>S/F Trigger</td>
<td>Selects the signal input to the Start/Frame Trigger Input connector.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Pattern Trigger 1</td>
<td>Selects the signal input to the Pattern Trigger 1 Input connector.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pattern Trigger 2</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Pattern Trigger 3</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Pattern Status 1</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Pulse Mod</td>
<td>Selects the signal input to the Pulse Mod terminal of AUX connector.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Pattern Trigger Type Shared Ind</td>
<td>Sets the usage of PatternTrigger 1, 2, 3, and PatternStatus1. This is available in MG3740A only when option-020/120 is installed.</td>
</tr>
</tbody>
</table>
### 7.4 Route Connectors

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, MG3740A installed option-020/120)**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>SG1 S/F Trigger</td>
<td>Handles the input signal as S/F Trigger for SG1. Refer to 7.3.8 “Start/Frame Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>SG2 S/F Trigger</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pattern Trigger 1</td>
<td>Handles the input signal as Pattern Trigger 1/Point Trigger. Refer to 7.3.14 “Pattern Trigger”. Refer to 6.5 “Point Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Pattern Trigger 2</td>
<td>Handles the input signal as Pattern Trigger 2/Pattern Status 2. Refer to 7.3.14 “Pattern Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Pattern Trigger 3</td>
<td>Handles the input signal as Pattern Trigger 3/Pattern Status 3. Refer to 7.3.14 “Pattern Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Pattern Status 1</td>
<td>Handles the input signal as Pattern Status 1. Refer to 7.3.14 “Pattern Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>SG1 Pulse Mod</td>
<td>Handles the input signal as SG1 Pulse Mod. Menu Display is <strong>Pulse Mod</strong> when option-062/064/066/162/164/166 is not installed. Refer to 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>SG2 Pulse Mod</td>
<td>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”.</td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Off</td>
<td>Does not use the input signal.</td>
</tr>
</tbody>
</table>
### Table 7.4.1-3  Input Connector Function Menu (MG3740A not installed option-020/120)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Off</td>
<td>Does not use the input signal.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Pattern Trigger 1</td>
<td>Handles the input signal as Pattern Trigger 1/Point Trigger. Refer to 7.3.14 “Pattern Trigger”. Refer to 6.5 “Point Trigger”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>SG1 Pulse Mod</td>
<td>Handles the input signal as SG1 Pulse Mod. Menu Display is [Pulse Mod] when option-062/064/066/162/164/166 is installed. Refer to 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>SG2 Pulse Mod</td>
<td>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”.</td>
</tr>
</tbody>
</table>

### 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, 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>`
7.4 Route Connectors

Parameter
<signal>  Signal input to the S/F Trigger connector
Options  Refer to the table below.

Table 7.4.1-4  Input Connector

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Signal to be input</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFT</td>
<td>SG1 S/F Trigger</td>
<td>Default (MG3710A, MG3740A-020/120) In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2SFT</td>
<td>SG2 S/F Trigger</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PT1</td>
<td>Pattern Trigger 1</td>
<td></td>
</tr>
<tr>
<td>PT2</td>
<td>Pattern Trigger 2</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PT3</td>
<td>Pattern Trigger 3</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PS1</td>
<td>Pattern Status 1</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PM</td>
<td>SG1 Pulse Mod</td>
<td></td>
</tr>
<tr>
<td>SG2PM</td>
<td>SG2 Pulse Mod</td>
<td></td>
</tr>
<tr>
<td>OFF</td>
<td>Off</td>
<td>Default (MG3740A when option-020/120 not installed)</td>
</tr>
</tbody>
</table>

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

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, 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|PT3|PS1|PM|SG2PM|OFF

Query
:ROUTe[:CONNectors]:INPut:TRIGger:PATTern1?

Response
<signal>

Parameter
<signal>  Signal input to the Pattern Trigger 1 connector

Options  Listed in Table 7.4.1-3 “Input Connector”.

Default  PT1 (MG3710A, MG3740A-020/120)
          OFF
          (MG3740A, when option-020/120 not installed)

Programming Example
To set the signal input to the Pattern Trigger 1 connector to SG1 S/F Trigger.
ROUT:INP:TRIG:PATT1 SFT
ROUT:INP:TRIG:PATT1?
> SFT

Pattern Trigger 2

Top>Route Connectors>Route Input Connectors>Pattern Trigger 2

Selects the signal input to the Pattern Trigger 2 connector.
In MG3740A, this can 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  Listed in Table 7.4.1-2 “Input Connector Function Menu”.

Default  Pattern Trigger 2
7.4 Route Connectors

Remote command

Select the signal input to the Pattern Trigger 2 connector

Command

:ROUTE[:CONNectors]:INPut:TRIGger:PATTern2
SFT|SG2SFT|PT1|PT2|PT3|PS1|PM|SG2PM|OFF

Query

:ROUTE[:CONNectors]:INPut:TRIGger:PATTern2?

Response

<signal>

Parameter

<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

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

Remote command

Select the signal input to the Pattern Trigger 3 connector

Command

:ROUTE[:CONNectors]:INPut:TRIGger:PATTern3
SFT|SG2SFT|PT1|PT2|PT3|PS1|PM|SG2PM|OFF

Query

:ROUTE[:CONNectors]:INPut:TRIGger:PATTern3?
Chapter 7  Modulation

Response
<signal>

Parameter
<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:INF:TRIG:PATT3 SFT
ROUT:INF: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 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[:CONNectors]:INPut:STATUs:PATTern1
SFT|SG2SFT|PT1|PT2|PT3|PS1|PM|SG2PM|OFF

Query
:ROUTE[:CONNectors]:INPut:STATUs:PATTern1?

Response
<signal>

Parameter
<signal>  Signal input to the Pattern Status 1 connector
Options  Listed in Table 7.4.1-3 “Input Connector”.
Default   PS1
7.4 Route Connectors

Programming Example
To set the signal input to the Pattern Status 1 connector to SG1 S/F Trigger.
ROUT:INP:STAT:PATT1 SFT
ROUT:INP:STAT:PATT1?
> SFT

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 input to the Pulse Mod connector

**Command**
:ROUTE[:CONNECTors]:INPut:PLUM
SFT|SG2SFT|PT1|PT2|PT3|PS1|PM|SG2PM|OFF

**Query**
:ROUTE[:CONNECTors]:INPut:PLUM?

**Response**
<signal>

**Parameter**
<signal> Signal input to the Pulse Mod connector

Options
- Listed in Table 7.4.1-3 “Input Connector”.

Default
- PM

Programming Example
To set the signal input to the Pulse Mod connector to SG1 S/F Trigger.
ROUT:INP:PLUM SFT
ROUT:INP:PLUM?
> SFT

Pattern Trigger Type

Top->Route Connectors->Route Input Connectors->Pattern Trigger
Chapter 7  Modulation

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.

**Shared**
PatternTrig1,2,3 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 PatternTrig1,2,3 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.

**Remote command**
Select the usage of PatternTrig1, 2, 3, and PatternStatus1

**Command**
:ROUTE[:CONNectors]:INPut:TRIGger:PATTern:TYPE
7.4 Route Connectors

SHARE|DIVide

Query
:ROUTE[:CONNECTORS]:INPUT:TRIGGER:_PATTERN:TYPE?

Response
<mode> SHAR or DIV

Parameter
<mode>
SHARE Shared (Default)
DIVide Independent

Programming Example
To set the usage of PatternTrig 1, 2, 3 and PatternStatus1 to Independent.
ROUT:INPUT:TRIGGER:_PATTERN DIV
ROUT:INPUT:TRIGGER:_PATTERN?
> DIV
7.4.2 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.

### Table 7.4.2-1 Output Connectors Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Marker 1</td>
<td>Sets the signal output from the Marker 1 Output connector.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Marker 2</td>
<td>Sets the signal output from the Marker 2 terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Marker 3</td>
<td>Sets the signal output from the Marker 3 terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Pulse Video</td>
<td>Sets the signal output from the Pulse Video terminal of AUX connector.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Pulse Sync</td>
<td>Sets the signal output from the Pulse Sync terminal of AUX connector.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Sync Trig Out</td>
<td>Sets the signal output from the Sync Trig Out terminal of AUX connector. This is available in MG3740A only when option-020/120 is installed.</td>
</tr>
</tbody>
</table>

Setting each output connector

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, MG3740A installed option-020/120)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>SG1 Marker 1 A</td>
<td>Outputs SG1 Waveform Memory A side Marker 1 signal. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>SG1 Marker 2 A</td>
<td>Outputs SG1 Waveform Memory A side Marker 2 signal. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>SG1 Marker 3 A</td>
<td>Outputs SG1 Waveform Memory A side Marker 3 signal. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>SG1 Marker 1 B</td>
<td>Outputs SG1 Waveform Memory B side Marker 1 signal. This is not displayed when the option 048/148 is not installed. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>SG1 Marker 2 B</td>
<td>Outputs SG1 Waveform Memory B side Marker 2 signal. This is not displayed when the option 048/148 is not installed. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>SG1 Marker 3 B</td>
<td>Outputs SG1 Waveform Memory B side Marker 3 signal. This is not displayed when the option 048/148 is not installed. Refer to 7.3.12 &quot;Marker Setup&quot;.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>SG1 Pulse Sync</td>
<td>Outputs the signal synchronized with SG1 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3740A is to be executed. Refer to Figure 7.4.2-3 “SG1/2 Pulse Sync” and 7.2.3 “Pulse”</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>SG1 Pulse Video</td>
<td>Outputs the signal synchronized with SG1 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3710A/MG3740A is to be executed. Refer to Figure 7.4.2-4 “SG1/2 Pulse Video” and 7.2.3 “Pulse”</td>
</tr>
</tbody>
</table>
### Table 7.4.2-2 Marker Connector Function Menu
(MG3710A, MG3740A installed option-020/120 (Cont’d))

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
</table>
| 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/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/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/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/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/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/MG3740A.  
Refer to 7.3.14 “PatternTrigger Pattern Status”. |
|      | F7      | 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”. |
|      | 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”.

---

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### Table 7.4.2-2  Marker Connector Function Menu  
(MG3710A, MG3740A installed option-020/120 (Cont’d))

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>F1</td>
<td>SG2 Marker 2 A</td>
<td>Outputs SG2 Waveform Memory A side Marker 2 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”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>SG2 Marker 3 A</td>
<td>Outputs SG2 Waveform Memory A side Marker 3 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”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>SG2 Marker 1 B</td>
<td>Outputs SG2 Waveform Memory B side Marker 1 signal. This is not displayed when the option 078/178 is not installed. Refer to 7.3.12 “Marker Setup”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>SG2 Marker 2 B</td>
<td>Outputs SG2 Waveform Memory B side Marker 2 signal. This is not displayed when the option 078/178 is not installed. Refer to 7.3.12 “Marker Setup”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>SG2 Marker 3 B</td>
<td>Outputs SG2 Waveform Memory B side Marker 3 signal. This is not displayed when the option 078/178 is not installed. Refer to 7.3.12 “Marker Setup”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>SG2 Pulse Sync</td>
<td>Outputs the signal synchronized with SG2 Pulse cycle. This is used when the measurement synchronized with the pulse modulation of the MG3710A/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” and 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>SG2 Pulse Video</td>
<td>Outputs the signal synchronized with SG2 Pulse On interval. This is used when the measurement synchronized with the pulse modulation of the MG3710A/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”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>SG2 Settled</td>
<td>Outputs the settling signal of SG2. This is used when the measurement synchronized with the signal transmission after frequency switching or others of the MG3710A/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”.</td>
</tr>
</tbody>
</table>
Table 7.4.2-3  Marker Connector Function Menu (MG3740A not installed option-020/120)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>SG1 Pulse Sync</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>SG1 Pulse Video</td>
<td>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” and 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>SG1 Settled</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Point Trigger</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>SG2 Pulse Sync</td>
<td>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” and 7.2.3 “Pulse”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>SG2 Pulse Video</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>SG2 Settled</td>
<td>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”.</td>
</tr>
</tbody>
</table>
**7.4 Route Connectors**

**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.

![Diagram of Sync Trigger Out](image)

**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:** Output level is TTL.
Outputs the signal at the timing of switching of Sweep/List function sweep point.

![Diagram of Point Trigger Out](image)
**SG1/2 Pulse Sync:** Output level is TTL.
Outputs the signal synchronized with the start position of the pulse modulation cycle.

![Figure 7.4.2-3  SG1/2 Pulse Sync](image)

**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](image)

**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
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, 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[:CONNections]:OUTPut:MARKer1
M1A|M1B|M2A|M2B|M3A|M3B|SG2M1A|SG2M1B|SG2M2A|SG2M2B|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET

**Query**
:ROUTE[:CONNections]:OUTPut:MARKer1?

**Response**

**Parameter**

- **<mode>** Signal to be output
- **Options** Refer to the table below.
## Table 7.4.2-4  Marker Connector

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Signal to be output</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1A</td>
<td>SG1 Marker 1 A</td>
<td>Default (MG3710A, MG3740A-020/120) In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>M2A</td>
<td>SG1 Marker 2 A</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>M3A</td>
<td>SG1 Marker 3 A</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>M1B</td>
<td>SG1 Marker 1 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>M2B</td>
<td>SG1 Marker 2 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>M3B</td>
<td>SG1 Marker 3 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PSY</td>
<td>SG1 Pulse Sync</td>
<td></td>
</tr>
<tr>
<td>PVID</td>
<td>SG1 Pulse Video</td>
<td></td>
</tr>
<tr>
<td>SET</td>
<td>SG1 Settled</td>
<td></td>
</tr>
<tr>
<td>SYNC</td>
<td>Sync Trigger Out</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PT1</td>
<td>Pattern Trigger 1 Out</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PT2</td>
<td>Pattern Trigger 2 / Pattern Status 2</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PT3</td>
<td>Pattern Trigger 3 / Pattern Status 3</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>PS1</td>
<td>Pattern Status 1</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>POINT</td>
<td>Point Trigger</td>
<td>Default (MG3740A when option-020/120 is not installed)</td>
</tr>
<tr>
<td>SG2M1A</td>
<td>SG2 Marker 1 A</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2M2A</td>
<td>SG2 Marker 2 A</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2M3A</td>
<td>SG2 Marker 3 A</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2M1B</td>
<td>SG2 Marker 1 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2M2B</td>
<td>SG2 Marker 2 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2M3B</td>
<td>SG2 Marker 3 B</td>
<td>In MG3740A, this cannot be selected when option-020/120 is not installed.</td>
</tr>
<tr>
<td>SG2PSY</td>
<td>SG2 Pulse Sync</td>
<td></td>
</tr>
<tr>
<td>SG2PVID</td>
<td>SG2 Pulse Video</td>
<td></td>
</tr>
<tr>
<td>SG2SET</td>
<td>SG2 Settled</td>
<td></td>
</tr>
</tbody>
</table>
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: Marker 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
**Select the signal output from the Marker 2 connector**

**Command**
```
:ROUTE[:CONNectors]:OUTPut:MARKer2
M1A|M1B|M2A|M2B|M3A|M3B|SG2M1A|SG2M1B|SG2M2A|SG2M2B|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET
```

**Query**
```
:ROUTE[:CONNectors]:OUTPut:MARKer2?
```

**Response**
```
<mode>
```

**Parameter**
```
<mode> Signal to be output
```

**Options**
Listed in Table 7.4.2-4 “Marker Connector”.

**Default**
M2A

**Programming Example**
To set the signal output from the Marker 2 connector to SG1 Marker 1 A.

```
ROUT:OUTP:MARK2 M1A
ROUT:OUTP:MARK2?
> M1A
```
Marker 3 connector: Marker 3

Top > Route Connectors > Route Output Connectors > Marker 3

Selects the signal output from the Marker 3 connector.
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|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET

Query

:ROUTE[:CONNectors]:OUTPut:MARKer3?

Response

<mode>

Parameter

<mode> Signal to be output

Options Listed in Table 7.4.2-4 “Marker Connector”.

Default M3A

Programming Example

To set the signal output from the Marker 3 connector to SG1 Marker 1 A.

ROUT:OUTP:MARK3 M1A
ROUT:OUTP:MARK3?
> M1A
7.4 Route 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[:CONNectors]::OUTPut:PUlse:VIDeo
M1A|M1B|M2A|M2B|M3A|M3B|SG2M1A|SG2M1B|SG2M2A|SG2M2B|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET

Query

:ROUTe[:CONNectors]::OUTPut:PUlse:VIDeo?

Response

<mode>

Parameter

<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 Marker 1 A.
ROUT:OUTP:PULS:VID M1A
ROUT:OUTP:PULS:VID?
> M1A
Chapter 7  Modulation

Pulse 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|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET

**Query**

```
:ROUTe[:CONNectors]:OUTPut:PULSe:SYNC?
```

**Response**

```
<mode>
```

**Parameter**

```
<mode> Signal to be output
```

**Options**  Listed in Table 7.4.2-4 “Marker Connector”.

**Default**  PSY

**Programming Example**

To set the signal output from the Pulse Sync connector to SG1 Marker 1 A.

```
ROUT:OUTP:FULS:SYNC M1A
ROUT:OUTP:FULS:SYNC?
> M1A
```
Sync Trig Out

Selects the signal output from the Sync Trig Out connector.
In MG3740A, this 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[:CONNections]:OUTPut:SYNC

M1A|M1B|M2A|M2B|M3A|M3B|SG2M1A|SG2M1B|SG2M2A|SG2M2B|SG2M3A|SG2M3B|SYNC|PT1|PT2|PT3|PS1|POINT|PSY|SG2PSY|PVID|SG2PVID|SET|SG2SET

**Query**

:ROUTE[:CONNections]:OUTPut:SYNC?

**Response**

<mode>

**Parameter**

<mode> Signal to be output

Options Listed in Table 7.4.2-4 “Marker Connector”.

Default SYNC

**Programming Example**

To set the signal output from the Sync Trig Out connector to SG1 Marker 1 A.

ROUT:OUTP:SYNC M1A

ROUT:OUTP:SYNC?

> M1A
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-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.

![Waveform pattern](image)

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>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>AWGN Off On</td>
<td>Enables/disables the AWGN.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Noise Bandwidth 128.000000 MHz</td>
<td>Sets the bandwidth of AWGN.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Carrier Level −110.00 dBm</td>
<td>Sets the carrier signal output level.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Noise Level −20.00 dBm</td>
<td>Sets the noise level of the noise bandwidth conversion when no carrier exists, and sets the noise level of the carrier bandwidth conversion when the carrier exists.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>C/N Ratio 40.00 dB</td>
<td>Sets the in-band Noise Power with the ratio to Carrier Power when AWGN is added.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>C/N Set Signal Carrier</td>
<td>Sets the target for level change on CN Ratio change. (The option which is not selected is fixed.)</td>
</tr>
</tbody>
</table>
AWGN On/Off: AWGN

**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> AWGN output On/Off
ON|1 On
OFF|0 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
```
Chapter 7  Modulation

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.

<table>
<thead>
<tr>
<th>Output waveform status</th>
<th>Upper limit</th>
<th>Lower limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, A + AWGN, Long, Long + Awgn</td>
<td>Sampling Rate A × 0.8</td>
<td>Sampling Rate A × 0.2</td>
</tr>
<tr>
<td>B, A + B, Awn, CW No Signal, B + Awn Multi</td>
<td>Sampling Rate B × 0.8</td>
<td>Sampling Rate B × 0.2</td>
</tr>
<tr>
<td>Seq (A), Seq (A + B) Seq (A + Awn)</td>
<td>16 kHz to 160 MHz</td>
<td>16 kHz to 160 MHz</td>
</tr>
</tbody>
</table>

Resolution 1 Hz  
Default 128 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>**
  - Frequency
- **Range**
  - Refer to Table 7.5-2
- **Resolution**
  - 1 Hz
- **Default**
  - 128 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

#### Top>AWGN>Carrier Level

Sets the carrier signal output level.

Press **F3 Carrier Level** 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
- **Resolution**
  - 0.01 dB
- **Default**
  - –110.00 dBm

#### Remote command

**Set the carrier signal output level**

**Command**

```
[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:CARRier <ampl>
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:NOISe:POWer:CARRier?
```

**Response**

- **<ampl>**
  - Unit: dBm

#### Parameter

- **<ampl>**
  - Carrier signal level when AWGN is ON
- **Range**
  - Output level range of MG3710A
- **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?
> –55.00

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.

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
7.5 AWGN

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;ampl&gt;</td>
<td>Output level</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Default</td>
<td>–20 dBm</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DBM, DM, DBUV, DBUVE</td>
</tr>
<tr>
<td></td>
<td>When omitted: DBM</td>
</tr>
</tbody>
</table>

**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**: –40 dB to 40 dB
- **Resolution**: 0.01 dB
- **Default**: 40 dB

![Figure 7.5-4 AWGN Noise Level](image)

**Remote command**

Set the ratio of in-band AWGN Noise Level to Carrier Level when AWGN is On.

**Command**

```
[:SOURce[1]|2]:RADio:ARB:NOISe:CN <rel_ampl>
```

**Query**

```
[:SOURce[1]|2]:RADio:ARB:NOISe:CN?
```

**Response**

```
<rel_ampl> Unit: dB
```
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Parameter

Parameter
<rel_ampl>  C/N
Range  –40 dB to 40 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

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>`: 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
```
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7.6 I/Q Modulation

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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>I/Q Source</td>
<td>Sets the I/Q signal source. This is available in MG3710A only when option-018/118 is installed. This is not available in MG3740A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>I/Q Output</td>
<td>Sets the output destination for baseband signals. This is not available in MG3740A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Internal Channel Correction</td>
<td>Enables/disables the baseband in-band correction. This is not available in MG3740A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>I/Q Calibration</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Wideband</td>
<td>Selects the switching mode for RF output bandwidth. This is not available in MG3740A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off  On</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>F1</td>
<td>Analog I/Q Input Adjustments</td>
<td>Displays the Analog I/Q Input function menu to adjust and set the analog I/Q input. This is available in MG3710A only when option-018/118 is installed. This is not available in MG3740A. Refer to 7.6.2 “Analog I/Q Input Adjustments”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Analog I/Q Output Adjustments</td>
<td>Displays the Analog I/Q Output function menu to adjust and set the analog I/Q output. This is available in MG3710A only when option-018/118 is installed. This is not available in MG3740A. Refer to 7.6.3 “Analog I/Q Output Adjustments”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Internal Baseband Adjustments</td>
<td>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”.</td>
</tr>
</tbody>
</table>

Table 7.6-1  IQ Function Menu
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. 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**

\[ [:\text{SOUR}ce[1]|2]:\text{DM}:\text{SOUR}ce \text{ INTernal|AEXTernal} \]

**Query**

\[ [:\text{SOUR}ce[1]|2]:\text{DM}:\text{SOUR}ce? \]

**Response**

<mode> INT or AEXT

**Parameter**

<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.

![Analog I/Q Input Connector](image1.png)

**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.

![I/Q Signal Input Level](image2.png)

**Figure 7.6-2  I/Q Signal Input Level**
Example: To execute the vector modulation with the external I/Q signal.

1. 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](image)

2. Press of RF Output to set the RF output to On. Press 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](image)

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

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.

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: RF terminal (Default)
- Analog I/Q Out: 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>: Baseband signal output destination
- RFOOut: RF terminal (Default)
- AEXTernal: Analog I/Q Out
### Programming Example

To set the output destination for baseband signals to Analog I/Q Out terminal.

```plaintext
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 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 the **ON** button 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](image-url)
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Baseband in-band correction: Internal Channel Correction

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.

**Remote command**

**Enable/disable the baseband in-band correction**

**Command**

```
```

**Query**

```
[:SOURce[1]|2]:DM:INTernal:CHANnel:CORRection[:STATe]?
```

**Response**

```
<boolean> 0 or 1
```

**Parameter**

```
<boolean>  

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 ON
DM: INT:CHAN:CORR?
> 1
```
Baseband in-band correction: Wideband

Selects the switching mode for RF output bandwidth.

This cannot be used in MG3740A.

Press **F6 Wideband** on the I/Q function menu to select the mode.

- **Off**  
  Harmonics distortion characteristic has priority (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 output, this function has no effect.

### Remote command

**Enable/disable the wideband output**

**Command**

```
[ :SOURce[1]|2]:DM:WIDeband <boolean>
```

**Query**

```
[ :SOURce[1]|2]:DM:WIDeband?
```

**Response**

`<boolean>` 0 or 1

**Parameter**

`<boolean>`  

- **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

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.

![I/Q Calibration](image)

Table 7.6.1-1 I/Q Calibration Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Execute</td>
<td>Executes the calibration for the I/Q gain balance, origin offset, and I/Q quadrature angle.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Cal Type</td>
<td>Sets the calibration method for the I/Q calibration execution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DC Full</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Restore Default</td>
<td>Returns the calibration value to factory setting status.</td>
</tr>
</tbody>
</table>

Execute Cal

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
```
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Remote command

Execute the calibration for the I/Q quadrature modulator with the range of all frequencies

Command
:CALibration[1]|2:IQ:FULL

Programming Example
To execute the calibration of SG1 for the range of all frequencies.
CAL:IQ:FULL

Cal Type

Selects the calibration method for the I/Q calibration execution.

Press F2 Cal Type on the I/Q Calibration function menu to select the method.

- 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 method for the I/Q calibration execution

Command

Query

Response
<type>

Parameter
<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.
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Programming Example
To set the calibration method for the SG1 I/Q calibration execution to the range of all frequencies.
CAL:IQ:TYPE FULL
CAL:IQ:TYPE?
> FULL

Remote command  Query the calibration method for the calibration execution
Query

Response
<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 calibration method for the SG1 calibration execution.
CAL:IQ:INF:TYPE?
> FULL

Remote command  Query the latest date when the calibration has been executed
Query
:CALibration[1]|2:IQ:INFomation:DATE?

Response
<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:DATE?
> 2011/01/01
### Remote command

**Query the latest time when the calibration has been executed**

**Query**
```
```

**Response**
<time> hh:mm:ss
Default 00:00:00

**Programming Example**
To query the time when the calibration for SG1 has been executed.
CAL:IQ:INF:TIME?
> 01:01:01

### Restore Default

![I/Q, I/Q Calibration](image)

Press F8 Restore Default on the I/Q Calibration function menu to execute the function.

This function cannot be executed during Sweep/List execution.

**Remote command**

**Return the calibration value to factory setting status**

**Command**
```
```

**Programming Example**
To return the SG1 calibration value to factory setting status.
CAL:IQ:DEF
7.6.2 Analog I/Q Input Adjustments

Adjusts/sets the analog I/Q input. This is available in MG3710A 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.

| Table 7.6.2-1 Analog I/Q Input Adjust Function Menu |
|---|---|---|
| Page | Key No. | Menu Display | Function |
| 1 | F1 | I Offset 0.000 V | Sets the offset for the I-phase. |
| 1 | F2 | Q Offset 0.000 V | Sets the offset for the Q-phase. |

I Offset

Sets the offset for the I-phase.

This is available in MG3710A 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 mV to 100 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>`  
  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.
  
  1. `DM:IQAD:EXT:IOFF 50MV`
  2. `DM:IQAD:EXT:IOFF?`

  > 0.050

### Q Offset

- 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 mV to 100 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>`: 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

Adjusts/sets the analog I/Q output.

This is available in MG3710A 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>I Level Trimming 100.0%</td>
<td>Adjusts the I-phase output level gain.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Q Level Trimming 100.0%</td>
<td>Adjusts the Q-phase output level gain.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>I/Q Common Offset 0.0000 V</td>
<td>Adjusts the I/Q inphase output DC offset level.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>I Diff Offset 0.0000 V</td>
<td>Adjusts the I-phase differential output DC offset level.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Q Diff Offset 0.0000 V</td>
<td>Adjusts the Q-phase differential output DC offset level.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Setting range of output voltage</th>
<th>0.0 to 120.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum setting resolution</td>
<td>0.1%</td>
</tr>
<tr>
<td>Setting range of inphase DC offset</td>
<td>–2.500 to 5.000 V</td>
</tr>
<tr>
<td>Minimum setting resolution</td>
<td>2 mV</td>
</tr>
<tr>
<td>Setting range of differential DC offset</td>
<td>–50.00 to 50.00 mV</td>
</tr>
<tr>
<td>Minimum setting resolution</td>
<td>0.1 mV</td>
</tr>
</tbody>
</table>

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 I 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.
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I Level Trimming

Adjusts the I-phase output level gain.

This is available in MG3710A 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

[:SOURce[1]]:DM:IQADjustment:EXTernal:ITRimming <percent>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:ITRimming?

Response

<percent> Unit: PCT

Parameter

<percent> I-phase output level gain
- Range: 0% to 120%
- Resolution: 0.1%
- Default: 100%
- Suffix code: 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

Adjusts the Q-phase output level gain.

This is available in MG3710A 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**

`[:SOURce[1]]:DM:IQADjustment:EXTernal:QTRimming <percent>`

**Query**

`[:SOURce[1]]:DM:IQADjustment:EXTernal:QTRimming?`

**Response**

`<percent>` Unit: PCT

**Parameter**

`<percent>` Q-phase output level gain
Range 0% to 120%
Resolution 0.1%
Default 100%
Suffix code 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

Adjusts the I/Q inphase output DC offset level.

This is available in MG3710A 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 V to 5 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> 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

Adjusts the I-phase differential output DC offset level.

This is available in MG3710A only when option-018/118 is installed. This is not available in MG3740A.

Press F4 I Diff Offset on the Analog I/Q Output Adjust function menu to set with the I Diff Offset dialog box.

Remote command

Adjust the I-phase differential output DC offset level

Command

[:SOURce[1]]:DM:IQADjustment:EXTernal:DIOFfset <voltage>

Query

[:SOURce[1]]:DM:IQADjustment:EXTernal:DIOFfset?

Response

<voltage> Unit: V

Parameter

<voltage> I-phase differential output DC offset level

Range –50 mV to 50 mV
Resolution 0.1 mV
Default 0 V

Suffix code V, MV, UV, When omitted: V

Programming Example

To adjust the I-phase differential output DC offset level to 5 mV.

DM:IQAD:EXT:DIOF 5MV
DM:IQAD:EXT:DIOF?
> 0.0050
Q Diff Offset

Adjusts the Q-phase differential output DC offset level.

This is available in MG3710A only when option-018/118 is installed. This is not available in MG3740A.

Press F5 Q Diff Offset on the Analog I/Q Output Adjust function menu to set with the Q Diff Offset dialog box.

Range: -50 mV to 50 mV
Resolution: 0.1 mV
Default: 0 V

Remote command

Adjust the Q-phase differential output DC offset level

Command
[:SOURce[1]]:DM:IQADjustment:EXTernal:DQOFfset <voltage>

Query
[:SOURce[1]]:DM:IQADjustment:EXTernal:DQOFfset?

Response
<voltage> Unit: V

Parameter
<voltage> Q-phase differential output DC offset level
Range: -50 mV to 50 mV
Resolution: 0.1 mV
Default: 0 V
Suffix code: V, MV, UV, When omitted: V

Programming Example
To adjust the Q-phase differential output DC offset level to 5 mV.
DM:IQAD:EXT:DQOF 5MV
DM:IQAD:EXT:DQOF?
> 0.0050
7.6.4 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>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>I Offset 0.000 %</td>
<td>Sets the DC offset for the I-phase.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Q Offset 0.000 %</td>
<td>Sets the DC offset for the Q-phase.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Gain Balance 0.000 dB</td>
<td>Adjusts the I/Q phase gain balance.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Quad. Angle 0.00 deg</td>
<td>Adjusts the quadrature angle of I/Q phase.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>I/Q Phase 0.00 deg</td>
<td>Adjusts the Baseband signal phases.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>I/Q Skew 0.000000000000 s</td>
<td>Adjusts the I/Q phase time difference (timing).</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>I/Q Delay 0.000000000000 s</td>
<td>Adjusts the Baseband signal output timing.</td>
</tr>
</tbody>
</table>

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 the I-phase
Command
[:SOURce[1]|2]:DM:IQADjustment:IOFFset <percent>
Query
[:SOURce[1]|2]:DM:IQADjustment:IOFFset?
Response
<percent> PCT
Parameter
<percent> DC offset value
Range –20% to 20%
Resolution 0.025%
Default 0%
Suffix code PCT (%), When omitted: PCT
Programming Example
To adjust the I-phase DC offset to 10%.
DM:IQAD:IOFF 10
DM:IQAD:IOFF?
> 10.000
Q Offset

Press F2 Q Offset on the Internal Baseband Adjust function menu to set with the Q Offset dialog box.

Range –20% to 20%
Resolution 0.025%
Default 0%

Remote command

**Set the DC offset for the Q-phase**

**Command**

`[:SOURce[1]|2]:DM:IQAjustment:QOFFset <percent>`

**Query**

`[:SOURce[1]|2]:DM:IQAjustment:QOFFset?`

**Response**

`<percent>` Unit: PCT

**Parameter**

`<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:IQA:QOFF 10
DM:IQA:QOFF?
> 10.000
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
7.6 I/Q Modulation

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

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](image)

Remote command
Adjust the I/Q phase quadrature angle

Command
[:SOURce[1]|2]:DM:IQADjustment:QSKew <angle>

Query
[:SOURce[1]|2]:DM:IQADjustment:QSKew?

Response
<angle> Unit: deg
Chapter 7  Modulation

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;angle&gt;</td>
<td>Quadrature angle of the I/Q phase</td>
</tr>
<tr>
<td>Range</td>
<td>–10 deg to 10 deg</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 deg</td>
</tr>
<tr>
<td>Default</td>
<td>0 deg</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DEG, When omitted: DEG</td>
</tr>
</tbody>
</table>

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 Phase

Adjust the Baseband signal phase.

This is used to adjust multiple SGs signal phases with MIMO or beam forming. The setting is same as F7 I/Q Phase in Table 7.3.15-1 “Sync Multi SG Function Menu”.

Press F5 I/Q Phase on the Internal Baseband Adjust function menu to set with the I/Q Phase dialog box.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–360 deg to 360 deg</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 deg</td>
</tr>
<tr>
<td>Default</td>
<td>0 deg</td>
</tr>
<tr>
<td>When the positive</td>
<td>value is set, the phase is adjusted to be</td>
</tr>
<tr>
<td>adjusted</td>
<td>promoted</td>
</tr>
</tbody>
</table>

Remote command

Adjust the Baseband signal phase

Command

[:SOURce[1]|2]:DM:IQADjustment:PHASe <phase>

Query

[:SOURce[1]|2]:DM:IQADjustment:PHASe?

Response

<phase>  Unit: deg

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;phase&gt;</td>
<td>Baseband signal phase</td>
</tr>
<tr>
<td>Range</td>
<td>–360 deg to 360 deg</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 deg</td>
</tr>
<tr>
<td>Default</td>
<td>0 deg</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DEG, When omitted: DEG</td>
</tr>
</tbody>
</table>
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

I/Q time difference: I/Q Skew

Remote command
Adjust the time difference (timing) between I-phase and Q-phase
Command
[:SOURce[1]|2]:DM: IQADjustment:SKEW <time>
Query
[:SOURce[1]|2]:DM: IQADjustment:SKEW?
Response
<time> Unit: S
Parameter
<time> Time difference between the I-phase and Q-phase
Range
Resolution
Default
Suffix code
When omitted: S
Programming Example
To set the time difference between I-phase and Q-phase to 500 ps.
DM: IQAD: SKEW 500PS
DM: IQAD: SKEW?
> 0.000000000500
Chapter 7  Modulation

I/Q Delay

I/Q Delay

Adjusts the Baseband signal output timing.

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 F8 I/Q Delay in Table 7.3.15-1 “Sync Multi SG Function Menu”.

Press F7 I/Q Delay on the Internal Baseband Adjust function menu to set with the I/Q Delay dialog box.

Range    -400 ns to 400 ns
Resolution 1 ps
Default    0 s

Remote command

Adjust the Baseband signal output timing

Command

{:SOURce[1]|2}:DM:AD:DELay <time>

Query

{:SOURce[1]|2}:DM:AD:DELay?

Response

<time>       Unit: S

Parameter

<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 Example

To set the time difference between I-phase and Q-phase to 300 ns.

DM:AD:DEL 300NS
DM:AD:DEL?
> 0.000000300000
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.

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8.1.2 External connection ..............................  8-5
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8.1 Function, Performance, and Communication

When the MG3710A/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/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/MG3740A is in the BER measurement mode, unless otherwise specified.

8.1.1 Function and performance

The BER measurement function of the MG3710A/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**
  - \( \leq 4294967295 \) bits = \( 2^{32} - 1 \) bit
- **Number of measurable error bits**
  - \( \leq 4294967295 \) bits = \( 2^{32} - 1 \) 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
  - Auto Resync: On, Off
8.1 Function, Performance, and Communication

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 × 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 synchronization
For PN signals on the MG3710A/MG3740A, the synchronization establishing condition is (PN order × 2) bit continuous error free. For PN signals including random errors, probabilities of a section in which (PN order × 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.

<table>
<thead>
<tr>
<th>PN order</th>
<th>PN9</th>
<th>PN15</th>
<th>PN23</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>15.0</td>
<td>4.2</td>
<td>0.79</td>
</tr>
<tr>
<td>3</td>
<td>57.8</td>
<td>40.1</td>
<td>24.6</td>
</tr>
<tr>
<td>1</td>
<td>83.5</td>
<td>74.0</td>
<td>63.0</td>
</tr>
<tr>
<td>0.1</td>
<td>98.2</td>
<td>97.0</td>
<td>95.5</td>
</tr>
</tbody>
</table>

Detection of SyncLoss
When the Auto Resync setting is ON, the SyncLoss detection conditions are as follows:

x/y:
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”.

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

Press Aux Fnct on the main function menu or F5 Auxiliary, >BER 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.

![BER Dialog Box](image)

When BER is not measured, Error Rate 0, Error Count 0, and Data Count 0 are displayed in the BER dialog box.

<table>
<thead>
<tr>
<th>No.</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Status</td>
<td>Indicates the status of measurement.</td>
</tr>
<tr>
<td>2</td>
<td>Error</td>
<td>Explains an error when it occurs.</td>
</tr>
<tr>
<td>3</td>
<td>Sync Loss Count</td>
<td>Indicates a SyncLoss count and a reason why it stopped.</td>
</tr>
<tr>
<td>4</td>
<td>Error Rate</td>
<td>Indicates an error rate in index and percentage.</td>
</tr>
<tr>
<td>5</td>
<td>Error Count</td>
<td>Indicates the number of error bits.</td>
</tr>
<tr>
<td>6</td>
<td>Data Count</td>
<td>Indicates the number of measurement bits.</td>
</tr>
</tbody>
</table>
8.2 Display Description

Status

Indicates the status of the BER measurement.

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop</td>
<td>Measurement stopped.</td>
</tr>
<tr>
<td>Synchronizing</td>
<td>Synchronization is being established.</td>
</tr>
<tr>
<td>Measuring</td>
<td>Measurement is in progress.</td>
</tr>
<tr>
<td>OverflowDataCount</td>
<td>Measurement stopped because the number of measurement bits exceeded the maximum value ($2^{32} - 1$ bit).</td>
</tr>
<tr>
<td>OverflowSyncLoss</td>
<td>Measurement stopped because the SyncLoss count exceeded the maximum value (65535).</td>
</tr>
</tbody>
</table>

Remote command

Query the status of the BER measurement

Query

[:SENSe]:BERT[:BASeband]:MEASure?

Response

<status>

Parameter

<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
Indicates the error information of the BER measurement.

### Table 8.2.1-3  Explanation of Errors

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit Error</td>
<td>An error bit occurred.</td>
</tr>
<tr>
<td>SyncLoss</td>
<td>SyncLoss occurred.</td>
</tr>
<tr>
<td>ClockError</td>
<td>The input clock signal was abnormal.</td>
</tr>
<tr>
<td>EnableError</td>
<td>The input enable signal was abnormal.</td>
</tr>
</tbody>
</table>

### Remote command

**Query the error information of the BER measurement**

**Query**

`[:SENSe]:BERT[:BASEband]:ERROR?`

**Response**

`<status>`

**Parameter**

`<status>`

**Value**

\[
\text{Value} = \text{bit}0 + \text{bit}1 + \text{bit}2 + \text{bit}3 + \text{bit}4 + \text{bit}5 + \text{bit}6 \\
+ \text{bit}7 + \text{bit}8 + \text{bit}9 + \text{bit}10 + \text{bit}11 + \text{bit}12 \\
+ \text{bit}13 + \text{bit}14 + \text{bit}15
\]

When a target application is BER, bits are assigned as follows:

- `bit0 : 2^0 = 1`  
  Sync Loss occurred
- `bit1 : 2^1 = 2`  
  Clock Error occurred
- `bit2 : 2^2 = 4`  
  Enable Error occurred
- `bit3 : 2^3 = 8`  
  (Not Used)
- `bit4 : 2^4 = 16`  
  (Not Used)
- `bit5 : 2^5 = 32`  
  (Not Used)
- `bit6 : 2^6 = 64`  
  (Not Used)
- `bit7 : 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 if both SG and BER operate normally.

Programming Example
To query the current operation status.
BERT:ERR?
> 0

SyncLoss Count
Displays a Sync Loss count of the BER measurement.

Remote command
Query a Sync Loss count of the BER measurement
Query
[:SENSe]:BERT[:BASeband]:SYNLoss:COUNt?

Response
<count>

Parameter
<count> Sync Loss count
Range 0 to 65535

Programming Example
To query a Sync Loss count.
BERT:SYNL:COUN?
> 500

Error Rate
Displays a bit error rate of the BER measurement function.
Error Rate is represented in two ways: in index; and in percentage. Each representation follows the rules:

In index
The rate is rounded to the digit of a ten-thousandth of the maximum digit and represented before the digit of a ten-thousandth.

Example: 0.00978495 is displayed as 9.785E-03.

In percentage
The rate is represented in percentage, rounded to four decimal places, and represented before four decimal places.

Example: 0.00978495 is displayed as 0.978%.
Remote command  | Query the bit error rate of the BER measurement function
---|---
Query  |

Response  |
<rate>

Parameter  |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EP</td>
<td>Returns the bit error rate in percentage.</td>
</tr>
<tr>
<td>ER</td>
<td>Returns the bit error rate as an index.</td>
</tr>
<tr>
<td>&lt;rate&gt;</td>
<td>Value of the bit error rate</td>
</tr>
<tr>
<td>EP</td>
<td>0.000 to 100.000 %</td>
</tr>
<tr>
<td>ER</td>
<td>0.000E+00 to 1.000E + 02</td>
</tr>
</tbody>
</table>

Programming Example  |
To query the bit error rate of the BER measurement function in percentage.
> 5.000

Error Count  |
Displays the number 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>

Parameter  |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;bit&gt;</td>
<td>Number of error bits</td>
</tr>
<tr>
<td>Range</td>
<td>0 to (2^{32}-1) bit</td>
</tr>
</tbody>
</table>

Programming Example  |
To query the number of error bits.
:FETC:BERT:ERR:COUN?
> 500
8.2 Display Description

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> Number of measurement bits
Range 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

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

Press Aux Fnc 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.

Table 8.3-1 BER Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Start BER Test</td>
<td>Starts the BER measurement. Refer to 8.3.1 “Starting/stopping BER measurement”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Stop BER Test</td>
<td>Stops the BER measurement. Refer to 8.3.1 “Starting/stopping BER measurement”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Clear BER Count</td>
<td>Clears Data Count, ErrorCount, or SyncLossCount. Refer to 8.3.1 “Starting/stopping BER measurement”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Measure Mode</td>
<td>Selects a mode for the BER measurement from Single, Continuous, or Endless. Refer to 8.3.2 “Measure Mode”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continuous</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Count Mode</td>
<td>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”.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Data Type</td>
<td>Selects data pattern for measurement. Refer to 8.3.4 “Data Type”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PN9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>PN Fix Pattern</td>
<td>Sets the PN Fix pattern. Refer to 8.4 “PN Fix Pattern”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>User Pattern</td>
<td>Queries or sets user defined patterns. Refer to 8.5 “User Defined Pattern”.</td>
</tr>
</tbody>
</table>
### Table 8.3-1  BER Function Menu (Cont’d)

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>F1</td>
<td>Resync Condition</td>
<td>Sets the automatic resynchronization function.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 8.3.5 “Resync Condition”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>BER Interface</td>
<td>Sets the interface for the BER measurement.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 8.3.6 “BER Interface”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Show Log</td>
<td>Displays, saves, or deletes a log of the BER measurement result.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 8.6 “BER Log”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Auto Restart</td>
<td>Sets whether to auto-restart BER measurement when output level is changed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td>Refer to 8.3.1 “Starting/stopping BER measurement”.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Level</td>
<td>Sets the output level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>–144.00 dBm</td>
<td>Refer to 5.2 “Output Level Setting Method: Level”.</td>
</tr>
</tbody>
</table>
8.3.1 Starting/stopping BER measurement

Start BER Test

Starts the BER measurement. Press F1 Start BER Test to start the BER measurement. If this is pressed during measurement, measurement values obtained during measurement are cleared and nothing remains in the log. Measurement starts over after stopping.

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. 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)

<table>
<thead>
<tr>
<th>Auto Resync Count Mode</th>
<th>On</th>
<th>Off</th>
</tr>
</thead>
</table>
| 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 ($2^{32} - 1$ bit).  
                          | • Reaches the maximum SyncLoss count (65535).  | • Reaches the specified number of the measurement error bits.  
                          | • Reaches the maximum number of measurement bits ($2^{32} - 1$ 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/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

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
Command
[: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 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.
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

or Top>–Auxiliary, >BER>–Auto Restart
Enables/disables the Auto Restart.
Press 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>  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  Performing BER Measurement

8.3.2  Measure Mode

or Top> Auxiliary, >BER> Measure Mode

Selects a mode for the BER measurement.

Press F4 Measure Mode 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

Query

[:SENSe]:BERT[:BASeband]:MODE?

Response

<mode> SING, CONT, or ENDL

Parameter

<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

To set the measurement mode to Continuous.

BERT:MODE CONT
BERT:MODE?
> CONT
Chapter 8  BER Measurement

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](image)

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.

![Figure 8.3.2-2 Measure Mode: Single or Endless](image)
8.3 Performing BER Measurement

8.3.3 Measurement end conditions: 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Count Mode</td>
<td>Selects a measurement end condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data Error</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Data 1000</td>
<td>Sets the number of measurement bits.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Error 1</td>
<td>Sets the number of measurement error bits.</td>
</tr>
</tbody>
</table>

Selecting measurement end conditions: Count Mode

Sets 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.
```
Chapter 8  BER Measurement

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

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  Setting Range**

<table>
<thead>
<tr>
<th>Setting range</th>
<th>1000 bit to $2^{32} – 1$ (4294967295) bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>1000 bit</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Setting range</th>
<th>1 bit to $2^{32} - 1$ (4294967295) bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>1 bit</td>
</tr>
</tbody>
</table>

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

Select a data type.

Press **F6 Data Type** to display the Data type function menu to select a data pattern for the measurement. Use **→** to display page 2.

**Options**
- PN9, PN11, PN15, PN20, PN23,
- PN9Fix, PN11Fix, PN15Fix, PN20Fix, PN23Fix,
- ALL0 (all 0s), ALL1 (all 1s), Alternate (0, 1, 0, 1),
- User Defined (user defined patterns)

**Note:**
- The PN_Fix pattern is a pattern consisting of repeated parts of PN patterns and PN patterns with length shorter than 1 cycle.
- Refer to 8.4 “PN Fix Pattern” and 8.5 “User Defined Pattern” for details of PN_Fix and UserDefined.

#### Remote command

**Select a data type**

**Command**

```
[:SENSe]:BERT[:BASeband]:PRBS[:DATA]
```

**Query**

```
[:SENSe]:BERT[:BASeband]:PRBS[:DATA]?
```

**Response**

```
<pattern>
```

**Parameter**

<table>
<thead>
<tr>
<th>&lt;pattern&gt;</th>
<th>Type of data patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN9</td>
<td>PN9 (Default)</td>
</tr>
<tr>
<td>PN11</td>
<td>PN11</td>
</tr>
<tr>
<td>PN15</td>
<td>PN15</td>
</tr>
<tr>
<td>PN20</td>
<td>PN20</td>
</tr>
<tr>
<td>PN23</td>
<td>PN23</td>
</tr>
<tr>
<td>FPN9</td>
<td>PN9Fix</td>
</tr>
<tr>
<td>FPN11</td>
<td>PN11Fix</td>
</tr>
<tr>
<td>FPN15</td>
<td>PN15Fix</td>
</tr>
<tr>
<td>FPN20</td>
<td>PN20Fix</td>
</tr>
<tr>
<td>FPN23</td>
<td>PN23Fix</td>
</tr>
<tr>
<td>ALL0</td>
<td>All 0s (00...0)</td>
</tr>
<tr>
<td>ALL1</td>
<td>All 1s (11...1)</td>
</tr>
<tr>
<td>ALT</td>
<td>Repetitions of 0, 1 (0, 1, 0, 1,...)</td>
</tr>
<tr>
<td>USER</td>
<td>User defined patterns</td>
</tr>
</tbody>
</table>


Programming Example

To set the data pattern for measurement to PN23.

BERT:PRBS PN23
BERT:PRBS?
> PN23
8.3.5 Resync Condition

Press \( \text{F1 Resync Condition} \) to display the Resync Condition function menu and set the automatic resynchronization function for the BER measurement.

Table 8.3.5-1  Resync Condition Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Auto Resync</td>
<td>Specifies whether or not to automatically perform</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td>resynchronization when a Sync Loss occurs.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Threshold X</td>
<td>Specifies the number of bits to determine if Sync</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
<td>Loss occurs (numerator).</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Threshold Y</td>
<td>Specifies the number of bits to determine if Sync</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500 bits</td>
<td>Loss occurs (denominator).</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>at SyncLoss</td>
<td>Specifies whether or not to clear the measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear Keep</td>
<td>results when a Sync Loss is detected.</td>
</tr>
</tbody>
</table>

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.
8.3 Performing BER Measurement

Measured error rates and the corresponding recommended settings are as follows:

Table 8.3.5-2 Measured Error Rates and Recommended Settings

<table>
<thead>
<tr>
<th>Measured error rate</th>
<th>Value</th>
<th>AutoResync On</th>
<th>AutoResync Off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AutoResync</td>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td></td>
<td>On</td>
<td>50/500</td>
<td>200/500</td>
</tr>
<tr>
<td>Less than 0.3%</td>
<td>Optimal setting</td>
<td>Measurable</td>
<td>Measurable</td>
</tr>
<tr>
<td>0.3% or more</td>
<td>√</td>
<td>Optimal setting</td>
<td>Measurable</td>
</tr>
</tbody>
</table>

√ 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 (WCDMA) BER function: 23/64

There are differences between Auto Resync on the MG3710A/MG3740A and Auto Sync on the MP1201C or MD6420A.

Details of Auto Resync on the MG3710A/MG3740A

Auto Resync on the MG3710A/MG3740A behaves as follows:

Auto Resync On
The MG3710A/MG3740A performs synchronization when it starts measurement. It starts measurement after the synchronization is established. After the measurement starts, the MG3710A/MG3740A automatically performs resynchronization when it detects SyncLoss.

![Figure 8.3.5-1 Auto Resync On](image)
Auto Resync Off
The MG3710A/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](image)

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](image)

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](image)
8.3 Performing BER Measurement

**Note:**
To get BER curve, set Auto Sync to On and establish synchronization in good S/N condition, and then change Auto Sync to Off and perform measurement with varying S/N.

Auto Resync

![Auto Resync](image)

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** &nbsp;&nbsp; Automatically performs resynchronization (Default).
- **Off** &nbsp;&nbsp; Does not automatically perform resynchronization.

**Remote command**

Enable/disable the automatic resynchronization

**Command**

```
[:SENSe]:BERT[:BASeband]:RSYNc[:STATe] <boolean>
```

**Query**

```
[:SENSe]:BERT[:BASeband]:RSYNc[:STATe]?
```

**Response**

```
<boolean> 0 or 1
```

**Parameter**

```
<boolean>
ON|1
OFF|0
```

- **ON|1** &nbsp;&nbsp; Set the automatic resynchronization
  Automatically performs resynchronization (Default).
- **OFF|0** &nbsp;&nbsp; Does not automatically perform resynchronization.

**Programming Example**

To set automatic resynchronization to On.

```
BERT:RSYN ON
BERT:RSYN?
> 1
```
Conditions for detecting Sync Loss: Threshold X, Threshold Y

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.

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

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> Numerator of the threshold
Based on Table 8.3.5-3 “Setting Range”.
Y Denominator of the threshold
500 500 bits (Default)
5000 5000 bits
50000 50000 bits

Table 8.3.5-3 Setting Range

<table>
<thead>
<tr>
<th>Setting range</th>
<th>1 bit to (Y/2) bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>200 bits</td>
</tr>
</tbody>
</table>
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

Operations when detecting Sync Loss: at SyncLoss

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

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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Clock Edge Fall</td>
<td>Specifies an enabled edge for Clock.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Data Polarity</td>
<td>Specifies a polarity of the Data connector.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negative Positive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Enable Active</td>
<td>Specifies a polarity of the Enable connector and whether or not to use it.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disable</td>
<td></td>
</tr>
</tbody>
</table>

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[:BASEband]:CLOCk:POLarity POSitive|NEGative

Query
:INPut:BERT[:BASEband]:CLOCk:POLarity?

Response
<mode> POS or NEG
8.3 Performing BER Measurement

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSitive</td>
<td>Detects Data at the rising edge of Clock signals (Default).</td>
</tr>
<tr>
<td>NEGative</td>
<td>Detects Data at the falling edge of Clock signals.</td>
</tr>
</tbody>
</table>

Programming Example

To specify to detect Data at the rising edge of Clock signals.

INP:BERT:CLOC:POL POS
INP:BERT:CLOC:POL?
> POS

Data Polarity

or Top> Auxiliary, >BER> Resync Condition > BER Interface > Data Polarity

Sets the logic for Data signals.

Press **F2 Data Polarity** 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

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSitive</td>
<td>Positive logic (Default)</td>
</tr>
<tr>
<td>NEGative</td>
<td>Negative logic</td>
</tr>
</tbody>
</table>

Programming Example

To set the polarity for Data signals to positive logic.

INP:BERT:DATA:POL POS
INP:BERT:DATA:POL?
> POS
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 Enable Active function menu.

- **Disable**: Does not use Enable signals (Default).
- **High**: Measures the signals when High input.
- **Low**: Measures the signals when Low input.

Remote command

**Set the logic for Enable signals of the BER measurement**

**Command**

:INPut:BERT[:BASeband]:CGATe:POLarity

**Query**

:INPut:BERT[:BASeband]:CGATe:POLarity?

**Response**

`<mode>` POS, NEG, or DIS

**Parameter**

- **DISABLE**: Does not use Enable signals (Default).
- **POSitive**: Measures the signals when High input.
- **NEGative**: Measures the signals when Low input.

**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.

\[ \text{PN}_x \times N \ (N = 0, 1, 2, ...) \]

<table>
<thead>
<tr>
<th>PNx ((2^x - 1 \text{ bit}))</th>
<th>PNx ((2^x - 1 \text{ bit}))</th>
<th>(\ldots)</th>
<th>PNx not completed ((y \text{ bit}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNx ((2^x - 1 \text{ bit}))</td>
<td>PNx ((2^x - 1 \text{ bit}))</td>
<td>(\ldots)</td>
<td>PNx not completed ((y \text{ bit}))</td>
</tr>
</tbody>
</table>

PN_Fix pattern length
\[ = (2^x - 1) \times N + y \text{ bit} \]

x: PN order
N: Repetition count of PNx

Figure 8.4-1 PN_Fix Pattern
8.4.1 Setting PN_Fix Pattern: 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Initial</td>
<td>Specifies an initial value of PN Pattern for PN Fix.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1FF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Length</td>
<td>Specifies a length of 1 cycle in bit unit for PN Fix.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>96 Bits</td>
<td></td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>Data Type</th>
<th>Initial Pattern Setting Range</th>
<th>Resolution</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN9Fix</td>
<td>000000000 to 1111111111 (9 bits)</td>
<td>000 to 1FF</td>
<td>1FF</td>
</tr>
<tr>
<td>PN11Fix</td>
<td>00000000000 to 111111111111 (11 bits)</td>
<td>0000 to 7FF</td>
<td>7FF</td>
</tr>
<tr>
<td>PN15Fix</td>
<td>00000000000000000000 to 11111111111111111111 (15 bits)</td>
<td>000000 to 7FFFF</td>
<td>7FFFF</td>
</tr>
<tr>
<td>PN20Fix</td>
<td>00000000000000000000000 to 1111111111111111111111111111 (20 bits)</td>
<td>00000000 to 7FFFFFF</td>
<td>7FFFFFF</td>
</tr>
<tr>
<td>PN23Fix</td>
<td>00000000000000000000000000000000 to 11111111111111111111111111111111 (23 bits)</td>
<td>000000000000 to 7FFFFFFF</td>
<td>7FFFFFFF</td>
</tr>
</tbody>
</table>

<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
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

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>
<thead>
<tr>
<th>Setting range</th>
<th>96 bits to 134217728 bits (0x8000000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>96 bit</td>
</tr>
</tbody>
</table>
Remote command | Set a length of PN_Fix patterns

**Command**

```plaintext
[:SENSe]:BERT[:BASEband]:PRBS:PNF:LENGth <ext_integer>
```

**Query**

```plaintext
[:SENSe]:BERT[:BASEband]:PRBS:PNF:LENGth?
```

**Response**

```plaintext
<ext_integer>
```

**Parameter**

```plaintext
<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.

```plaintext
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:
Chapter 8  BER Measurement

1. Detect 18 bit error free (PN9 synchronization establishing condition)

2. Detect discontinuity

3. Detect 9 bit error free

PN9 not completed (200 bit)

PN9 (511 bit)  PN9 (511 bit)  PN9 not completed (200 bit)

PN9Fix sync. established

Discontinuity

PN9 not completed

PN9 (511 bit)

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 PN9 signals of the communication channel.

However, on a signal generator using a waveform generator like the MG3710A/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](image)

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 IQproducer™ shown in Figure 8.4.3-2, and select PN Fix pattern for Data Type.

Refer to an operation manual of each IQproducer™ for how to set PN_Fix signals on IQproducer™.

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.

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/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.

<table>
<thead>
<tr>
<th>Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 1</td>
<td>Single-byte number</td>
</tr>
<tr>
<td>Space</td>
<td>Single-byte space</td>
</tr>
<tr>
<td>New line</td>
<td>CR/LF</td>
</tr>
<tr>
<td>#</td>
<td>Single-byte #</td>
</tr>
</tbody>
</table>

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 User Defined Pattern

8.5.1 Displaying user defined patterns

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.

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).

3. Sync Position Start
   Indicates a bit at which synchronizing User Patterns starts. Refer to 8.5.2 “Setting user defined patterns: User Pattern”.

4. 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”.

5. 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>

Details

If there is no user defined pattern file, the command returns ***.

Parameter

<pattern>
User defined pattern file name
Character string within 100 characters, excluding an extension (bpn)

<drive>
Drive name where the user defined pattern file is loaded

Programming Example

To query a user defined pattern name.
BERT:PRBS:USER:PATT?
> TEST1,D
Response when a corresponding pattern does not exist:
> ***

Pattern Length

Displays a pattern length of a user defined pattern for the BER measurement.

Remote command

Query a pattern length of a user defined pattern for the BER measurement

Query

[:SENSe]:BERT[:BASEband]:PRBS:USER:LENGth?

Response

<integer>

Parameter

<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>

Parameter
<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 "0s" 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

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.

<table>
<thead>
<tr>
<th>Table 8.5.2-1  User Pattern Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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.

![Figure 8.5.2-1 Specifying the Location to Determine if Synchronization Is Established](image)
8.5 User Defined Pattern

Setting the start bit: 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>
<thead>
<tr>
<th>Setting range</th>
<th>1 bit to (Pattern Length) bit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>1 bit</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Setting range</th>
<th>8 bits to 1024 bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>1 bit</td>
</tr>
<tr>
<td>Default</td>
<td>32 bit</td>
</tr>
</tbody>
</table>

### Remote command

**Set a length to determine if synchronization is established**

**Command**

```
[:SENSe]:BERT[:BASEband]:PRBS:USER:SYNC:LENGth <ext_integer>
```

**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 User Defined Pattern

8.5.3 Loading user defined patterns: Open

Loads user defined patterns 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 pattern

Command:
:MMEMory:LOAD:BERT:PATTern <string>[,<device>]

Parameter:
<string> File name excluding extension
Character string within 100 characters enclosed by double quotes (“”) or single quotes (‘’)
(excluding extension)
<device> Number of the drive
Options A to Z, currently selected drive when omitted

Details
Only a file with the extension “.bpn” can be loaded.
If a corresponding user defined pattern file does not exist, the command returns an error.

Programming Example
To load the user defined pattern file “USERPATTERN.bpn” from D drive.
:MMEM:LOAD:BERT:PATT “USERPATTERN”,D

Remote command: Load a list of user defined pattern files

Query:

Response:
<s1>,<s2>,<s3>.........,<s999>,<s1000>

Parameter:
<device> Number of the drive
Options A to Z, currently selected drive when omitted
<s1>,.........,<s1000> 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
Load a user defined pattern.

1. 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.

| Table 8.5.3-1  User Pattern Open Function Menu |
|-------------|-----------------|-----------------|---------------|
| 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. |

2. Press F1 Device to select a device containing the user defined pattern files to load.

3. Select user defined pattern files to load from File List and press F7 Open.

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

Displays the past results of the BER measurement and saves them as files.

Press 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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Date</td>
<td>Indicates the time when the measurement ended.</td>
</tr>
<tr>
<td>2</td>
<td>Status</td>
<td>Indicates the reason why the measurement ended.</td>
</tr>
<tr>
<td>3</td>
<td>Mode</td>
<td>Indicates the mode when the measurement was performed (Continuous, Single, or Endless).</td>
</tr>
<tr>
<td>4</td>
<td>Error Rate</td>
<td>Indicates an error rate in index.</td>
</tr>
<tr>
<td>5</td>
<td>Error Count</td>
<td>Indicates the number of error bits.</td>
</tr>
<tr>
<td>6</td>
<td>Bit Count</td>
<td>Indicates the number of measurement bits.</td>
</tr>
<tr>
<td>7</td>
<td>Sync Loss</td>
<td>Indicates a SyncLoss count (only for Auto Resync On).</td>
</tr>
</tbody>
</table>

Figure 8.6-1 BER Test Log

Table 8.6-1 Display Items of BER Test Log
Table 8.6-2  End Reasons

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>Indicates that the specified bits or error bits were exceeded and the test completed successfully.</td>
</tr>
<tr>
<td>STOP</td>
<td>Indicates that you pressed F2 Stop BER Test to stop the measurement or specified parameters and the measurement stopped.</td>
</tr>
<tr>
<td>OVERFLOW_</td>
<td>Indicates that the measurement bits exceeded the maximum value and the measurement stopped.</td>
</tr>
<tr>
<td>DATACOUNT</td>
<td></td>
</tr>
<tr>
<td>OVERFLOW_</td>
<td>Indicates that the SyncLoss count exceeded the maximum value and the measurement stopped.</td>
</tr>
<tr>
<td>SYNCLOSS</td>
<td></td>
</tr>
<tr>
<td>ABNORMAL_</td>
<td>Indicates that a malfunction of the BER measurement circuit resulted in the measurement stop.</td>
</tr>
<tr>
<td>COUNT</td>
<td></td>
</tr>
<tr>
<td>CLEAR</td>
<td>Indicates that you pressed F3 Clear BER Count to clear the measurement value. This does not mean the measurement stopped.</td>
</tr>
</tbody>
</table>

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>  Log No.
Range          1 to log count
<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 query log #11 of the BER measurement.

BERT:LOG? 11
> 2011/09/01 10:35:42,OK,Continuous,1.800E-002,18,1000,0
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>  
Count of logs for the measurement results

Range  
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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Clear</td>
<td>Deletes logs stored in the memory. Turning the power of the MG3710A/MG3740A off also deletes logs. Refer to 8.6.1 “Deleting BER logs: Clear”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Save</td>
<td>Saves BER Test Log as a file in the text format. Refer to 8.6.2 “Saving BER logs: Save”.</td>
</tr>
</tbody>
</table>
8.6.1 Deleting BER logs: Clear

Deletes logs of the BER measurement.
Press F1 Clear on the BER Log function menu to delete logs stored in the memory. Turning the power of the MG3710A/MG3740A off also deletes logs.

Remote command  Delete logs of the BER measurement
Command
[:SENSe]:BERT[:BASEband]:LOG:CLEar

Programming Example
To delete logs stored in the memory.
BERT:LOG:CLE
8.6.2 Saving BER logs: 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:BERT:LOG [<string>[,<device>]]

Parameter

<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> 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.

MMEM:STOR:BERT:LOG “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.

Table 8.6.2-1  BER Log Save Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Specifies a drive of the device to save BER Test Log.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Change Focus</td>
<td>Moves the cursor between dialog box and file list.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Delete</td>
<td>Deletes BER Test Log files.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Save</td>
<td>Saves BER Test Log as a file.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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.

Figure 8.6.2-1  BER Log Save Dialog Box and File List

Note:

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.
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.

Deleting BER log files: Delete

Deletes BER Log files.

Remote command

Delete BER Log files

Command

:MMEMory:DELete:BERT:LOG <string>[,<device>]

Parameter

<string>  File name excluding extension
Character string within 100 characters enclosed by double quotes (“”) or single quotes (‘’)
(excluding extension)
<device>  Number of the drive
Options   A to Z, currently selected drive when omitted

Programming Example

To delete the BER Log file “BER123” from D drive.

MMEM:DEL:BERT:LOG “BER123”,D

Operation method

Example: To select and delete BER Log files

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.
2. Press F1 Drive to select a destination drive for the file.
3. Select the BER Log files to delete from File List. When you press F5 Delete, the Confirmation function menu is displayed for your confirmation.

Table 8.6.2-2  Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Deletion</td>
<td>Deletes files.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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.
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.
Chapter 9 Other Functions

This chapter describes other functions such as Auxiliary, Utility, and panel key functions.

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.

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  9.2.2 Setting connection to power meters :
      Connection Settings ........................................... 9-10
  9.2.3 Power Meter setting: Channel Settings .......... 9-13
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Chapter 9  Other Functions

9.1 Auxiliary Function

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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
</table>
| 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". |
9.2 Power Meter

You can connect two USB power sensors to the MG3710A/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](image)

<table>
<thead>
<tr>
<th>No</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COM</td>
<td>COM Port number</td>
</tr>
<tr>
<td>2</td>
<td>Model</td>
<td>Model name of power sensor</td>
</tr>
</tbody>
</table>
| 3  | Connection | Connection status of the power sensor  
Off : The power sensor is Off.  
Connected : The power sensor is On and measurement is in progress.  
Disconnected : The power sensor is On and measurement is not in progress (Not connected) |
| 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 |
Measurement value

Indicates a measurement value of a power sensor. When a power sensor is on, this value is updated constantly. It includes a level offset.

Remote command

Query the power sensor measurement display value

Query

:SYSTem:PMETer[1]|2:MEASuer?

Response

<power> “–999.0” is returned when there is no value.

Parameter

<power> Level

Resolution 0.01 dB when dBm, 1 nW when W

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 measure using the Ch. A power sensor and read the result.

SYST:PMET:MEAS?

> –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.

![Power Meter in Resident Frame](image)

Figure 9.2-2  Power Meter in Resident Frame

### Table 9.2-2  Power Meter in Resident Frame

<table>
<thead>
<tr>
<th>No</th>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>Connection status or a measurement value of Ch. A</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>Connection status or a measurement value of Ch. B</td>
</tr>
</tbody>
</table>

### Table 9.2-3  Power Meter Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Channel A</td>
<td>Enables/disables measurement performed by the Ch. A power sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Channel A</td>
<td>Channel Setup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setup</td>
<td>Refer to 9.2.1 “Power Meter setting: Channel A/B Setup”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Channel B</td>
<td>Enables/disables measurement performed by the Ch. B power sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Channel B</td>
<td>Channel Setup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setup</td>
<td>Refer to 9.2.1 “Power Meter setting: Channel A/B Setup”.</td>
</tr>
</tbody>
</table>

Ch A/B power sensor On/Off: Channel A/B

![Auxiliary](image)

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
---|---
Query | :SYSTem:PMETer[1]|2[:STATe]?
Response | <boolean> 0 or 1
Parameter | <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
## Chapter 9 Other Functions

### 9.2.1 Power Meter setting: Channel A/B Setup

Press F2 Channel A Setup 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Connection Settings</td>
<td>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”.</td>
</tr>
<tr>
<td>F2</td>
<td>Channel Settings</td>
<td>Displays the Channel Settings function menu where you can set measurement. Refer to 9.2.3 “Power Meter setting: Channel Settings”.</td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>Zero Sensor</td>
<td>Zeros the levels of power sensors.</td>
<td></td>
</tr>
</tbody>
</table>

#### Zero adjustment: Zero 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**


**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
9.2 Power Meter

Operation 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/MG3740A.
2. Enter the information of the connected power sensor with Com Port number and Model to the MG3710A/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/MG3740A.

⚠️ CAUTION

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

While the Zero adjustment is in progress, the RF Output of the MG3710A/MG3740A is automatically set to Off.
9.2.2 Setting connection to power meters: 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.

### Table 9.2.2-1 Ch A/B Connection Function Menu

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

**COM Port setting: 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**


**Query**


**Response**

<ext_integer>
Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting range</th>
<th>Resolution</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM Port number</td>
<td>2 to 8</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

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

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.

Table 9.2.2-2  Sensor Model Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>MA24104A</td>
<td>600 MHz to 4 GHz</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>MA24105A</td>
<td>350 MHz to 4 GHz</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>MA24106A</td>
<td>50 MHz to 6 GHz (Default)</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>MA24108A</td>
<td>10 MHz to 8 GHz</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>MA24118A</td>
<td>10 MHz to 18 GHz</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>MA24126A</td>
<td>10 MHz to 26 GHz</td>
</tr>
</tbody>
</table>

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

MA24104A|MA24105A|MA24106A|MA24108A|MA24118A|MA24126A

Query


Response

<model>

Parameter

<model> Model name of power sensor
Options 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 Power Meter

9.2.3 Power Meter setting: Channel Settings

Perform 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Channel Freq 1.000000000 GHz</td>
<td>Sets a measurement frequency for the power sensor.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Channel Offset Off On</td>
<td>Enables/disables adding level offset to the value measured by the power sensor.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Channel Offset Value 0.00 dB</td>
<td>Sets the offset level value to be added to the power sensor reading.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Averaging Off On</td>
<td>Enables/disables the averaging for the measurement value with the power sensor.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Averaging Count Value 1024</td>
<td>Sets the averaging count for the measurement values with the power sensor.</td>
</tr>
<tr>
<td></td>
<td>F6</td>
<td>Measurement Units dBm W</td>
<td>Sets a unit to be used for displaying the value measured by the power sensor.</td>
</tr>
</tbody>
</table>
Channel Freq

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.

Table 9.2.3-2  Power Sensor Setting Range

<table>
<thead>
<tr>
<th>Power Sensor</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Resolution</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA24104A</td>
<td>600 MHz</td>
<td>4 GHz</td>
<td>1 kHz</td>
<td>1 GHz</td>
</tr>
<tr>
<td>MA24105A</td>
<td>350 MHz</td>
<td>4 GHz</td>
<td>100 kHz</td>
<td>1 GHz</td>
</tr>
<tr>
<td>MA24106A</td>
<td>50 MHz</td>
<td>6 GHz</td>
<td>1 kHz</td>
<td>1 GHz</td>
</tr>
<tr>
<td>MA24108A</td>
<td>10 MHz</td>
<td>8 GHz</td>
<td>100 kHz</td>
<td>1 GHz</td>
</tr>
<tr>
<td>MA24118A</td>
<td>10 MHz</td>
<td>18 GHz</td>
<td>100 kHz</td>
<td>1 GHz</td>
</tr>
<tr>
<td>MA24126A</td>
<td>10 MHz</td>
<td>26 GHz</td>
<td>100 kHz</td>
<td>1 GHz</td>
</tr>
</tbody>
</table>

Remote command

Set a measurement frequency for the power sensor

Command


Query


Response

<freq> Unit: Hz

Parameter

<freq> Frequency

Range

Refer to Table 9.2.3-2 Power Sensor Setting Range

Resolution

| MA24104A, MA24106A | 1 kHz      |
| MA24105A           | 100 kHz    |
| MA24108A, MA24118, MA24126 | 100 kHz |

Default

1 GHz

Suffix code

HZ, 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 800000000
SYST:PMET2:SENS:FREQ?
> 800 000 000

Level Offset: Channel Offset

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 level offset for the power sensor
Command

Query
Response
<boolean> 0 or 1

Parameter
<boolean> Level offset On/Off
OFF|0 Off (Default)
ON|1 On

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 level offset for the Ch. B power sensor to ON.
SYST:PMET2:SENS:CORR:GAIN2:STAT ON
SYST:PMET2:SENS:CORR:GAIN2:STAT?
> 1

Channel Offset Value

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 -100 dB to 100 dB
Resolution 0.01 dB
Default 0.00 dB

Remote command
Set an offset level for the power sensor

Command

Query

Response
<rel_ampl> Unit: dB

Parameter
<rel_ampl> Offset level
Setting range -100 to +100 dB
Resolution 0.01 dB
Default 0.00 dB
Suffix code DB, when omitted: DB

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 an offset level for the Ch. B power sensor to –15.00 dB.
SYST:PMET2:SENS:CORR:GAIN2  –15.00
SYST:PMET2:SENS:CORR:GAIN2?
>  –15.00

Averaging

Averaging or Top–Auxiliary, Power Meter → Channel A Setup or Channel B Setup, Channel Settings → Averaging

Enables/disables the averaging for the measurement value with the power sensor.

Press **F4 Averaging** on the Ch A/B Settings function menu to set it.

Off Does not perform averaging. (Default)
On Performs averaging.

Remote command

Enable/disable averaging

Command

Query
:SYSTem:PMETer[1]|2:SENSe:AVERage[:STATe]?

Response
<boolean> 0 or 1

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

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 ON.
SYST:PMET2:SENS:AVER ON
SYST:PMET2:SENS:AVER?
> 1
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 to 2048  
**Resolution**: 1  
**Default**: 1024

**Remote command**  
**Set the averaging count**  
**Command**:  

**Query**:  

**Response**:  
<ext_integer>

**Parameter**  
<ext_integer>  
The number of measurement points  
**Setting range**: 1 to 2048  
**Resolution**: 1  
**Default**: 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

Sets a unit to be used for displaying the value measured by the power sensor.

Press **F6 Measurement Units** on the Ch A/B Settings function menu to set it.

- **dBm**: Displays in dBm (Default).
- **W**: Displays in W.

**Remote command**

**Set the output level unit**

**Command**

```
```

**Query**

```
```

**Response**

```
<unit>
```

**Parameter**

```
<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 or :PMETer
- **For Ch. B**: :PMETer2

**Programming Example**

To set a unit to be used for displaying the output level of the Ch. B power meter to dBm.

```
SYST:PMET2:UNIT:POWER DBM
SYST:PMET2:UNIT:POWER?
> DBM
```
9.3 Alarm History

The MG3710A/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.

![Alarm History Dialog Box](image)

**Table 9.3-1 Alarm History Display**

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Alarm occurrence date, time</td>
</tr>
<tr>
<td>[7]RSVD</td>
<td>Not used</td>
</tr>
<tr>
<td>[6]RSVD</td>
<td>Not used</td>
</tr>
<tr>
<td>[5]RSVD</td>
<td>Not used</td>
</tr>
<tr>
<td>[4]RPP</td>
<td>RPP Alarm</td>
</tr>
<tr>
<td>[3]BB</td>
<td>Baseband Reference Clock PLL Alarm</td>
</tr>
<tr>
<td>[2]ALC</td>
<td>ALC Alarm</td>
</tr>
<tr>
<td>[1]RSVD</td>
<td>Not used</td>
</tr>
<tr>
<td>[0]REF</td>
<td>Reference Oscillator PLL Alarm</td>
</tr>
<tr>
<td>OK</td>
<td>Normal</td>
</tr>
<tr>
<td>NG</td>
<td>Alarm occurred.</td>
</tr>
</tbody>
</table>

For measures for Alarm, refer to 11.6 “Troubleshooting”.

**Table 9.3-2 Alarm History Function Menu**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F8</td>
<td>Save</td>
<td>Displays the Save Alarm History function menu where you can set alarm histories to save.</td>
</tr>
</tbody>
</table>

Refer to 9.3.1 “Saving Alarm History: Save”.
9.3 Alarm History

9.3.1 Saving Alarm History: Save

When an error occurs during operation of the MG3710A/MG3740A, an alarm is displayed, describing details. The alarm is kept as Alarm History. Using this function, you can save histories of alarms.

Remote command

Save Alarm History in an alarm file
Command
:MMEMory[1]|2:STORe:ALARm:LOG [<string>[,<device>]]

Parameter

<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>
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\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
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Operation method
Example: To name the currently displayed file as "Alarm20110624_000" and save it.

1. 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.

<table>
<thead>
<tr>
<th>Table 9.3.1-1 Alarm Save Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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.

4. 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.
Note:

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

When you press the Utility of the main function key, the MG3710A/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/MG3740A is in the utility setting mode, unless otherwise explained.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Interface Settings</td>
<td>Sets the interface for remote control. Refer to 9.4.1 “Interface Settings”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>System Settings</td>
<td>Performs common settings in the system. Refer to 9.4.2 “System Setting”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Instrument Info</td>
<td>Displays the status and factory shipment defaults of the MG3710A/MG3740A. Refer to 9.4.3 “Instrument Info”.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Install</td>
<td>Adds or deletes firmware, waveform licenses, and options. Refer to 9.4.4 “Install”.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Error Info</td>
<td>Displays the error information. Refer to 9.4.5 “Displaying Error Information: Error Info”.</td>
</tr>
</tbody>
</table>
9.4 Utility Function

9.4.1 Interface Settings

The MG3710A/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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>GPIB</td>
<td>Sets GPIB Address.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Terminator</td>
<td>Sets a terminator (end code) for a response message of controller sending, which is sent by a measuring instrument via remote control.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Language</td>
<td>Selects a language mode during remote control.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Raw Socket</td>
<td>Specifies a TCP/IP port number for transmitting the waveform data from IQproducer, which locates on an external PC, to the MG3710A/MG3740A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Port Number</td>
<td>49158</td>
</tr>
</tbody>
</table>

GPIB address: 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 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>
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Parameter

Parameter

Parameter

Programming Example

To set GPIB Address to 2.
SYST:COMM:GPIB:ADDR 2
SYST:COMM:GPIB:ADDR?
> 2

Terminator

or Top > Utility, > Interface Settings > Terminator

Sets a terminator (end code) for a response message of controller sending, which is sent by a measuring instrument via remote control.

Press F2 Terminator on the Interface Settings function menu to select a terminator.

CR  Adds CR+LF to transmit EOI (Default).
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

Parameter

Parameter

Programming Example

To set a terminator to CRLF.
SYST:COMM:GPIB:TERM CRLF
SYST:COMM:GPIB:TERM?
> CRLF
Selecting control language: 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 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

Specifies a TCP/IP port number for transmitting the waveform data from IQproducer, which locates on an external PC, to the MG3710A/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

Press F2 System Settings on the Utility function menu to display the System Setting function menu. Set common items in the system.

### Table 9.4.2-1 System Settings Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Beep Sound</td>
<td>Specifies On to make a beep or Off not to make it when displaying an error message.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off On</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F3</td>
<td>Power On</td>
<td>Specifies status of parameters when the power is on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Preset Last</td>
<td></td>
</tr>
</tbody>
</table>

**Beep**

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> Beep
- **ON|1** Enables a beep (Default).
- **Off|0** Disables a beep.

**Programming Example**

To disable a beep.

SYST:BEEP OFF
SYST:BEEP?
> 0
Parameters at power-on: Power On

*Top* or *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.

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>Keeps the status when the power is on and recovers them if the power goes on (Default).</td>
</tr>
<tr>
<td>Preset</td>
<td>Does not keep the status when the power is on and uses default values if the power goes on. Pressing <strong>Preset</strong> performs the same operation as initializing by pressing <strong>F1 Preset.</strong></td>
</tr>
</tbody>
</table>

**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> Status of parameters

LAST  
KEEPs the status when the power is off and recovers them if the power goes on (Default).

PRESet  
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 Utility Function

#### 9.4.3 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Product Info</td>
<td>Displays the Product Information dialog box where you can see the product information.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Instrument Options</td>
<td>Displays the Instrument Options dialog box where you can see the option information.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Board Info</td>
<td>Displays the Board Information dialog box where you can see the revision number of the board.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>FPGA Info</td>
<td>Displays the FPGA Info dialog box where you can see the FPGA version.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Waveform Licenses</td>
<td>Displays the Waveform Licenses dialog box where you can see the license number of the waveform data.</td>
</tr>
</tbody>
</table>

### Product Info

Press **F1 Product Info** on the Instrument Info function menu to display the **Product Information** dialog box.

- **Product Name**
- **Product Model**
- **Serial Number**
- **Firmware Version**
- **USB Product ID**
- **USB Vendor ID**
- **USB Serial Number**
- **Power On (Hours:Minutes:Seconds)**

#### Product Info

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>Product name</td>
</tr>
<tr>
<td>Product Model</td>
<td>Product model name</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Serial number of the system (hardware)</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>Version of this application</td>
</tr>
<tr>
<td>USB Product ID</td>
<td>Product ID of the USB port for remote control</td>
</tr>
<tr>
<td>USB Vendor ID</td>
<td>Vendor ID of the USB port for remote control</td>
</tr>
<tr>
<td>USB Serial Number</td>
<td>Serial number of the USB port for remote control</td>
</tr>
<tr>
<td>Power On (Hours:Minutes:Seconds)</td>
<td>Elapsed time since the power is turned to on</td>
</tr>
<tr>
<td>SG1 Frequency Setting Range</td>
<td>SG1 Frequency Setting Range</td>
</tr>
<tr>
<td>SG1 Level Setting Range</td>
<td>SG1 Level Setting Range</td>
</tr>
<tr>
<td>SG1 ARB Memory Size</td>
<td>SG1 Waveform Memory Size (MSamples)</td>
</tr>
<tr>
<td>SG1 AWGN</td>
<td>SG AWGN function On/Off</td>
</tr>
</tbody>
</table>
**Chapter 9  Other Functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG1 RPP Count</td>
<td>Number of circuit breaker trips by SG1 RPP</td>
</tr>
<tr>
<td>SG2 Frequency Setting Range</td>
<td>SG2 Frequency Setting Range</td>
</tr>
<tr>
<td>SG2 Level Setting Range</td>
<td>SG2 Level Setting Range</td>
</tr>
<tr>
<td>SG2 ARB Memory Size</td>
<td>SG2 Waveform Memory Size (MSamples)</td>
</tr>
<tr>
<td>SG2 AWGN</td>
<td>SG2 AWGN function On/Off</td>
</tr>
<tr>
<td>SG2 RPP Count</td>
<td>Number of circuit breaker trips by SG2 RPP</td>
</tr>
</tbody>
</table>

**Note:**
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:

<table>
<thead>
<tr>
<th>Remote command</th>
<th>Device information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
<td></td>
</tr>
</tbody>
</table>

**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

**Programming Example**

To query the device information.

*IDN?*

> ANRITSU, MG3710A, 6100000000, 1.00.00.
9.4 Utility Function

Remote command  Query the Product Type (product model name)
Query
:SYSTem:INFormation:MODel?

Response
<model>

Parameter
<model>  Product model name

Programming Example
To query the product model name.
SYST:INF:MOD?
> MG3710A

Remote command  Query Product Name (product name)
Query
:SYSTem:INFormation:TYPE?

Response
<type>

Parameter
<type>  Product name

Programming Example
To query the product name.
SYST:INF:TYPE?
> SIGNAL GENERATOR

Remote command  Query Serial Number (serial number)
Query
:SYSTem:INFormation:SERial?

Response
<serial>

Parameter
<serial>  Serial number

Programming Example
To query the serial number.
SYST:INF:SER?
> 6100000000
Remote command | Query Running Time (available time)
---|---
Query | :SYSTem:INFormation:RTIMe?
Response | <time>
Parameter | Running time<br>Suffix code | None, Unit: m (minutes)

Programming Example
To query the running time.
SYST:INF:RTIM?
> 100

Remote command | Query Firmware Version (the version of this application)
---|---
Query | Refer to the explanation of "*IDN?".

Instrument Options

Press F2 Instrument Options on the Instrument Info function menu to display the Instrument Options dialog box in the function display frame.

Number | Number of the installed hardware option
Name | Name of the hardware option
State | Status of On/Off switch

Remote command | Query the option information
---|---
Query | :SYSTem:HARDware:OPTion:CATalog?
Response | <total>,<number1>,<switch1>,<name1>,<number2>,<switch2>,<name2>...
Parameter | Total number of selectable options<br>Number of the option<br>Status of the option (On or Off) ON, OFF<br>Name of the option
9.4 Utility Function

Programming Example
To query the option information.
SYST: HARD: OPT: CAT?
> 1,001,ON,Rubidium Reference Oscillator

Board Info

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.

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

Query
: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
<revision> Revision number
Chapter 9  Other Functions

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 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 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
9.4 Utility Function

FPGA Info

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.

<table>
<thead>
<tr>
<th>Name</th>
<th>FPGA name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board</td>
<td>Installed FPGA board name</td>
</tr>
<tr>
<td>Version</td>
<td>Versions</td>
</tr>
</tbody>
</table>

**Remote command**

**Query the version number of FPGA**

**Query**

:SYSTem:FPGA:VERSion? <hardware>

**Response**

<version>

**Parameter**

<table>
<thead>
<tr>
<th>&lt;hardware&gt;</th>
<th>FPGA type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNTR_KEY</td>
<td>ControlPldAndPanel</td>
</tr>
<tr>
<td>HWC</td>
<td>HardwareControlFpga</td>
</tr>
<tr>
<td>MEAS_COM</td>
<td>MeasureComDsp</td>
</tr>
<tr>
<td>MEAS_CORE</td>
<td>MeasureCoreFpga</td>
</tr>
<tr>
<td>MEAS_PCI</td>
<td>MeasurePciFpga</td>
</tr>
<tr>
<td>SGBB</td>
<td>SgBbHardwareControlFpga</td>
</tr>
<tr>
<td>SGCTRL</td>
<td>SgControlFpga</td>
</tr>
<tr>
<td>SGRF</td>
<td>SgRfFpga</td>
</tr>
</tbody>
</table>

<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.

SYS:TEms:FPGA:VERS? CNTR_KEY

> 5
Remote command

Query the version numbers of all FPGAs

Query

:SYSTem:FPGA:VERSion:CATalog?

Response

<hardware1>,<version1>,<hardware2>,<version2>...

Parameter

<hardware>        FPGA type
    ControlPldAndPanel
    HardwareControlFpga
    MeasureComDsp
    MeasureCoreFpga
    MeasurePciFpga
    SgBbHardwareControlFpga
    SgControlFpga
    SgRfFpga
<version>         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,SgBbHardwareControlFpga,
    3,SgRfFpga,5,SgControlFpga,7,ControlPldAndPanel,5
Waveform Licenses

Displays 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.

Table 9.4.3-2  Waveform Licenses Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Install</td>
<td>Displays the Waveform Licenses function menu and the Waveform License Install dialog box.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>Uninstall</td>
<td>Selects a waveform license in the Waveform Licenses dialog box and deletes it.</td>
</tr>
</tbody>
</table>

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:WA\:LIC:COUN?  
> 3

**Remote command**

**Query a license name of waveform license specified with a number**

**Query**

:SYSTem:WAveform:LICense:NAME? <integer>

**Response**

<string>
Chapter 9  Other Functions

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;integer&gt;</td>
<td>Number</td>
<td>Setting range: 0 to (license count – 1)</td>
</tr>
<tr>
<td>Resolution</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>&lt;string&gt;</td>
<td>License name</td>
<td>Setting range: 0 to (license count – 1)</td>
</tr>
<tr>
<td></td>
<td>of the waveform license</td>
<td>Character string within 100 characters enclosed by double quotes (&quot; &quot;) or single quotes (' ') (excluding extension)</td>
</tr>
</tbody>
</table>

Programming Example

To query the license name of waveform license with #5.
SYST:WAV:LIC:NAME? 5
> "W-CDMA Waveform"

Remote command

Query a version number of waveform license specified with a number

Query
:SYSTem:WAVeform:LICense:VERSion? <integer>

Response

<numeric>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;integer&gt;</td>
<td>No.</td>
<td>Setting range: 0 to (license count – 1)</td>
</tr>
<tr>
<td>Resolution</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>&lt;numeric&gt;</td>
<td>Version number</td>
<td>Parameter: 0 to (license count – 1)</td>
</tr>
</tbody>
</table>

Programming Example

To query a version number of waveform license with #5.
SYST:WAV:LIC:VERS? 5
> 1.23

Remote command

Delete the waveform license specified with a name

Command
:SYSTem:WAVeform:LICense:DELeate <string>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;string&gt;</td>
<td>Name of waveform license</td>
<td>Character string within 100 characters enclosed by double quotes (&quot; &quot;) or single quotes (' ') (excluding file extension)</td>
</tr>
</tbody>
</table>

Programming Example

To delete the "W-CDMA License" waveform license.
SYST:WAV:LIC:DEL "W-CDMA License"
9.4 Utility Function

Remote command

Install a waveform license by specifying a license file

Command:
:SYSTem:WAVEform:LICense:INSTall \<string>[,<device>]\n
Parameter

\<string>\nName of a license file
Character string within 100 characters enclosed by double quotes (" ") or single quotes ( ‘ ’)
(excluding extension)

\<device>\nDrive number: A to Z, currently selected drive when omitted

Programming Example
To install the license file "LicenseFile" in D drive.
SYST:WAV: LIC:INST "LicenseFile",D

Operation method

Install or uninstall waveform licenses

Example: To install a waveform license.

1. Press F1 Install on the Waveform Licenses function menu to display the Waveform License Install dialog box and the Waveform License function menu.

<table>
<thead>
<tr>
<th>Function</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Name</td>
<td>File name</td>
</tr>
<tr>
<td>License Name</td>
<td>Name of waveform license</td>
</tr>
<tr>
<td>State</td>
<td>Not used</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Serial number</td>
</tr>
<tr>
<td>Version Limit</td>
<td>Versions are limited. Only the files with the displayed version number or earlier can be worked with.</td>
</tr>
</tbody>
</table>

2. Press F1 Drive to select a drive for containing waveform licenses.

   Options         | All connected drives

   Default          | C

3. The File List dialog box for the device selected in Step 2 appears and shows files.
4. When Waveform License Install is selected from the dialog box and F7 Install is pressed, the Confirmation function menu is displayed.

Table 9.4.3-4 Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm installation</td>
<td>Performs installation.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

5. Press F7 Confirm installation.

Example: Uninstalling Waveform License
1. Select the waveform license to be uninstalled at the Waveform License dialog 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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Uninstallation</td>
<td>Performs Uninstallation.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

3. Press F7 Confirm installation.
9.4 Utility Function

9.4.4 Install

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.

<table>
<thead>
<tr>
<th>Table 9.4.4-1  Install Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Updating firmware: Firmware

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.

1. 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 List dialog box.

<table>
<thead>
<tr>
<th>Table 9.4.4-2  Firmware Install Function Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page</strong></td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

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.
Chapter 9 Other Functions

Table 9.4.4-3 Confirmation Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm installation</td>
<td>Performs installation.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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.

Adding/deleting waveform licenses: 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

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

**Table 9.4.4-4  Option Install Function Menu**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Displays the Drive function menu where you can select a drive containing options.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Install</td>
<td>Displays the Confirmation function menu.</td>
</tr>
</tbody>
</table>

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
2. Select options to install in the Option Install dialog box and press F7 Install. The Confirmation function menu is displayed.

**Table 9.4.4-5  Confirmation Function Menu**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm installation</td>
<td>Performs installation.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

3. Press F7 Confirm installation to perform installation.
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/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.

**Figure 9.4.4-1  Factory Preset Message**

**Table 9.4.4-6  Factory Preset Function Menu**

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Reset To Factory Default</td>
<td>Performs System Preset and initialize parameters to the level at which past status does not affect operations at all.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns the menu before this menu is opened.</td>
</tr>
</tbody>
</table>
Confirm Reset To Factory Default

Perform Factory Preset and initialize parameters to the level at which past status does not affect operations at all.

Remote command

Initialize parameters to the level at which past status does not affect operations at all

Command
:SYSTem:FPReset

Programming Example

To perform the factory-level initialization.
SYST:FPR
9.4.5 Displaying Error Information: 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.

![Figure 9.4.5-1 Error Queue Dialog Box](image)

<table>
<thead>
<tr>
<th>ID</th>
<th>Error</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-310</td>
<td>System Error</td>
<td>Failed to load list file</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
</tbody>
</table>

**Note:**

Error information caused by remote control can be read using the following remote commands. The most recent 30 errors are saved.

Remote commands related to remote operation errors are shown below.

<table>
<thead>
<tr>
<th>Remote command</th>
<th>To read remote control error code and error message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
<td>:SYSTem:ERRor[:NEXT]?</td>
</tr>
</tbody>
</table>

**Response**

<code>
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>  
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>  
NORM, REM or LAST

Parameter | <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 the 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
Chapter 9  Other Functions

Table 9.4.5-1  Error Info Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Clear</td>
<td>Deletes error information.</td>
</tr>
</tbody>
</table>

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/MG3740A is powered-up to read and boot from the MG3710A/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/MG3740A.
2. 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/MG3740A.
5. Power-up the MG3710A/MG3740A.

Note:
Subsequently, neither the Boot loader Service program nor the MG3710A/MG3740A applications will start when Windows starts.

Installing Boot Loader Service

1. Disable the Boot Loader Service program as described above.
2. Click the Windows Start button and select Control Panel > Add or Remove Programs.
   (For Windows 7 Professional or Windows Embedded Standard 7, select Control Panel > Uninstall a program.)
3. Select “Anritsu Boot Loader Service for MG3710A” and delete it.
4. Connect a USB memory stick to the external PC and copy the installer file for the Boot Loader Service to be updated to the root folder of the USB memory stick.
5. Dismount the USB memory stick from the external PC and connect it to the MG3710A/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.
Chapter 9  Other Functions

9.5 Panel Keys

This section describes functions available only from keys on the front panel.

9.5.1 Preset

Press Preset of the panel key to display the Preset function menu.

Table 9.5.1-1  Preset Function Menu

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Preset</td>
<td>Performs Preset and resets all parameters managed by this application to default values, excluding those of the Utility function.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Preset All</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Restart</td>
<td>Turns the power OFF and executes restart.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

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
9.5 Panel Keys

Remote command

**Initialize the settings and status of the currently selected application**

**Command**

:SYSTem:PRESet

**Programming Example**

To initialize the settings and status of the currently selected application.

SYST:PRES

---

**Preset All**

Resets parameters managed by this application to default values, including those of the Utility function. In addition, List Table, Channel Table, and the waveform memory (with loaded waveform file) are initialized. However, the user correction data is not initialized. Press F3 **Preset All** for execution.

**Remote command**

**Reset parameters managed by this application to default values, including those of the Utility function**

**Command**

System All

:SYSTem:PRESet:ALL

**Programming Example**

To reset parameters including those of the Utility function.

SYST:PRES:ALL

---

**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

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).

<table>
<thead>
<tr>
<th>Remote command</th>
<th>Switch the remote-control state to the local-control state</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Command</strong></td>
<td>:SYSTem:COMMunicate:GTLocal</td>
</tr>
</tbody>
</table>

**Programming Example**
To switch the state to the local-control state.
SYST:COMM:GTL
9.5.3 Saving parameter file: Save

The MG3710A/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.

Press Save of the panel key to display the Parameter Save dialog box, the File List dialog box, and the Parameter Save function menu.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Displays the Drive function menu where you can set a destination drive for saving files.</td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Change Focus</td>
<td>Moves the cursor between dialog box and file list.</td>
</tr>
<tr>
<td></td>
<td>F5</td>
<td>Delete</td>
<td>Deletes the specified parameter file.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Save</td>
<td>Saves the settings and the status of the application in a parameter file.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

Remote command

Save the settings and the status of the application in a parameter file

Command

:MMEMory:STORe:STATe [<string> [,<device>]]

Parameter

$string$

File name excluding extension
Character string enclosed by double quotes (" ") or single quotes (’’) (excluding extension)
The following characters cannot be used:
\ / : * ? " ’ ‘ < > |
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.

$<device>$

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.

MMEM:STOR:STAT “TEST”,D

Deleting Parameter File: 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

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F7</td>
<td>Confirm Deletion</td>
<td>Executes delete.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

Press F7 Confirm Deletion to delete files.

Remote command

Delete the specified parameter file

Command

:MMEMory:DELe:STATe <filename>[,<device>]

Parameter

<filename> File name excluding extension
<device> Number of the drive
Options A to Z, currently selected drive when omitted

Programming Example

To delete the parameter file “TEST” stored in D drive.

MMEM:DELe:STAT “TEST”,D
The procedure of saving parameters is as follows:

Example: To save the currently displayed parameters in “ABC”.

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.

**Note:**

- 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:
    \ / : * ? “ ” ‘ ’ < > |
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.
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

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency setting</td>
<td>Frequency</td>
</tr>
<tr>
<td></td>
<td>Frequency Relative Display On/Off</td>
</tr>
<tr>
<td></td>
<td>Frequency Relative Value</td>
</tr>
<tr>
<td></td>
<td>Frequency Offset On/Off</td>
</tr>
<tr>
<td></td>
<td>Frequency Offset</td>
</tr>
<tr>
<td></td>
<td>Frequency Offset Multiplier On/Off</td>
</tr>
<tr>
<td></td>
<td>Frequency Offset Multiplier</td>
</tr>
<tr>
<td></td>
<td>Frequency/Channel Display</td>
</tr>
<tr>
<td></td>
<td>Frequency Display On/Off</td>
</tr>
<tr>
<td></td>
<td>Channel Group</td>
</tr>
<tr>
<td></td>
<td>Channel Selection</td>
</tr>
<tr>
<td></td>
<td>Channel Table *</td>
</tr>
<tr>
<td></td>
<td>Frequency Synchronization On/Off *</td>
</tr>
<tr>
<td></td>
<td>Frequency Synchronization Mode *</td>
</tr>
<tr>
<td></td>
<td>Phase Noise Optimization</td>
</tr>
<tr>
<td></td>
<td>RF Spectrum</td>
</tr>
<tr>
<td></td>
<td>Reference Frequency Source *</td>
</tr>
<tr>
<td></td>
<td>Reference Frequency</td>
</tr>
<tr>
<td></td>
<td>Local Signal Source</td>
</tr>
<tr>
<td></td>
<td>Local Signal Output *</td>
</tr>
<tr>
<td></td>
<td>Local Signal Phase</td>
</tr>
<tr>
<td>Output level</td>
<td>RF Output On/Off</td>
</tr>
<tr>
<td></td>
<td>Output Level</td>
</tr>
<tr>
<td></td>
<td>Display Unit</td>
</tr>
<tr>
<td></td>
<td>Output Level Relative Display On/Off</td>
</tr>
<tr>
<td></td>
<td>Output Level Relative Value</td>
</tr>
<tr>
<td></td>
<td>Output Level Offset On/Off</td>
</tr>
<tr>
<td></td>
<td>Output Level Offset</td>
</tr>
<tr>
<td></td>
<td>Limit Level On/Off</td>
</tr>
<tr>
<td></td>
<td>Limit Level</td>
</tr>
<tr>
<td></td>
<td>Output Level Synchronization On/Off *</td>
</tr>
<tr>
<td></td>
<td>User Correction On/Off</td>
</tr>
<tr>
<td></td>
<td>User Correction Table *</td>
</tr>
<tr>
<td></td>
<td>S/N Optimization On/Off</td>
</tr>
<tr>
<td>User correction</td>
<td>Com Port</td>
</tr>
<tr>
<td></td>
<td>Model</td>
</tr>
<tr>
<td></td>
<td>Start Freq</td>
</tr>
<tr>
<td></td>
<td>Stop Freq</td>
</tr>
<tr>
<td></td>
<td>Level Offset On/Off</td>
</tr>
<tr>
<td></td>
<td>Level Offset value</td>
</tr>
<tr>
<td></td>
<td>Correction Points</td>
</tr>
<tr>
<td></td>
<td>Averaging On/Off</td>
</tr>
<tr>
<td></td>
<td>Averaging Count</td>
</tr>
</tbody>
</table>
Table 9.5.3-3  Items Saved in a Parameter File (Cont’d)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sweep/List function</strong></td>
<td>Sweep/List Freq On/Off</td>
</tr>
<tr>
<td></td>
<td>Sweep/List Freq On/Off</td>
</tr>
<tr>
<td></td>
<td>Sweep/List Type *</td>
</tr>
<tr>
<td></td>
<td>Sweep Repeat *</td>
</tr>
<tr>
<td></td>
<td>Sweep Direction *</td>
</tr>
<tr>
<td></td>
<td>Manual Mode On/Off *</td>
</tr>
<tr>
<td></td>
<td>Manual Point *</td>
</tr>
<tr>
<td></td>
<td>Sweep Out Setting *</td>
</tr>
<tr>
<td></td>
<td>Sweep Start Frequency</td>
</tr>
<tr>
<td></td>
<td>Sweep Stop Frequency</td>
</tr>
<tr>
<td></td>
<td>Sweep Center Frequency</td>
</tr>
<tr>
<td></td>
<td>Sweep Span Frequency</td>
</tr>
<tr>
<td></td>
<td>Sweep Start Level</td>
</tr>
<tr>
<td></td>
<td>Sweep Stop Level</td>
</tr>
<tr>
<td></td>
<td>Sweep Point</td>
</tr>
<tr>
<td></td>
<td>Sweep Dwell Time</td>
</tr>
<tr>
<td></td>
<td>Sweep Type</td>
</tr>
<tr>
<td></td>
<td>List Frequency Setting</td>
</tr>
<tr>
<td></td>
<td>List Level Setting</td>
</tr>
<tr>
<td></td>
<td>List Table *</td>
</tr>
</tbody>
</table>
### Table 9.5.3-3  Items Saved in a Parameter File (Cont’d)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
</table>
| **Modulation function** | Modulation On/Off  
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)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulation function</td>
<td>Selected Waveform Package Name *</td>
</tr>
<tr>
<td></td>
<td>Selected Waveform Pattern Name *</td>
</tr>
<tr>
<td></td>
<td>Waveform Copy List Focus *</td>
</tr>
<tr>
<td></td>
<td>RF Gate On/Off</td>
</tr>
<tr>
<td></td>
<td>RF Gate Edit On/Off</td>
</tr>
<tr>
<td></td>
<td>RF Gate Line</td>
</tr>
<tr>
<td></td>
<td>RF Gate Offset 1</td>
</tr>
<tr>
<td></td>
<td>RF Gate Width 1</td>
</tr>
<tr>
<td></td>
<td>RF Gate Offset 2</td>
</tr>
<tr>
<td></td>
<td>RF Gate Width 2</td>
</tr>
<tr>
<td></td>
<td>RF Gate Frequency</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger On/Off</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger Mode</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger Source</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger Delay</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger Edge</td>
</tr>
<tr>
<td></td>
<td>Start/Frame Trigger Event</td>
</tr>
<tr>
<td></td>
<td>Baseband Reference Clock Source</td>
</tr>
<tr>
<td></td>
<td>Baseband Reference Clock Division *</td>
</tr>
<tr>
<td></td>
<td>Baseband Reference Clock Out *</td>
</tr>
<tr>
<td></td>
<td>Marker1 Edit Mode A On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker1 Offset A</td>
</tr>
<tr>
<td></td>
<td>Marker1 Width A</td>
</tr>
<tr>
<td></td>
<td>Marker1 Cycle A</td>
</tr>
<tr>
<td></td>
<td>Marker1 Polarity A</td>
</tr>
<tr>
<td></td>
<td>Marker1 Edit Mode B On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker1 Offset B</td>
</tr>
<tr>
<td></td>
<td>Marker1 Width B</td>
</tr>
<tr>
<td></td>
<td>Marker1 Cycle B</td>
</tr>
<tr>
<td></td>
<td>Marker1 Polarity B</td>
</tr>
<tr>
<td></td>
<td>Marker2 Edit Mode A On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker2 Offset A</td>
</tr>
<tr>
<td></td>
<td>Marker2 Width A</td>
</tr>
<tr>
<td></td>
<td>Marker2 Cycle A</td>
</tr>
<tr>
<td></td>
<td>Marker2 Polarity A</td>
</tr>
<tr>
<td></td>
<td>Marker2 Edit Mode B On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker2 Offset B</td>
</tr>
<tr>
<td></td>
<td>Marker2 Width B</td>
</tr>
<tr>
<td></td>
<td>Marker2 Cycle B</td>
</tr>
<tr>
<td></td>
<td>Marker2 Polarity B</td>
</tr>
<tr>
<td></td>
<td>Marker3 Edit Mode A On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker3 Offset A</td>
</tr>
<tr>
<td></td>
<td>Marker3 Width A</td>
</tr>
<tr>
<td></td>
<td>Marker3 Cycle A</td>
</tr>
<tr>
<td></td>
<td>Marker3 Polarity A</td>
</tr>
<tr>
<td></td>
<td>Marker3 Edit Mode B On/Off</td>
</tr>
<tr>
<td></td>
<td>Marker3 Offset B</td>
</tr>
</tbody>
</table>
Table 9.5.3-3  Items Saved in a Parameter File (Cont’d)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
</table>
| **Modulation function** | Marker3 Width B  
                  | 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 Slaves *  
                  | Slave 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)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I/Q modulation</strong></td>
<td>I/Q Source</td>
</tr>
<tr>
<td></td>
<td>I/Q Output</td>
</tr>
<tr>
<td></td>
<td>Internal Channel Correction</td>
</tr>
<tr>
<td></td>
<td>Cal Type</td>
</tr>
<tr>
<td></td>
<td>Wideband</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Input I Offset *</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Input Q Offset *</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Output I Level Trimming *</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Output Q Level Trimming *</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Output I/Q Common Offset*</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Output I Diff Offset *</td>
</tr>
<tr>
<td></td>
<td>Analog I/Q Output Q Diff Offset *</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband I Offset</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband Q Offset</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband Gain Balance</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband Quad. Angle</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband I/Q Phase</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband I/Q Skew</td>
</tr>
<tr>
<td></td>
<td>Internal Baseband I/Q Delay</td>
</tr>
<tr>
<td><strong>BER measurement</strong></td>
<td>Measure Mode *</td>
</tr>
<tr>
<td></td>
<td>Data Type *</td>
</tr>
<tr>
<td></td>
<td>Count Mode</td>
</tr>
<tr>
<td></td>
<td>Data *</td>
</tr>
<tr>
<td></td>
<td>Error *</td>
</tr>
<tr>
<td></td>
<td>Auto Resync *</td>
</tr>
<tr>
<td></td>
<td>Threshold X *</td>
</tr>
<tr>
<td></td>
<td>Threshold Y *</td>
</tr>
<tr>
<td></td>
<td>at SyncLoss *</td>
</tr>
<tr>
<td></td>
<td>BER Interface Clock Edge *</td>
</tr>
<tr>
<td></td>
<td>BER Interface Data Polarity *</td>
</tr>
<tr>
<td></td>
<td>BER Interface Enable Active *</td>
</tr>
<tr>
<td></td>
<td>PN Fix Pattern Length *</td>
</tr>
<tr>
<td></td>
<td>User Defined Pattern Pattern Length *</td>
</tr>
<tr>
<td></td>
<td>User Defined Pattern Sync Start *</td>
</tr>
<tr>
<td></td>
<td>User Defined Pattern Sync Length *</td>
</tr>
<tr>
<td></td>
<td>PN Fix9 Pattern Initial</td>
</tr>
<tr>
<td></td>
<td>PN Fix11 Pattern Initial</td>
</tr>
<tr>
<td></td>
<td>PN Fix15 Pattern Initial</td>
</tr>
<tr>
<td></td>
<td>PN Fix20 Pattern Initial</td>
</tr>
<tr>
<td></td>
<td>PN Fix23 Pattern Initial</td>
</tr>
<tr>
<td></td>
<td>Pattern Length</td>
</tr>
<tr>
<td></td>
<td>Sync Start</td>
</tr>
<tr>
<td></td>
<td>Sync Length</td>
</tr>
</tbody>
</table>
### Table 9.5.3-3  Items Saved in a Parameter File (Cont’d)

<table>
<thead>
<tr>
<th>System</th>
<th>Items</th>
</tr>
</thead>
</table>
| 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)
- The type of the displayed function menu. The MG3710A/MG3740A always displays the top-level function menu after loading the setting.
- Status of entered/displayed dialog boxes
- 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/MG3740As. Refer to *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)* for how to transmit it.
9.5.4 Recalling Parameter File: 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/MG3740A may start with undefined parameters.

**Note:**
The set parameter settings file cannot be recalled with a different option configuration.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive C:</td>
<td>Displays the Drive function menu where you can set a source drive for loading files.</td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Open</td>
<td>Performs loading settings.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

**Open**

Loads the parameter file specified in the File List dialog box.
Press F7 Open to load a setting file.

**Remote command**
Recall the application settings and status into a parameter file

**Command**
:MMEMory:LOAD:STATe <string>[,<device>]

**Parameter**

- **<string>**
  File name excluding extension
  Character string enclosed by double quotes (" ")
  or single quotes (’’) (excluding extension)

- **<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
```
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>

Response

<number>,<filename_1>,<filename_2>...

Parameter

<device> Number of the drive
Options A to Z, currently selected drive when omitted
<number> Number of files: 0 to 1000
<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
The procedure of loading parameters is as follows:

Example: To load a parameter file.

1. 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.

**Note:**

File names are listed in alphanumeric order.

If no parameter file exists, the “File not found” is displayed.

Parameter files created with one MG3710A/MG3740A can be loaded by another MG3710A/MG3740A, but check firmware versions installed on each MG3710A/MG3740A. When the firmware version of the MG3710A/MG3740A that loads parameter files is older than the one that saves files, files cannot be loaded successfully.
Chapter 9 Other Functions

9.5.5 Screen copy: Copy

Copies the screen displayed on the MG3710A/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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Drive</td>
<td>Displays the Drive function menu where you can set a destination drive for saving the screen copy.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>File Type</td>
<td>Sets the file format of the screen copy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PNG</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Color</td>
<td>Sets the color of the screen copy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F4</td>
<td>Change</td>
<td>Moves the cursor between dialog box and file list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F7</td>
<td>Save</td>
<td>Copies the screen.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the previous menu.</td>
</tr>
</tbody>
</table>

Setting a destination drive for screen copies: 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: C

Setting a file format for screen copies: 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 format
BMP  BMP format
PNG  PNG 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

Press F3 Color on the Screen Copy function menu to display the Copy
Color function menu and set copy.

Normal  Color, the same as the displayed screen (Default)
Reverse  Color, reversed
Monochrome  Monochrome
Reversed Monochrome  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?
Response
<mode>  NORM, REV, MONO or MREV

Parameter
<mode>  Settings of colors
NORMal  Color, the same as the displayed screen (Default)
REVerse  Color, reversed
MONochrome  Monochrome
MREVerse  Monochrome, reversed

Programming Example
To set the screen hardcopy to reverse color.
MMEM:STOR:SCR:THEM REV
MMEM:STOR:SCR:THEM?
> 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 names and save the screen copy
Command
:MMEMory:STORe:SCReen [<string>[,<device>]]

Parameter
<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>  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\nUp 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.
6. 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.

Note:
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.
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.

<table>
<thead>
<tr>
<th>Remote command</th>
<th>Turn the display On/Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td>:DISPlay:ENABle &lt;boolean&gt;</td>
</tr>
<tr>
<td>Query</td>
<td>:DISPlay:ENABle?</td>
</tr>
<tr>
<td>Response</td>
<td>&lt;boolean&gt; 0 or 1</td>
</tr>
<tr>
<td>Parameter</td>
<td>&lt;boolean&gt; Screen display On/Off</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>ON</td>
</tr>
</tbody>
</table>

Details
When you press the Local, the LCD backlight automatically turns ON.

Programming Example
To disable displaying screens.
DISP:ENAB OFF
DISP:ENAB?
> 0
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, keyboard, 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.

<table>
<thead>
<tr>
<th>Page</th>
<th>Key No.</th>
<th>Menu Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F1</td>
<td>Calibrate Level</td>
<td>Performs the level calibration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 5.3.6 “Calibrate Level”.</td>
</tr>
<tr>
<td></td>
<td>F2</td>
<td>I/Q Cal</td>
<td>Displays the IQ Calibration function menu to set the settings related to I/Q quadrature modulator calibration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 7.6.1 “I/Q Calibration”.</td>
</tr>
<tr>
<td></td>
<td>F3</td>
<td>Internal Channel Correction Off On</td>
<td>Enables/disables the baseband in-band correction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Refer to 7.6 “IQ Modulation”.</td>
</tr>
<tr>
<td></td>
<td>F8</td>
<td>Cancel</td>
<td>Returns to the menu before this menu is opened.</td>
</tr>
</tbody>
</table>

**Notes:**

- Execute Calibrate Level while the device to be tested is connected to the RF connector of the MG3710A/MG3740A.

- Executing Calibrate Level with the RF connector opened may degrade the level accuracy of output signals because of reflection.
Chapter 9 Other Functions

9.6 Touch Panel

The MG3710A/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. For details, refer to the operation manual for the DMC touch panel application included in the attached CD.

To calibrate the touch panel:

1. Press 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.

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.

6. 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).
9.7 Setting Windows

The MG3710A/MG3740A uses Microsoft Windows Embedded Standard 2009, Windows 7 Professional, or Windows Embedded Standard 7 (hereinafter, referred to as “Windows”) as the operating system. 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/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/MG3740A and perform the steps below.
1. Click the Start menu on the Windows taskbar.
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 9.7-1 Windows Embedded Standard 2009
Figure 9.7-2 Windows 7 Professional
Figure 9.7-3 Windows Embedded Standard 7

![System Properties Window]

- System type: Windows Embedded Standard
- Processor: CPU N270 @ 1.60GHz

Figure 9.7-1 Windows Embedded Standard 2009
Chapter 9  Other Functions

Figure 9.7-2  Windows 7 Professional

Processor: CPU N270 @ 1.60GHz
System Type: 32-bit Operating System

Figure 9.7-3  Windows Embedded Standard 7

Processor: CPU 2000E @ 2.20GHz
System Type: 64-bit Operating System
Setting Windows

The MG3710A/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/MG3740A to its status at factory shipment. Refer to 9.7.6 “System Recovery Functions” for details.

⚠️ WARNING

MG3710A/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.

⚠️ WARNING

Performing system recovery will cause software installation (including updates) after factory shipment of the MG3710A/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 the USB mouse included as standard equipment and a compatible keyboard (USB).

The following are methods to display the Windows Desktop. To display applications of the MG3710A/MG3740A again, press $\text{F1}$ or $\text{F2}$, or select an application in the Windows Taskbar.

**Mouse**
Right-click anywhere on the screen, and click **Show the desktop** to display the Desktop.
Or, click the “Minimize” button located in the upper right corner of the application window of the MG3710A/MG3740A. Minimizing all applications displays the Desktop.

Press $\text{Windows} + \text{D}$ on the front panel or right click, and click the **Show the Desktop** on the displayed menu.

**Keyboard**
Pressing the **Windows + D** minimizes all windows and displays the Windows Desktop.
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 (Table 9.7.2-1 and 9.7.2-2).

Avoid changing settings listed in Table 9.7.2-1 and 9.7.2-2.

Click **Start** in the Taskbar and then click **Control Panel** to open the Control Panel. The Taskbar is displayed by moving the cursor to the bottom edge of the screen.

![Control Panel (Windows Embedded Standard 2009)](image)

Figure 9.7.2-1  Control Panel (Windows Embedded Standard 2009)
## Table 9.7.2-1 Description of Control Panel (Windows Embedded Standard 2009)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Add Hardware**                 | - Do not delete devices already installed, or update or remove drivers.  
- The MG3710A/MG3740A may not operate normally due to conflicts with device drivers when new hardware is added. |
| **Add or Remove Programs**       | - Do not update or remove programs installed at factory shipment.  
- MG3710A/MG3740A operations are not guaranteed when programs not guaranteed by Anritsu Corporation are installed. |
| **Administrative Tools**         | - Do not change settings.                                                                                                                                 |
| **Automatic Update**             | - Not available                                                                                                                                 |
| **Date and Time**                | - You can change the date, time and time zone.  
- Internet Time is set to Off at factory shipment. Operations may be affected; therefore, do not change this setting. |
| **Display**                      | **Intel® GMA Driver for Mobile**  
- This setting must be changed when connecting an external monitor to the VGA connector of the MG3710A/MG3740A for use. See 9.7.3 “Using external display” for details.  
- Changing the screen resolution, refresh rate or monitor power management, or enabling the screen saver may cause operations to be performed abnormally. |
| **Fonts**                        | - Fonts required for applications of the MG3710A/MG3740A are installed at factory shipment; therefore, do not delete these fonts. |
### Table 9.7.2-1 Description of Control Panel (Windows Embedded Standard 2009) (Cont’d)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network Connections</strong></td>
<td>- TCP/IP settings may change when the MG3710A/MG3740A is remote-controlled via the Ethernet. Refer to Appendix E.3.2 “Ethernet interface settings” for details.</td>
</tr>
<tr>
<td></td>
<td>- The IP address is set to use DHCP at factory shipment. Ensure that the network administrator settings are appropriate when connecting the MG3710A/MG3740A to a network.</td>
</tr>
<tr>
<td><strong>Power Options</strong></td>
<td>- The settings for the Auto Power Off function (Turn off Monitor) of the display can be changed.</td>
</tr>
<tr>
<td></td>
<td>- The Power Off function of the hard disk (Turn off Hard Disks) is disabled (Never). Do not change settings.</td>
</tr>
<tr>
<td></td>
<td>- Do not change power option settings other than those described above. The MG3710A/MG3740A will not operate normally after recovering from hibernation.</td>
</tr>
<tr>
<td><strong>Printer and Faxes</strong></td>
<td>- Printers and fax machines can be set. However, operations are not guaranteed in the event print drivers or relevant applications affect the MG3710A/MG3740A.</td>
</tr>
<tr>
<td><strong>Regional and Language Options</strong></td>
<td>- Do not change this setting. Applications may not operate normally.</td>
</tr>
<tr>
<td><strong>Security Center</strong></td>
<td>- Firewall settings are set to Off at factory shipment. Refer to 9.7.7 “Windows Security Measures” for details.</td>
</tr>
<tr>
<td></td>
<td>When the setting is changed from Off to On, a dialog for checking whether the Windows Firewall blocks applications of the MG3710A/MG3740A when the applications are started the next time is displayed. Select “Unblock” at this time.</td>
</tr>
<tr>
<td></td>
<td>- Antivirus software is not installed at factory shipment. The remote control function using the Ethernet of the MG3710A/MG3740A and IQproducer may not operate in the event functions for blocking external communications are operating.</td>
</tr>
<tr>
<td></td>
<td>- Warnings from the Security Center are set to not be displayed at factory shipment.</td>
</tr>
</tbody>
</table>
### Table 9.7.2-1 Description of Control Panel (Windows Embedded Standard 2009) (Cont’d)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **System**                    | • The Computer Name can be changed. The name is set as “SN” + “Serial Number” at factory shipment.  
                                • Do not change Hardware or Advanced settings.                                                                                                      |
| **Taskbar and Start Menu**    | • Do not change settings.                                                                                                                                                                                   |
| **User Accounts**             | • Automatic login is set under the following settings at factory shipment. Do not change the User Account settings shown below.  
                                Account Name “ANRITSU”  
                                Password “anritsu”  
                                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 startup normally with user accounts created using Limited (Power User). |
| **Windows Firewall**          | • Firewall settings are set to Off at factory shipment.  
                                Refer to 9.7.7 “Windows Security Measures” for details.  
                                When the setting is changed from Off to On, a dialog for checking whether the Windows Firewall blocks applications of the MG3710A/MG3740A when applications are started the next time is displayed. Be sure to select “Unblock” at this time. |
9.7 Setting Windows

Figure 9.7.2-2  Control Panel (Windows 7 Professional or Windows Embedded Standard 7)
### Table 9.7.2-2  Control Panel (Windows 7 Professional or Windows Embedded Standard 7)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Administrative Tools**  | • Configures computer management related settings.  
• Do not change this setting.                                                                                                                   |
| **Date and Time**         | • Sets date, time and time zone.  
• These settings may be changed if necessary.  
• Internet Time is set to Off at factory shipment. Operations may be affected; therefore, do not change this setting. |
| **Device Manager**        | • Displays and changes hardware settings.  
• Do not delete devices already installed, or update or remove drivers.  
• The MG3710A/MG3740A may not operate normally due to conflicts with device drivers when new hardware is added. |
| **Device and Printers**   | • Displays and manages devices, printers and print jobs.  
• Printers and fax machines can be set. However, operations are not guaranteed in the event print drivers or relevant applications affect the MG3710A/MG3740A. |
| **Display**               | • Changes display settings for easier reading of screen displays.  
• This setting must be changed when connecting an external monitor to the VGA connector of the MG3710A/MG3740A for use. See 9.7.3 “Using external display” for details.  
• Changing the screen resolution, refresh rate or monitor power management, or enabling the screen saver may cause operations to be performed abnormally. |
| **Fonts**                 | • Adds, updates and manages computer fonts.  
• Fonts required for applications of the MG3710A/MG3740A are installed at factory shipment; therefore, do not delete these fonts. |
| **Networking and Sharing Center** | • Checks network status, changes network settings, and sets file and printer sharing.  
• When performing remote control over Ethernet, sometimes the TCP/IP settings are changed. For details, refer to Appendix E.3.2 “Setting Ethernet Interface”.  
• The IP address is set to use DHCP at factory shipment. Ensure that the network administrator settings are appropriate when connecting the MG3710A/MG3740A to a network. |
### Table 9.7.2-2  Control Panel (Windows 7 Professional or Windows Embedded Standard 7) (Cont’d)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Options</strong></td>
<td>• Selects computer power management methods to optimize performance with different power sources.</td>
</tr>
<tr>
<td></td>
<td>• The settings for the Auto Power Off function (Turn off Monitor) of the display can be changed.</td>
</tr>
<tr>
<td></td>
<td>• The Power Off function of the hard disk (Turn off Hard Disks) is disabled (Never). Do not change this setting.</td>
</tr>
<tr>
<td></td>
<td>• Do not change power option settings other than those described above. The MG3710A/MG3740A will not operate normally after recovering from hibernation.</td>
</tr>
<tr>
<td><strong>Programs and Features</strong></td>
<td>• Installs and changes programs installed on computer.</td>
</tr>
<tr>
<td></td>
<td>• Do not update or remove programs installed at factory shipment.</td>
</tr>
<tr>
<td></td>
<td>• MG3710A/MG3740A operations are not guaranteed when programs not guaranteed by Anritsu Corporation are installed.</td>
</tr>
<tr>
<td><strong>Recovery</strong></td>
<td>• Not available</td>
</tr>
<tr>
<td><strong>Region and Language</strong></td>
<td>• Customizes language, numeric, time and date style settings.</td>
</tr>
<tr>
<td></td>
<td>• Do not change this setting. Applications may not operate normally.</td>
</tr>
<tr>
<td><strong>System</strong></td>
<td>• Displays information on computer and changes hardware, performance and remote connection settings.</td>
</tr>
<tr>
<td></td>
<td>• The Computer Name can be changed. The name is set as “SN” + “Serial Number” at factory shipment.</td>
</tr>
<tr>
<td></td>
<td>• Do not change Hardware or Advanced settings.</td>
</tr>
<tr>
<td><strong>Taskbar and Start Menu</strong></td>
<td>• Customizes items and displays in Start menu and Taskbar.</td>
</tr>
<tr>
<td></td>
<td>• Do not change this setting.</td>
</tr>
<tr>
<td><strong>User Account</strong></td>
<td>• Sets computer user accounts and password settings.</td>
</tr>
<tr>
<td></td>
<td>• Automatic login is set under the following settings at factory shipment. Do not change the User Account settings shown below.</td>
</tr>
<tr>
<td></td>
<td>Account Name</td>
</tr>
<tr>
<td></td>
<td>Password</td>
</tr>
<tr>
<td></td>
<td>Account Type</td>
</tr>
<tr>
<td></td>
<td>• New user accounts can be created. Specify “Computer Administrator” for the account type of the user account to be created. Applications will not startup normally with user accounts created using Limited (Power User).</td>
</tr>
</tbody>
</table>
Table 9.7.2-2  Control Panel (Windows 7 Professional or Windows Embedded Standard 7)  
(Cont’d)

<table>
<thead>
<tr>
<th>Setting Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Anytime Upgrade</td>
<td>• Not available</td>
</tr>
<tr>
<td>Windows Firewall</td>
<td>• Helps assure security against hackers and malicious software by setting firewall security.</td>
</tr>
<tr>
<td></td>
<td>• Windows Firewall setting depends on the factory shipping date as shown below.</td>
</tr>
<tr>
<td></td>
<td>– Shipped in or before September 2018 Off</td>
</tr>
<tr>
<td></td>
<td>– Shipped in or after October 2018 On</td>
</tr>
<tr>
<td></td>
<td>Refer to 9.7.7 “Windows Security Measures” for details.</td>
</tr>
<tr>
<td></td>
<td>When the setting is changed from Off to On, a dialog for checking whether the Windows Firewall blocks applications of the MG3710A/MG3740A when applications are started the next time is displayed. Be sure to select “Unblock” at this time.</td>
</tr>
<tr>
<td></td>
<td>• Antivirus software is not installed at factory shipment.</td>
</tr>
<tr>
<td></td>
<td>Blocking external communications may prevent remote control over Ethernet and IQproducer operations.</td>
</tr>
<tr>
<td>Windows Update</td>
<td>• Not available during measurement.</td>
</tr>
<tr>
<td></td>
<td>Refer to 9.7.7 “Windows Security Measures” for details.</td>
</tr>
</tbody>
</table>
9.7.3 Using external display

An external display can be connected to the VGA connector on the rear side of the MG3710A/MG3740A, to display screens of the MG3710A/MG3740A and show multiple displays. The following describes the operation procedure for this function.

![Intel® GMA Driver Setting Screen](image)

**Figure 9.7.3-1 Intel® GMA Driver Setting Screen**

<Procedure>

1. Connect the display to the VGA connector on the rear side of the MG3710A/MG3740A.
   When using Windows 7 Professional or Windows Embedded Standard 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.
3. Change the Display Devices settings as shown below:

   **When not using an external display**
   - Single Display Notebook

   **When using only an external display**
   - Single Display Monitor

   **When displaying the MG3710A/MG3740A display to an external display**
   - Multiple Display Twin or Intel® Dual Display Clone
   - Primary Device Notebook
     (MG3710A/MG3740A display)
   - Secondary Device Monitor

   **When displaying with the MG3710A/MG3740A and external display connected**
   - Multiple Display Extended Desktop
   - Primary Device Notebook
     (MG3710A/MG3740A display)
   - Secondary Device Monitor

4. Press either the **OK** or **Apply** button.

---

**CAUTION**

Turning the MG3710A/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.

---

**CAUTION**

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/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/MG3740A operations.
- Note that the MG3710A/MG3740A may not operate normally when registries are changed.
9.7.5 Storage device configuration

The MG3710A/MG3740A has a built-in hard disk for storing the operating system, application software, user data, and the like.

The hard disk of the MG3710A/MG3740A consists of the following partitions.

Volume C : System Disk

Windows, application software and files required for operation of the MG3710A/MG3740A are stored. Also, it is used as the destination for file input or output for application software of the MG3710A/MG3740A. The MG3710A/MG3740A may not operate normally when data necessary for operations of the MG3710A/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/MG3740A. Adding data to this volume or deleting data on it will not affect MG3710A/MG3740A operations.

A USB memory, used for installing application software and inputting or outputting data, is included as standard equipment with the MG3710A/MG3740A.

Volume D : USB memory (when the 2ndary HDD option is not installed)

Volume E : USB memory (when the 2ndary HDD option is installed)

Note the following items when operating MG3710A/MG3740A:

- Do not change the partition configuration. Doing so may affect system operation.
- Do not format the hard disk of the MG3710A/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 Setting Windows

9.7.6 System Recovery Functions

The MG3710A/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 MG3710A/MG3740A comes with factory-installed recovery software, Phoenix Recover Pro or Paragon Drive Backup. To confirm the installed recovery software, start the MG3710A/MG3740A, and press the F4 on the BIOS screen to start the recovery software.

<Procedure>
1. Disconnect the MG3710A/MG3740A from the network if connected.
2. Connect the keyboard and mouse to the mainframe, and then turn the MG3710A/MG3740A power On. The BIOS screen will appear in a few seconds after.
3. Press the F4 (not 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 “Phoenix Recover Pro” in this section.
   Paragon Drive Backup
   Refer to “Paragon Drive Backup” in this section.

⚠️ CAUTION

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 Windows 7 Professional or Windows Embedded Standard 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.
CAUTION

- 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.

The backup can be obtained by copying the User Data folder in the path: C:\Anritsu\MG3710A. For Windows 7 Professional or Windows Embedded Standard 7, copy the User Data folder in the path: D:\Anritsu\MG3710A as well, because some data may be stored there.

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/MG3740A are stored, to the factory shipment status.

Restore entire hard disk
This function restores C Drive to the factory shipment status. For Windows 7 Professional or Windows Embedded Standard 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 Windows 7 Professional or Windows Embedded Standard 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/MG3740A will restart automatically then normal startup will be executed.

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/MG3740A are stored, to the factory shipment status.

Type: Disk
This function restores C Drive to the factory shipment status. For Windows 7 Professional or Windows Embedded Standard 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 Windows 7 Professional or Windows Embedded Standard 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/MG3740A, or click **Power off** to turn the power Off.
9.7 Setting Windows

9.7.7 Windows Security Measures


To apply security measures described in this section, the MG3710A/MG3740A must run WES7.

When using WES2009 or Win7, upgrade the CPU and operating system (with MG3710A-181/MG3740A-181), and the operating system can be updated to WES7.

In terms of security measures and antivirus, we do not recommend connecting the MG3710A/MG3740A running WES2009 or Win7 to a network.

“C1” label is affixed on the rear panel of the MG3710A/MG3740A that runs on WES7.

When connecting the MG3710A/MG3740A with WES7 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

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 desktop.
2. Click Start → Control Panel from the Windows menu bar hidden in the lower part of the screen.
3. Click System and Security → Action Center.
4. Click Security, and confirm security measures settings condition.

Note:

Security warnings are not displayed by factory default.

---

CAUTION

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.
Chapter 9  Other Functions

9.7.7.1 Activating Firewall

It is recommended to turn On the Windows firewall on this equipment.

Windows firewall On/Off setting:
1. Use the mouse to right-click anywhere on the screen, and click **Show the desktop** to reveal the desktop.
2. Click **Start → Control Panel** from the Windows menu bar hidden in the lower part of the screen.
3. Click **System and Security → Windows Firewall** to show Windows Firewall display.

*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 display.

5. Customize Settings display 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
Confirmation and setting of allowed programs through Windows firewall:

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 display.
2. Allowed Programs display 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 display](image1)

**Figure 9.7.1.4  Allowed Programs display**

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**.

![Allowed Programs display](image2)

**Figure 9.7.1.5  Allowed Programs display**
Procedure to add SignalGenerator when it is not registered:

1. Use the mouse to click Allow another program... found in Allowed Programs display.

2. Click Browse... to show Browse display of Add a Program.

Figure 9.7.7.1-6 Allowed Programs display

Figure 9.7.7.1-7 Add a Program display
Chapter 9  Other Functions

3. Browse display of Add a Program is shown. Select C:\Anritsu\MG3710A\Program Files\SignalGenerator.exe, and click Open.

![Browse display of Add a Program](image)

**Figure 9.7.7.1-8**  Browse display of Add a Program

4. In Add a Program display, select SignalGenerator, and click Add.

![Add a Program display](image)

**Figure 9.7.7.1-9**  Add a Program display
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 display](image-url)
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.

**Windows Update setting and execution:**
1. Use the mouse to right-click anywhere on the screen, and click *Show the desktop* to reveal the desktop.
2. Click **Start → Control Panel** from the Windows menu bar hidden in the lower part of the screen.
3. Click **System and Security → Windows Update** to show Windows Update display.
4. To deactivate automatic updates, click **Change settings** found in left side of Windows Update display.

![Figure 9.7.7.2-1 Windows Update display](image)
5. Select **Never check for updates (not recommended)** in Important updates, then click **OK**.

![Figure 9.7.7.2-2  Change settings display](image)

6. To check for newly available update programs (manual update), click **Check for updates** in Windows Update display.

![Figure 9.7.7.2-3  Windows Update display (manual update)](image)

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.
This chapter describes measurement devices, setup methods, configuration procedures, and performance test procedures required for performing performance tests as preventive maintenance.

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</tr>
</tbody>
</table>
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.

---

CAUTION

When the performance tests are performed, warm up the MG3710A/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 Overview of Performance Test

10.1.2 MG3710A/MG3740A performance test items and instruments used

The MG3710A/MG3740A performance test items and instruments to be used for each item are described in Table 10.1.2-1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Summary</th>
<th>Main Instrument (Anritsu Model Name)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Frequency</td>
<td>Counter (MF2412C)</td>
</tr>
<tr>
<td></td>
<td>The frequency is set and the output frequency is measured.</td>
<td></td>
</tr>
<tr>
<td>Output level</td>
<td>Output level frequency characteristics</td>
<td>Power Meter (ML2437A)</td>
</tr>
<tr>
<td></td>
<td>The absolute accuracy (frequency characteristics) is measured by using a power meter.</td>
<td>Power Sensor (MA24002A)</td>
</tr>
<tr>
<td>Vector modulation</td>
<td>Vector accuracy</td>
<td>Signal Analyzer (MS2690A/91A/92A)</td>
</tr>
<tr>
<td></td>
<td>A modulated pattern signal is generated through internal modulation and the vector accuracy is measured by using a Signal Analyzer.</td>
<td>W-CDMA/HSPA Downlink Measurement Software (MX269011A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSM/EDGE Measurement Software (MX269013A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LTE Downlink Measurement Software (MX269020A)</td>
</tr>
</tbody>
</table>

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/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/MG3740A-032/062/162 is installed)
- 9 kHz to 4000 MHz (when MG3710A/MG3740A-034/064/164 is installed)
- 9 kHz to 6000 MHz (when MG3710A/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/MG3740A.

1. Connect the reference signal output (10 MHz) of the frequency counter to the external reference input (REF Input) of the MG3710A/MG3740A for frequency synchronization.

2. Press to preset the MG3710A/MG3740A.

3. Set the output level of the MG3710A/MG3740A to 0 dBm and turn On the 1st RF Output.
4. Set the output frequency of the MG3710A/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 MΩ 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 Input > 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/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.
### Table 10.2.1-1  Frequency Setting Table

<table>
<thead>
<tr>
<th>x</th>
<th>FR (x) (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.009</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>600</td>
</tr>
<tr>
<td>5</td>
<td>1000</td>
</tr>
<tr>
<td>6</td>
<td>1500</td>
</tr>
<tr>
<td>7</td>
<td>2000</td>
</tr>
<tr>
<td>8</td>
<td>2500</td>
</tr>
<tr>
<td>9</td>
<td>2700</td>
</tr>
<tr>
<td>10</td>
<td>3000</td>
</tr>
<tr>
<td>11</td>
<td>3500</td>
</tr>
<tr>
<td>12</td>
<td>4000</td>
</tr>
<tr>
<td>13</td>
<td>4500</td>
</tr>
<tr>
<td>14</td>
<td>5000</td>
</tr>
<tr>
<td>15</td>
<td>5500</td>
</tr>
<tr>
<td>16</td>
<td>6000</td>
</tr>
</tbody>
</table>

X ≥ 10 are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed. X ≥ 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/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)

| Table 10.3.1-1 Test Standards |
| Composition | Output Level | Frequency |
| 50 MHz≤, <400 MHz | 400 MHz≤, ≤3 GHz | 3 GHz<, ≤4 GHz | 4 GHz<, ≤5 GHz | 5 GHz<, ≤6 GHz |
| 1st RF | −40 dBm<, <+2 dBm | ±0.5 dB | ±0.5 dB | ±0.7 dB | ±0.8 dB | ±0.8 dB |
| 2nd RF | −40 dBm<, <+2 dBm | ±0.5 dB | ±0.5 dB | ±0.7 dB | ±0.8 dB | ±0.8 dB |

For the 1st RF, when Option-043/143 is not installed.
For the 2nd RF, when Option-073/173 is not installed.

| Composition | Output Level | Frequency |
| 50 MHz≤, <400 MHz | 400 MHz≤, ≤3 GHz | 3 GHz<, ≤4 GHz | 4 GHz<, ≤5 GHz | 5 GHz<, ≤6 GHz |
| 1st RF | −40 dBm<, <-1 dBm | ±0.5 dB | ±0.5 dB | ±0.7 dB | ±0.8 dB | ±0.8 dB |
| 2nd RF | −40 dBm<, <-1 dBm | ±0.5 dB | ±0.5 dB | ±0.7 dB | ±0.8 dB | ±0.8 dB |

For the 1st RF, when Option-043/143 is installed.
For the 2nd RF, when Option-073/173 is installed.
Chapter 10  Performance Test

Measure the level according to Table 10.3.1-2 or Table 10.3.1-3.

Test procedure
1. Press on the MG3710A/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 ML2437A.
7. Perform the sensor calibration (zero point and sensitivity) for the ML2437A.
8. Turn On the 1st RF Output of the MG3710A/MG3740A.
9. Set the output level of the MG3710A/MG3740A to the value [LEV (1)] in Table 10.3.1-2 or Table 10.3.1-3.
10. Set frequencies of the MG3710A/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.
Table 10.3.1-2  Absolute Accuracy Measurement Frequency Setting

**Table 1**

<table>
<thead>
<tr>
<th>x</th>
<th>FR (x) (MHz)</th>
<th>LEV (x) (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>−5</td>
</tr>
<tr>
<td>2</td>
<td>97</td>
<td>−5</td>
</tr>
<tr>
<td>3</td>
<td>98</td>
<td>−7</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>−7</td>
</tr>
<tr>
<td>5</td>
<td>399</td>
<td>−7</td>
</tr>
<tr>
<td>6</td>
<td>400</td>
<td>−7</td>
</tr>
<tr>
<td>7</td>
<td>500</td>
<td>−7</td>
</tr>
<tr>
<td>8</td>
<td>1000</td>
<td>−7</td>
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<tr>
<td>9</td>
<td>1500</td>
<td>−7</td>
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<tr>
<td>10</td>
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<tr>
<td>11</td>
<td>2500</td>
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<tr>
<td>12</td>
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</tr>
<tr>
<td>13</td>
<td>3000</td>
<td>−7</td>
</tr>
<tr>
<td>14</td>
<td>3001</td>
<td>−7</td>
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<tr>
<td>15</td>
<td>3500</td>
<td>−7</td>
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<tr>
<td>16</td>
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<td>−7</td>
</tr>
<tr>
<td>17</td>
<td>4001</td>
<td>−7</td>
</tr>
<tr>
<td>18</td>
<td>4500</td>
<td>−7</td>
</tr>
<tr>
<td>19</td>
<td>5000</td>
<td>−7</td>
</tr>
<tr>
<td>20</td>
<td>5001</td>
<td>−7</td>
</tr>
<tr>
<td>21</td>
<td>5500</td>
<td>−7</td>
</tr>
<tr>
<td>22</td>
<td>6000</td>
<td>−7</td>
</tr>
</tbody>
</table>

X ≥ 13 are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed.

X ≥ 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.
### Table 10.3.1-3 Absolute Accuracy Measurement Frequency Setting

<table>
<thead>
<tr>
<th>x</th>
<th>FR (x) (MHz)</th>
<th>LEV (x) (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>-5</td>
</tr>
<tr>
<td>2</td>
<td>97</td>
<td>-5</td>
</tr>
<tr>
<td>3</td>
<td>98</td>
<td>-10</td>
</tr>
<tr>
<td>4</td>
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<td>15</td>
<td>3500</td>
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<td>16</td>
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<td>-10</td>
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<tr>
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<tr>
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<td>4500</td>
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<td>20</td>
<td>5001</td>
<td>-10</td>
</tr>
<tr>
<td>21</td>
<td>5500</td>
<td>-10</td>
</tr>
<tr>
<td>22</td>
<td>6000</td>
<td>-10</td>
</tr>
</tbody>
</table>

X ≥ 13 are available only when the Upper limit frequency 4 GHz and 6 GHz options are installed.

X ≥ 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. 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-043/143/073/173 is not installed

W-CDMA (Test Model 4)

Output level \(\leq +7 \text{ dBm} \) (When MG3710A-041/141/071/171 is not installed),
Output level \(\leq +13 \text{ dBm} \) (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 2200 MHz,
After CAL execution at 18 to 28ºC
\(\leq 0.62\% \) (rms) (0.6% (rms) typ.)

GSM

Output level \(\leq +7 \text{ dBm} \) (When MG3710A-041/141/071/171 is not installed),
Output level \(\leq +13 \text{ dBm} \) (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,
After CAL execution at 18 to 28ºC
\(\leq 0.84\° \) (rms) (0.8° (rms) typ.)

EDGE

Output level \(\leq +7 \text{ dBm} \) (When MG3710A-041/141/071/171 is not installed),
Output level \(\leq +13 \text{ dBm} \) (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,
After CAL execution at 18 to 28ºC
\(\leq 0.84\% \) (rms) (0.8% (rms) typ.)

LTE (20 MHz Test Model 3.1)
Output level $\leq +7$ dBm (When MG3710A-041/141/071/171 is not installed),
Output level $\leq +13$ dBm (When MG3710A-041/141/071/171 is installed),
Output frequency 600 to 2700 MHz,
After CAL execution at 18 to 28ºC
$\leq 0.82\%$ (rms) (0.8% (rms) typ.)
Output level $\leq +4$ dBm (When MG3710A-041/141/071/171 is not installed),
Output level $\leq +10$ dBm (When MG3710A-041/141/071/171 is installed),
Output frequency 3400 to 3800 MHz,
After CAL execution at 18 to 28ºC
$\leq 0.82\%$ (rms) (0.8% (rms) typ.)

When MG3710A-043/143/073/173 is installed

W-CDMA (Test Model 4)
Output level $\leq +4$ dBm (When MG3710A-041/141/071/171 is not installed),
Output level $\leq +10$ dBm (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 2200 MHz,
After CAL execution at 18 to 28ºC
$\leq 0.62\%$ (rms) (0.6% (rms) typ.)

GSM
Output level $\leq +4$ dBm (When MG3710A-041/141/071/171 is not installed),
Output level $\leq +10$ dBm (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,
After CAL execution at 18 to 28ºC
$\leq 0.84\%$ (rms) (0.8% (rms) typ.)

EDGE
Output level $\leq +4$ dBm (When MG3710A-041/141/071/171 is not installed),
Output level $\leq +10$ dBm (When MG3710A-041/141/071/171 is installed),
Output frequency: 800 to 900 MHz, 1800 to 1900 MHz,
After CAL execution at 18 to 28ºC
$\leq 0.84\%$ (rms) (0.8% (rms) typ.)
10.4 Vector Modulation Performance Test

LTE (20 MHz Test Model 3.1)
- Output level $\leq +4$ dBm (When MG3710A-041/141/071/171 is not installed),
- Output level $\leq +10$ dBm (When MG3710A-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-041/141/071/171 is not installed),
- Output level $\leq +7$ dBm (When MG3710A-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.)

Test procedure W-CDMA (Test Model 4)
1. Press \( \text{preset} \) of the MG3710A 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.
6. Turn On the vector modulation of the MG3710A to apply modulation with the TestModel_4 of standard waveform pattern.
7. Set the output level of the MG3710A and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
8. Set frequencies of the MG3710A 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 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.
10.4 Vector Modulation Performance Test

Test procedure GSM
1. Press \textit{Preset} of the MG3710A 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.
6. Turn On the vector modulation of the MG3710A to apply modulation with the NB_GMSK of standard waveform pattern.
7. Set the output level of the MG3710A and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
8. Set frequencies of the MG3710A 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 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 (EDGE)
1. Press \textit{Preset} of the MG3710A 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: 8PSK
   - Storage Mode: Average & Max
   - Average count: 10
5. Turn On the RF Output of the MG3710A.
6. Turn On the vector modulation of the MG3710A to apply modulation with the NB_8PSK of standard waveform pattern.
7. Set the output level of the MG3710A and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
8. Set frequencies of the MG3710A 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 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 of the MG3710A 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.
6. Turn On the vector modulation of the MG3710A to apply modulation with the E-TM_3-1_20M of standard waveform pattern.
7. Set the output level of the MG3710A and the input level of the MS2690A/91A/92A to the values in Table 10.4.1-1.
8. Set frequencies of the MG3710A 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 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.
### Table 10.4.1-1 Modulation Accuracy Measurement Level

<table>
<thead>
<tr>
<th>Composition</th>
<th>For the 1st RF, when Option-043/143 is not installed</th>
<th>For the 1st RF, when Option-043/143 is installed</th>
<th>For the 1st RF, when Option-041/141 is not installed</th>
<th>For the 1st RF, when Option-041/141 is installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the 2nd RF, when Option-073/173 is not installed</td>
<td>W-CDMA: +7 dBm GSM:+7 dBm EDGE:+7 dBm LTE:+7 dBm (600 to 2700 MHz) LTE:+4 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +4 dBm GSM:+4 dBm EDGE:+4 dBm LTE:+4 dBm (600 to 2700 MHz) LTE:+1 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +13 dBm GSM:+13 dBm EDGE:+13 dBm LTE:+13 dBm (600 to 2700 MHz) LTE:+10 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +10 dBm GSM:+10 dBm EDGE:+10 dBm LTE:+10 dBm (600 to 2700 MHz) LTE:+7 dBm (3400 to 3800 MHz)</td>
</tr>
<tr>
<td>For the 2nd RF, when Option-071/171 is not installed</td>
<td>W-CDMA: +7 dBm GSM:+7 dBm EDGE:+7 dBm LTE:+7 dBm (600 to 2700 MHz) LTE:+4 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +4 dBm GSM:+4 dBm EDGE:+4 dBm LTE:+4 dBm (600 to 2700 MHz) LTE:+1 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +13 dBm GSM:+13 dBm EDGE:+13 dBm LTE:+13 dBm (600 to 2700 MHz) LTE:+10 dBm (3400 to 3800 MHz)</td>
<td>W-CDMA: +10 dBm GSM:+10 dBm EDGE:+10 dBm LTE:+10 dBm (600 to 2700 MHz) LTE:+7 dBm (3400 to 3800 MHz)</td>
</tr>
</tbody>
</table>

### Table 10.4.1-2 W-CDMA Test Model 4 Modulation Accuracy Measurement Frequency Table

<table>
<thead>
<tr>
<th>x</th>
<th>FR (x) (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>800</td>
</tr>
<tr>
<td>2</td>
<td>900</td>
</tr>
<tr>
<td>3</td>
<td>1800</td>
</tr>
<tr>
<td>4</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>2200</td>
</tr>
</tbody>
</table>
Table 10.4.1-3  GSM Modulation Accuracy Measurement Frequency Table

<table>
<thead>
<tr>
<th>x</th>
<th>FR(x) (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>800</td>
</tr>
<tr>
<td>2</td>
<td>900</td>
</tr>
<tr>
<td>3</td>
<td>1800</td>
</tr>
<tr>
<td>4</td>
<td>1900</td>
</tr>
</tbody>
</table>

Table 10.4.1-4  EDGE Modulation Accuracy Measurement Frequency Table

<table>
<thead>
<tr>
<th>x</th>
<th>FR(x) (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>800</td>
</tr>
<tr>
<td>2</td>
<td>900</td>
</tr>
<tr>
<td>3</td>
<td>1800</td>
</tr>
<tr>
<td>4</td>
<td>1900</td>
</tr>
</tbody>
</table>

Table 10.4.1-5  LTE (20 MHz Test Model 3.1) Modulation Accuracy Measurement Frequency Table

<table>
<thead>
<tr>
<th>x</th>
<th>FR(x) (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>600</td>
</tr>
<tr>
<td>2</td>
<td>800</td>
</tr>
<tr>
<td>3</td>
<td>1500</td>
</tr>
<tr>
<td>4</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>2400</td>
</tr>
<tr>
<td>6</td>
<td>2700</td>
</tr>
<tr>
<td>7</td>
<td>3400</td>
</tr>
<tr>
<td>8</td>
<td>3500</td>
</tr>
<tr>
<td>9</td>
<td>3600</td>
</tr>
<tr>
<td>10</td>
<td>3700</td>
</tr>
<tr>
<td>11</td>
<td>3800</td>
</tr>
</tbody>
</table>
Chapter 11  Maintenance

This chapter describes cautions related to daily maintenance, storage, and shipping of the MG3710A/MG3740A, as well as the calibration procedure to be used as preventive maintenance.

11.1  Daily Maintenance and Storage ............................... 11-2
   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 ......................... 11-3
11.2  Repacking and Transportation upon Return .......... 11-4
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   11.4.1  Calibration ............................................. 11-6
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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/MG3740A has been used in a dusty place, or before long-term storage, wipe the MG3710A/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/MG3740A. Put the power cable, DVD-R and other accessories in the accessory box and store with the MG3710A/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
11.1 Daily Maintenance and Storage

Recommended storage conditions
For long-term storage, it is recommended that the MG3710A/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/MG3740A are explained.

11.2.1 Repacking

Repacking

Repack the MG3710A/MG3740A using the packing material (box) in which the MG3710A/MG3740A had been packed first. If the packing material has been discarded or damaged, repack the MG3710A/MG3740A with the method below:

1. Pack the MG3710A/MG3740A with vinyl or others.
2. Prepare a cardboard box, wooden box, or aluminum box which is large enough for the MG3710A/MG3740A and buffer material to surround the MG3710A/MG3740A to be put in the box.
3. Put the MG3710A/MG3740A in the box. Place the buffer material around the MG3710A/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/MG3740A after the recommended storage conditions are satisfied and avoiding vibration as much as possible.
11.3 Disposal

When the MG3710A/MG3740A is to be discarded, comply with regulations of each country and local government. Before discarding the MG3710A/MG3740A, dismantle or physically destroy any memory media it contains to ensure that any data saved in memory cannot be recovered by third parties.
Chapter 11  Maintenance

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/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.

---

**CAUTION**

When the calibration is performed, warm up the MG3710A/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 ±5°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/MG3740A are described in the table below.

<table>
<thead>
<tr>
<th>Recommended Device</th>
<th>Required Performance</th>
<th>Calibration Item</th>
</tr>
</thead>
</table>
| 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: $1 \times 10^{-11}$ order or more) | Reference oscillator frequency accuracy |
11.4 Calibration

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.

<table>
<thead>
<tr>
<th>Reference Oscillator</th>
<th>Aging Rate</th>
<th>Temperature Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal reference oscillator</td>
<td>$\pm 1 \times 10^{-6}$/year</td>
<td>$\pm 2.5 \times 10^{-6}$ (5 to 45°C)</td>
</tr>
<tr>
<td>High stability reference oscillator (Option 002/102 installed)</td>
<td>$\pm 1 \times 10^{-7}$/year</td>
<td>$\pm 2 \times 10^{-8}$ (5 to 45°C)</td>
</tr>
<tr>
<td>Rubidium reference oscillator (Option 001/101 installed)</td>
<td>$\pm 1 \times 10^{-10}$/month</td>
<td>$\pm 2 \times 10^{-9}$ (5 to 45°C)</td>
</tr>
</tbody>
</table>

Calibration procedure

The frequency calibration procedure with an oscilloscope is described.
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/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](image)

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/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/MG3740A must be adjusted.
6. 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/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/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.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannot be powered on.</td>
<td>The power cord is disconnected. The plug is not securely connected to the inlet.</td>
<td>Connect the power cord correctly.</td>
</tr>
<tr>
<td></td>
<td>The power switch is not pressed securely.</td>
<td>Hold down the power switch for three seconds or more.</td>
</tr>
<tr>
<td>The initialization screen is not finished even when ten minutes or more have passed after the power on.</td>
<td>The command to set the screen display to Off has been sent with the remote control.</td>
<td>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.</td>
</tr>
<tr>
<td>Nothing is displayed on the screen.</td>
<td></td>
<td>Send the command to set the screen display to On.</td>
</tr>
<tr>
<td>Parameters cannot be set.</td>
<td>Knob Hold has been set.</td>
<td>Press [ \text{Knob Hold} ] on the screen to cancel Knob Hold.</td>
</tr>
<tr>
<td></td>
<td>The remote control mode has been enabled.</td>
<td>Press [ \text{Local} ] to switch to the local control mode.</td>
</tr>
<tr>
<td></td>
<td>The parameter stands out of the specified range.</td>
<td>Set the parameter with the value within the specified range.</td>
</tr>
<tr>
<td></td>
<td>The setting condition is not met.</td>
<td>Check the parameter setting condition.</td>
</tr>
<tr>
<td>The function menu cannot be found.</td>
<td>It is displayed on another menu page.</td>
<td>Press [ \text{Page} ] to switch the page.</td>
</tr>
<tr>
<td>The displayed mode is different.</td>
<td>Switch to the mode which displays the menu to be set.</td>
<td></td>
</tr>
<tr>
<td>When the parameter is to be set, “Out of Range” is displayed.</td>
<td>The parameter stands out of the specified range.</td>
<td>Set the parameter with the value within the specified range.</td>
</tr>
</tbody>
</table>
### Table 11.6-1 Troubleshooting (Cont’d)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The remote control mode is not enabled with GPIB.</td>
<td>Remote control has been executed with Ethernet.</td>
<td>Disconnect Ethernet, press \text{Local} to switch to the local control mode, and then execute the connection with GPIB again.</td>
</tr>
<tr>
<td></td>
<td>GPIB address is wrong.</td>
<td>Set the same GPIB address to the interface setup screen and the controller side.</td>
</tr>
<tr>
<td></td>
<td>The GPIB cable is not connected correctly.</td>
<td>Connect the cable correctly based on the GPIB network condition.</td>
</tr>
<tr>
<td></td>
<td>The GPIB board setup on the PC is not correct.</td>
<td>Refer to the GPIB board operation manual you use.</td>
</tr>
<tr>
<td>The remote control mode is not enabled with Ethernet.</td>
<td>Remote control has been executed with GPIB.</td>
<td>Disconnect GIPB, press \text{Local} to switch to the local control mode, and then execute the connection with Ethernet again.</td>
</tr>
<tr>
<td></td>
<td>The port number is wrong.</td>
<td>Set the same port number to the interface setup screen and the PC.</td>
</tr>
<tr>
<td></td>
<td>The LAN cable type you use is wrong.</td>
<td>Select the cable correctly according to the connection method. Refer to “E.2.2 Connection by Ethernet”.</td>
</tr>
<tr>
<td></td>
<td>The LAN cable is not connected correctly.</td>
<td>Connect the cable correctly based on the Ethernet network condition.</td>
</tr>
<tr>
<td></td>
<td>The LAN board setup on the PC is not correct.</td>
<td>Refer to the LAN board operation manual you use.</td>
</tr>
<tr>
<td>The connection to IQproducer™ by LAN is unavailable.</td>
<td>IP address is wrong.</td>
<td>Set the same IP address to the interface setup screen and the IQproducer™ side.</td>
</tr>
<tr>
<td></td>
<td>The User ID or password is wrong.</td>
<td>Set the same user ID/password to the interface setup screen and the IQproducer™ side.</td>
</tr>
<tr>
<td>A waveform pattern is not displayed on the Waveform List to Play list in Baseband Mode.</td>
<td>The waveform pattern has not been loaded to the memory.</td>
<td>Load the waveform pattern to the memory. Refer to 7.3.4 “Loading waveform pattern: Load”.</td>
</tr>
<tr>
<td>A waveform pattern cannot be loaded to the memory.</td>
<td>The license key has not been installed.</td>
<td>Install the license key which corresponds to each pattern. Refer to 9.4.4 “Install”.</td>
</tr>
<tr>
<td>A signal is not output from the RF output.</td>
<td>The RF output is Off.</td>
<td>Press \text{On} to switch the RF output to On.</td>
</tr>
<tr>
<td>A modulated signal is not output from the RF output.</td>
<td>The modulation is Off.</td>
<td>Press \text{On} to switch the RF output modulation to On.</td>
</tr>
</tbody>
</table>
### Table 11.6-1  Troubleshooting (Cont’d)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A modulated signal is not output from the I/Q output.</td>
<td>I/Q output is Off.</td>
<td>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”.</td>
</tr>
<tr>
<td>The BER measurement does not operate normally.</td>
<td>The connected connector is wrong.</td>
<td>Connect to the correct connector according to the type of the signal to be input.</td>
</tr>
<tr>
<td>UNLOCK is displayed.</td>
<td>When Ref Source is Auto</td>
<td>Check if the reference signal input externally is correct.</td>
</tr>
<tr>
<td>When Baseband Clock Source is Ext</td>
<td>Check if the Baseband Clock signal input externally is correct.</td>
<td></td>
</tr>
<tr>
<td>Cases other than the above</td>
<td>The MG3710A/MG3740A may be broken. Contact an Anritsu Service and Sales office.</td>
<td></td>
</tr>
<tr>
<td>NG is displayed to [0] REF with Alarm History.</td>
<td>Failure in circuit</td>
<td>The MG3710A/MG3740A may be broken. Contact an Anritsu Service and Sales office.</td>
</tr>
<tr>
<td>ALC is displayed. NG is displayed to [2] ALC with Alarm History.</td>
<td>When using the MG3710A/MG3740A beyond the range of the product specification (output level accuracy)</td>
<td>The output level may not have reached the specified value. Change the setting so that the specified output level accuracy can be obtained.</td>
</tr>
<tr>
<td>When using the MG3710A/MG3740A within the range of the product specification (output level accuracy)</td>
<td>The MG3710A/MG3740A may be broken. Contact an Anritsu Service and Sales office.</td>
<td></td>
</tr>
<tr>
<td>NG is displayed to [3] BB with Alarm History.</td>
<td>Failure in circuit</td>
<td>The MG3710A/MG3740A may be broken. Contact an Anritsu Service and Sales office.</td>
</tr>
<tr>
<td>NG is displayed to [4] RPP with Alarm History.</td>
<td>High-level RF signal has been input to the RF Output terminal externally.</td>
<td>Check for the output level of connected devices, cable disconnection, short, and impedance inconsistency. Refer to 3.3.10 “RPP”.</td>
</tr>
<tr>
<td>BBDAC is displayed.</td>
<td>Clipping by over flow has occurred with Baseband DAC or digital block.</td>
<td>Lower the RMS Value Tuning setting.</td>
</tr>
<tr>
<td>EXTMOD is displayed.</td>
<td>The level of signal input to the External Modulation Input connector is greater than 2.03 Vp-p.</td>
<td>Decrease the level of signal input to the External Modulation Input connector to 2 Vp-p or less.</td>
</tr>
<tr>
<td>The level of signal input to the External Modulation Input connector is not greater than 2.03 Vp-p.</td>
<td>The MG3710A/MG3740A may be broken. Contact an Anritsu Service and Sales office.</td>
<td></td>
</tr>
</tbody>
</table>
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 and MG3740A, if not specified.

<Conditions>

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Measurement at a constant ambient temperature, after a warm up of 30 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common to CW mode and modulation mode</td>
<td>Pulse modulation Off</td>
</tr>
<tr>
<td></td>
<td>ATT Hold : Off</td>
</tr>
<tr>
<td></td>
<td>Optimize S/N Mode: Off</td>
</tr>
<tr>
<td></td>
<td>In the frequency range over 2.7 GHz, this condition is applied only when MG3710A/MG3740A-034/036 (or 064/066/164/166 for 2nd SG) is installed.</td>
</tr>
<tr>
<td></td>
<td>At frequencies over 4 GHz, this condition applies only when the MG3710A/MG3740A-036 (2nd SG is 066/166) is installed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Assuming that the RMS value of the waveform pattern is RMSw [linear value], the following must be met:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only in modulation mode</td>
<td>−3.00 dB ≤ RMSnom ≤ +3.00 dB</td>
</tr>
<tr>
<td></td>
<td>Exceptions: RMSnom=20•log (RMSw/4628) (when specified in 16 bit data)</td>
</tr>
<tr>
<td></td>
<td>RMSnom=20•log (RMSw/2314) (when specified in 15 bit data)</td>
</tr>
<tr>
<td></td>
<td>RMSnom=20•log (RMSw/1157) (when specified in 14 bit data)</td>
</tr>
<tr>
<td></td>
<td>After CAL execution</td>
</tr>
<tr>
<td></td>
<td>All the above are also applied to 2nd SG</td>
</tr>
<tr>
<td></td>
<td>(MG3710A/MG3740A-062/064/066/162/164/166).</td>
</tr>
</tbody>
</table>
## Appendix A Specifications

### <Frequency>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td></td>
</tr>
<tr>
<td>1st SG</td>
<td>9 kHz to 2.7 GHz (MG3710A/MG3740A-032)</td>
</tr>
<tr>
<td></td>
<td>9 kHz to 4 GHz (MG3710A/MG3740A-034)</td>
</tr>
<tr>
<td></td>
<td>9 kHz to 6 GHz (MG3710A/MG3740A-036)</td>
</tr>
<tr>
<td>2nd SG</td>
<td>9 kHz to 2.7 GHz (MG3710A/MG3740A-062/162)</td>
</tr>
<tr>
<td></td>
<td>9 kHz to 4 GHz (MG3710A/MG3740A-064/164)</td>
</tr>
<tr>
<td></td>
<td>9 kHz to 6 GHz (MG3710A/MG3740A-066/166)</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.01 Hz</td>
</tr>
<tr>
<td><strong>Phase adjustment</strong></td>
<td></td>
</tr>
<tr>
<td>Setting range</td>
<td>–180.00 deg to 180.00 deg</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 deg</td>
</tr>
<tr>
<td><strong>Frequency switching</strong></td>
<td>Under the condition of frequency &gt; 187.5 MHz, Phase Noise Optimize: Offset &lt; 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/MG3740A-041/141 or MG3710A/MG3740A-071/171 not installed and output level ≤ +7 dBm: ≤ 600 μs</td>
</tr>
<tr>
<td><strong>Internal reference oscillator</strong></td>
<td>When MG3710A/MG3740A-001/101/002/102 is not installed: ±1 × 10⁻⁶ /year ±2.5 × 10⁻⁶ (5 to 45ºC)</td>
</tr>
<tr>
<td>Aging rate</td>
<td></td>
</tr>
<tr>
<td>Temperature stability</td>
<td></td>
</tr>
<tr>
<td>Aging rate</td>
<td>±1 × 10⁻¹⁰/month</td>
</tr>
<tr>
<td>Temperature stability</td>
<td>±2 × 10⁻⁹ (5 to 45ºC)</td>
</tr>
<tr>
<td><strong>Activation characteristics</strong></td>
<td>Based on frequency 24 hours after power application, at 23ºC ±1 × 10⁻⁹ (7.5 minutes after power application)</td>
</tr>
<tr>
<td>When MG3710A/MG3740A-001/101 is installed:</td>
<td></td>
</tr>
<tr>
<td>Aging rate</td>
<td>±1 × 10⁻⁷ /year</td>
</tr>
<tr>
<td>Temperature stability</td>
<td>±2 × 10⁻⁸ (5 to 45ºC)</td>
</tr>
<tr>
<td>Activation characteristics</td>
<td>Based on frequency 24 hours after power application, at 23ºC ±5 × 10⁻⁷ (2 minutes after power application) ±5 × 10⁻⁸ (5 minutes after power application)</td>
</tr>
</tbody>
</table>
**<Output level>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting range</td>
<td>1st SG: MG3710A/MG3740A-043/143 not installed, 2nd SG: MG3710A/MG3740A-073/173 not installed</td>
</tr>
<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-041/141 not installed, 042/142 not installed, 2nd SG: MG3710A/MG3740A-071/171 not installed, 072/172 not installed, –110 dBm to +17 dBm</td>
</tr>
<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-041/141 installed, 042/142 not installed, 2nd SG: MG3710A/MG3740A-071/171 installed, 072/172 not installed, –110 dBm to +30 dBm</td>
</tr>
<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-041/141 not installed, 042/142 installed, 2nd SG: MG3710A/MG3740A-071/171 not installed, 072/172 installed, –144 dBm to +17 dBm</td>
</tr>
<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-041/141 installed, 042/142 installed, 2nd SG: MG3710A/MG3740A-071/171 installed, 072/172 installed, –144 dBm to +30 dBm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Unit</td>
<td>dBm</td>
</tr>
<tr>
<td>Unit of electrical</td>
<td>dBµV (terminal voltage display) and dBµVemf (open voltage display)</td>
</tr>
<tr>
<td>power</td>
<td></td>
</tr>
<tr>
<td>Unit of voltage</td>
<td></td>
</tr>
<tr>
<td>Level switching time</td>
<td>Under the condition of frequency &gt; 187.5 MHz, within the specification range of output level accuracy. However, output level ≤ +7 dBm when MG3710A/MG3740A-041/141 or MG3710A/MG3740A-071/171 not installed, ≤600 µs. 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</td>
</tr>
</tbody>
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### Appendix A  Specifications

<Output level> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
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<tbody>
<tr>
<td>Accuracy</td>
<td>CW, at 18 to 28°C</td>
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<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-043/143 not installed,</td>
</tr>
<tr>
<td></td>
<td>2nd SG: MG3710A/MG3740A-073/173 not installed</td>
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<tr>
<td></td>
<td>1st SG: MG3710A/MG3740A-041/141/042/142 not installed,</td>
</tr>
<tr>
<td></td>
<td>2nd SG: MG3710A/MG3740A-071/171/072/172 not installed</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-100 \text{ dBm}&lt;, \leq+5 \text{ dBm}$</td>
<td>$100 \text{ kHz} \leq, &lt;1 \text{ MHz}$</td>
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</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$+5 \text{ dBm}&lt;, \leq+10 \text{ dBm}$</td>
<td>$1 \text{ MHz} \leq, &lt;10 \text{ MHz}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq+5 \text{ dBm}$</td>
<td>$10 \text{ MHz} \leq, &lt;50 \text{ MHz}$</td>
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</table>

<table>
<thead>
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<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$+1 \text{ dBm}&lt;, \leq+13 \text{ dBm}$</td>
<td>$50 \text{ MHz} \leq, &lt;400 \text{ MHz}$</td>
</tr>
<tr>
<td>$-40 \text{ dBm}&lt;, \leq+1 \text{ dBm}$</td>
<td>$400 \text{ MHz} \leq, &lt;3 \text{ GHz}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq-40 \text{ dBm}$</td>
<td>$3 \text{ GHz} \leq, &lt;4 \text{ GHz}$</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$+11 \text{ dBm}&lt;, \leq+13 \text{ dBm}$</td>
<td>$3 \text{ GHz} \leq, &lt;4 \text{ GHz}$</td>
</tr>
<tr>
<td>$+1 \text{ dBm}&lt;, \leq+11 \text{ dBm}$</td>
<td>$4 \text{ GHz} \leq, &lt;5 \text{ GHz}$</td>
</tr>
<tr>
<td>$-40 \text{ dBm}&lt;, \leq+1 \text{ dBm}$</td>
<td>$5 \text{ GHz} \leq, &lt;6 \text{ GHz}$</td>
</tr>
<tr>
<td>$-100 \text{ dBm}&lt;, \leq-40 \text{ dBm}$</td>
<td>$-100 \text{ dBm}&lt;, \leq-100 \text{ dBm}$</td>
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### Output level Cont'd

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<thead>
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<th>Items</th>
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<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>$-100 \text{ dBm}&lt;, \leq +5 \text{ dBm}$</td>
<td>$100 \text{ kHz} \leq, &lt;1 \text{ MHz}$</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 \text{ MHz} \leq, &lt;10 \text{ MHz}$</td>
<td>$10 \text{ MHz} \leq, &lt;50 \text{ MHz}$</td>
</tr>
<tr>
<td>$+5 \text{ dBm}&lt;, \leq +10 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB typ.}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq +5 \text{ dBm}$</td>
<td>$\pm 0.5 \text{ dB typ.}$</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>$50 \text{ MHz} \leq, &lt;400 \text{ MHz}$</td>
<td>$400 \text{ MHz} \leq, \leq 3 \text{ GHz}$</td>
</tr>
<tr>
<td>$+20 \text{ dBm}&lt;, \leq +23 \text{ dBm}$</td>
<td>$\pm 0.6 \text{ dB}$</td>
</tr>
<tr>
<td>$+13 \text{ dBm}&lt;, \leq +20 \text{ dBm}$</td>
<td>$\pm 0.6 \text{ dB}$</td>
</tr>
<tr>
<td>$+1 \text{ dBm}&lt;, \leq +13 \text{ dBm}$</td>
<td>$\pm 0.5 \text{ dB}$</td>
</tr>
<tr>
<td>$-40 \text{ dBm}&lt;, \leq +1 \text{ dBm}$</td>
<td>$\pm 0.5 \text{ dB}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq +40 \text{ dBm}$</td>
<td>$\pm 0.5 \text{ dB}$</td>
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<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>$3 \text{ GHz} &lt;, \leq 4 \text{ GHz}$</td>
<td>$4 \text{ GHz} &lt;, \leq 5 \text{ GHz}$</td>
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<tr>
<td>$+13 \text{ dBm}&lt;, \leq +20 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
</tr>
<tr>
<td>$+11 \text{ dBm}&lt;, \leq +13 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
</tr>
<tr>
<td>$+1 \text{ dBm}&lt;, \leq +11 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
</tr>
<tr>
<td>$-40 \text{ dBm}&lt;, \leq +1 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
</tr>
<tr>
<td>$-100 \text{ dBm}&lt;, \leq +40 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq +100 \text{ dBm}$</td>
<td>$\pm 0.7 \text{ dB}$</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5 \text{ GHz} &lt;, \leq 6 \text{ GHz}$</td>
<td></td>
</tr>
<tr>
<td>$+1 \text{ dBm}&lt;, \leq +11 \text{ dBm}$</td>
<td>$\pm 0.8 \text{ dB}$</td>
</tr>
<tr>
<td>$-40 \text{ dBm}&lt;, \leq +1 \text{ dBm}$</td>
<td>$\pm 0.8 \text{ dB}$</td>
</tr>
<tr>
<td>$-100 \text{ dBm}&lt;, \leq +40 \text{ dBm}$</td>
<td>$\pm 0.8 \text{ dB}$</td>
</tr>
<tr>
<td>$-110 \text{ dBm}&lt;, \leq +100 \text{ dBm}$</td>
<td>$\pm 0.8 \text{ dB}$</td>
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### Specifications

#### <Output level> Cont’d

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<tr>
<th>Level</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>−100 dBm&lt;, ≤+5 dBm</td>
<td>100 kHz≤, &lt;1 MHz</td>
</tr>
<tr>
<td></td>
<td>±0.5 dB typ.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5 dBm&lt;, ≤+10 dBm</td>
<td>1 MHz≤, &lt;10 MHz</td>
</tr>
<tr>
<td>−120 dBm&lt;, ≤+5 dBm</td>
<td>10 MHz≤, &lt;50 MHz</td>
</tr>
<tr>
<td></td>
<td>±0.5 dB typ.</td>
</tr>
<tr>
<td></td>
<td>±0.5 dB typ.</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>+1 dBm≤, ≤+13 dBm</td>
<td>50 MHz≤, &lt;400 MHz</td>
</tr>
<tr>
<td>−40 dBm&lt;, ≤+1 dBm</td>
<td>400 MHz≤, ≤3 GHz</td>
</tr>
<tr>
<td>−110 dBm&lt;, ≤−40 dBm</td>
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<tr>
<td>−120 dBm&lt;, ≤−110 dBm</td>
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<tr>
<td>−127 dBm&lt;, ≤−120 dBm</td>
<td></td>
</tr>
<tr>
<td>−136 dBm&lt;, ≤−127 dBm</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>+11 dBm&lt;, ≤+13 dBm</td>
<td>3 GHz&lt;, ≤4 GHz</td>
</tr>
<tr>
<td>+1 dBm&lt;, ≤+11 dBm</td>
<td>4 GHz&lt;, ≤5 GHz</td>
</tr>
<tr>
<td>−40 dBm&lt;, ≤+1 dBm</td>
<td></td>
</tr>
<tr>
<td>−100 dBm&lt;, ≤−40 dBm</td>
<td></td>
</tr>
<tr>
<td>−110 dBm&lt;, ≤−100 dBm</td>
<td></td>
</tr>
<tr>
<td>−120 dBm&lt;, ≤−110 dBm</td>
<td></td>
</tr>
<tr>
<td>−127 dBm&lt;, ≤−120 dBm</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>+1 dBm&lt;, ≤+11 dBm</td>
<td>5 GHz&lt;, ≤6 GHz</td>
</tr>
<tr>
<td>−40 dBm&lt;, ≤+1 dBm</td>
<td></td>
</tr>
<tr>
<td>−100 dBm&lt;, ≤−40 dBm</td>
<td></td>
</tr>
<tr>
<td>−110 dBm&lt;, ≤−100 dBm</td>
<td></td>
</tr>
<tr>
<td>−120 dBm&lt;, ≤−110 dBm</td>
<td></td>
</tr>
<tr>
<td>−127 dBm&lt;, ≤−120 dBm</td>
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<Output level> Cont’d

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<th>Items</th>
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<tr>
<th>Level</th>
<th>Frequency</th>
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<tbody>
<tr>
<td></td>
<td>100 kHz≤, &lt;1 MHz</td>
<td>±0.5 dB typ.</td>
</tr>
<tr>
<td>-100 dBm&lt;, ≤+5 dBm</td>
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</tr>
<tr>
<td>+5 dBm&lt;, ≤+10 dBm</td>
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<td></td>
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<tr>
<td>-120 dBm&lt;, ≤+5 dBm</td>
<td>±0.5 dB typ.</td>
<td>±0.5 dB typ.</td>
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<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>50 MHz≤, &lt;400 MHz</td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>+20 dBm&lt;, ≤+23 dBm</td>
<td></td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>+13 dBm&lt;, ≤+20 dBm</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>+1 dBm&lt;, ≤+13 dBm</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-40 dBm&lt;, ≤+1 dBm</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-110 dBm&lt;, ≤-40 dBm</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-120 dBm&lt;, ≤-110 dBm</td>
<td>±0.5 dB</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-127 dBm&lt;, ≤-120 dBm</td>
<td>±0.7 dB</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-136 dBm&lt;, ≤-127 dBm</td>
<td>±1.5 dB typ.</td>
<td>±1.5 dB typ.</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 GHz≤, ≤4 GHz</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>+13 dBm&lt;, ≤+20 dBm</td>
<td></td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>+11 dBm&lt;, ≤+13 dBm</td>
<td>±0.7 dB</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>+1 dBm&lt;, ≤+11 dBm</td>
<td>±0.7 dB</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-40 dBm&lt;, ≤+1 dBm</td>
<td>±0.7 dB</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-100 dBm&lt;, ≤-40 dBm</td>
<td>±0.7 dB</td>
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<tr>
<td>-110 dBm&lt;, ≤-100 dBm</td>
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<tr>
<td>-120 dBm&lt;, ≤-110 dBm</td>
<td>±0.7 dB</td>
<td>±1.0 dB</td>
</tr>
<tr>
<td>-127 dBm&lt;, ≤-120 dBm</td>
<td>±2.5 dB typ.</td>
<td>±2.5 dB typ.</td>
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## Specifications

### Output level Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
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</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td></td>
<td>5 GHz&lt;, ≤6 GHz</td>
</tr>
<tr>
<td>+1 dBM≤, ≤+11 dBM</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-40 dBM&lt;, ≤+1 dBM</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-100 dBM&lt;, ≤-40 dBm</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-110 dBM&lt;, ≤-100 dBm</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-120 dBM&lt;, ≤-110 dBm</td>
<td>±1.0 dB</td>
</tr>
<tr>
<td>-127 dBM&lt;, ≤-120 dBm</td>
<td>±2.5 dB typ.</td>
</tr>
</tbody>
</table>

1st SG: MG3710A/MG3740A-043/143 installed,
2nd SG: MG3710A/MG3740A-073/173 installed

1st SG: MG3710A/MG3740A-041/141/042/142 not installed,
2nd SG: MG3710A/MG3740A-071/171/072/172 not installed

<table>
<thead>
<tr>
<th><strong>Level</strong></th>
<th><strong>Frequency</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-100 dBM&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Level</strong></th>
<th><strong>Frequency</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>+2 dBM&lt;, ≤+7 dBm</td>
<td>±0.7 dB typ.</td>
</tr>
<tr>
<td>-110 dBM&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th><strong>Level</strong></th>
<th><strong>Frequency</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-2 dBM≤, ≤+10 dBm</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-40 dBM&lt;, ≤-2 dBm</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-110 dBM&lt;, ≤-40 dBm</td>
<td>±0.5 dB</td>
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<thead>
<tr>
<th><strong>Level</strong></th>
<th><strong>Frequency</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>+8 dBM&lt;, ≤+10 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-2 dBM≤, ≤+8 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-40 dBM&lt;, ≤-2 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-100 dBM&lt;, ≤-40 dBm</td>
<td>±0.7 dB</td>
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<td>±0.8 dB</td>
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## Accuracy

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<thead>
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<td>-2 dBm&lt;, ≤+8 dBm</td>
<td>±0.8 dB</td>
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<td>-100 dBm&lt;, ≤-40 dBm</td>
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<tr>
<td>-110 dBm&lt;, ≤-100 dBm</td>
<td>±0.8 dB</td>
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<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>-100 dBm&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MHz&lt;, &lt;10 MHz</td>
<td>±0.7 dB typ.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>+2 dBm&lt;, ≤+7 dBm</td>
<td>±0.5 dB typ.</td>
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<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>-110 dBm&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ.</td>
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<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
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<td>±0.6 dB</td>
</tr>
<tr>
<td>+10 dBm&lt;, ≤+17 dBm</td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>-2 dBm&lt;, ≤+10 dBm</td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>-40 dBm&lt;, ≤-2 dBm</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-110 dBm&lt;, ≤-40 dBm</td>
<td>±0.5 dB</td>
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<table>
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<tr>
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<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>+10 dBm&lt;, ≤+17 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>+8 dBm&lt;, ≤+10 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-2 dBm&lt;, ≤+8 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-40 dBm&lt;, ≤-2 dBm</td>
<td>±0.7 dB</td>
</tr>
<tr>
<td>-100 dBm&lt;, ≤-40 dBm</td>
<td>±0.7 dB</td>
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<tr>
<td>-110 dBm&lt;, ≤-100 dBm</td>
<td>±0.7 dB</td>
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### Specifications

#### Output level

<table>
<thead>
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<th>Items</th>
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<tr>
<td>Accuracy</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>5 GHz&lt;, ≤6 GHz</td>
<td></td>
</tr>
<tr>
<td>-2 dBm≤, ≤+8 dBm</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-40 dBm&lt;, &lt;-2 dBm</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-100 dBm&lt;, ≤-40 dBm</td>
<td>±0.8 dB</td>
</tr>
<tr>
<td>-110 dBm&lt;, ≤-100 dBm</td>
<td>±0.8 dB</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>100 kHz≤, &lt;1 MHz</td>
<td>±0.5 dB typ.</td>
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<tr>
<td>-100 dBm&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ.</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>1 MHz≤, &lt;10 MHz</td>
<td>10 MHz≤, &lt;50 MHz</td>
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<tr>
<td>+2 dBm&lt;, ≤+7 dBm</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-120 dBm&lt;, ≤+2 dBm</td>
<td>±0.5 dB typ., ±0.5 dB typ.</td>
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<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>50 MHz≤, &lt;400 MHz</td>
<td>400 MHz≤, &lt;3 GHz</td>
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<td>-2 dBm≤, ≤+10 dBm</td>
<td>±0.5 dB</td>
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<tr>
<td>-40 dBm&lt;, &lt;-2 dBm</td>
<td>±0.5 dB</td>
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<tr>
<td>-110 dBm&lt;, ≤-40 dBm</td>
<td>±0.5 dB</td>
</tr>
<tr>
<td>-120 dBm&lt;, ≤-110 dBm</td>
<td>±0.7 dB</td>
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<tr>
<td>-127 dBm&lt;, ≤-120 dBm</td>
<td>±1.0 dB</td>
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<tr>
<td>-136 dBm&lt;, ≤-127 dBm</td>
<td>±1.5 dB typ., ±1.5 dB typ.</td>
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<tbody>
<tr>
<td>3 GHz&lt;, ≤4 GHz</td>
<td>4 GHz&lt;, ≤5 GHz</td>
</tr>
<tr>
<td>+8 dBm&lt;, ≤+10 dBm</td>
<td>±0.7 dB</td>
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<tr>
<td>-2 dBm≤, ≤+8 dBm</td>
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<tr>
<td>Level</td>
<td>Frequency</td>
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<td>–40 dBm&lt;, ≤–2 dBm</td>
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<td>–120 dBm&lt;, ≤–110 dBm</td>
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<tbody>
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<tbody>
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<td>±0.7 dB typ.</td>
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<tr>
<td>10 MHz≤, &lt;50 MHz</td>
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### Appendix A  Specifications

<Output level> Cont’d

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<td><strong>Accuracy</strong></td>
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<tr>
<td><strong>Level</strong></td>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td></td>
<td>50 MHz≤, &lt;400 MHz</td>
</tr>
<tr>
<td>+17 dBm, ≤+20 dBm</td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>+10 dBm, ≤+17 dBm</td>
<td>±0.6 dB</td>
</tr>
<tr>
<td>–2 dBm, ≤+10 dBm</td>
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<td>±1.5 dB typ.</td>
</tr>
</tbody>
</table>

| **Level** | **Frequency** |
| | 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, ≤–8 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. |

| **Level** | **Frequency** |
| | 5 GHz≤, ≤6 GHz |
| –2 dBm, ≤+8 dBm | ±0.8 dB |
| –40 dBm, ≤–8 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. |
## <Output level> Cont’d

<table>
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<th>Items</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>Linearity</td>
<td>CW, at 18 to 28°C</td>
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1st SG: MG3710A/MG3740A-043/143 not installed, 2nd SG: MG3710A/MG3740A-073/173 not installed


Reference: –7 dBm

<table>
<thead>
<tr>
<th>Level</th>
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</thead>
<tbody>
<tr>
<td>50 MHz ≤, &lt;400 MHz</td>
<td>400 MHz ≤, ≤3 GHz</td>
</tr>
<tr>
<td>–40 dBm &lt;, &lt;+1 dBm</td>
<td>±0.2 dB typ.</td>
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<tr>
<td>–110 dBm &lt;, ≤–40 dBm</td>
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### Appendix A  Specifications

<Output level> Cont'd

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<tr>
<td>Linearity</td>
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<th>Frequency</th>
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<th>400 MHz ≤, ≤3 GHz</th>
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<tbody>
<tr>
<td>−40 dBm&lt;, &lt;+1 dBm</td>
<td>±0.2 dB typ.</td>
<td>±0.2 dB typ.</td>
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<tr>
<td>−110 dBm&lt;, ≤−40 dBm</td>
<td>±0.2 dB typ.</td>
<td>±0.2 dB typ.</td>
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<tr>
<td>−120 dBm&lt;, ≤−110 dBm</td>
<td>±0.2 dB typ.</td>
<td>±0.2 dB typ.</td>
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<th>4 GHz&lt;, ≤6 GHz</th>
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</thead>
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<tr>
<td>−40 dBm&lt;, &lt;+1 dBm</td>
<td>±0.3 dB typ.</td>
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<tr>
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<td>±0.3 dB typ.</td>
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Reference: −7 dBm

<table>
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<th>Level</th>
<th>Frequency</th>
<th>50 MHz ≤, &lt;400 MHz</th>
<th>400 MHz ≤, ≤3 GHz</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>−100 dBm&lt;, ≤−40 dBm</td>
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<tbody>
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<td>50 MHz≤, &lt;400 MHz</td>
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<tr>
<td>–40 dBm&lt;, &lt;=-2 dBm</td>
<td>±0.2 dB typ.</td>
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<th>Level</th>
<th>Frequency</th>
<th>3 GHz&lt;, ≤4 GHz</th>
<th>4 GHz&lt;, ≤6 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>–40 dBm&lt;, &lt;–2 dBm</td>
<td>±0.3 dB typ.</td>
<td>±0.3 dB typ.</td>
<td></td>
</tr>
<tr>
<td>–100 dBm&lt;, ≤–40 dBm</td>
<td>±0.3 dB typ.</td>
<td>±0.3 dB typ.</td>
<td></td>
</tr>
<tr>
<td>–110 dBm&lt;, ≤–100 dBm</td>
<td>±0.4 dB typ.</td>
<td>±0.4 dB typ.</td>
<td></td>
</tr>
</tbody>
</table>
### <ATT Hold>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT Hold function</td>
<td>When ATT Hold is turned on, level adjustment of continuous signal generation is available. Setting Range: -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</td>
</tr>
</tbody>
</table>

### <Output connector>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>Front panel, RF Output, 2nd RF Output (Opt), N-J connector, 50 Ω</td>
</tr>
<tr>
<td>VSWR</td>
<td>1st SG: MG3710A/MG3740A-043/143 not installed, 2nd SG: MG3710A/MG3740A-073/173 not installed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>50 MHz ≤ 3 GHz</th>
<th>3 GHz &lt; 4 GHz</th>
<th>4 GHz &lt; 6 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤-7 dBm</td>
<td>≤1.45</td>
<td>≤1.65</td>
<td>≤1.9</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Level</th>
<th>50 MHz ≤ 3 GHz</th>
<th>3 GHz &lt; 4 GHz</th>
<th>4 GHz &lt; 6 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤-10 dBm</td>
<td>≤1.45</td>
<td>≤1.65</td>
<td>≤1.9</td>
</tr>
</tbody>
</table>

### <Maximum reverse input>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum reverse input</td>
<td>±50 V DC Max Common to 1st and 2nd SG</td>
</tr>
<tr>
<td>Maximum reverse input voltage</td>
<td>1st SG: MG3710A/MG3740A-043/143 not installed, 2nd SG: MG3710A/MG3740A-073/173 not installed</td>
</tr>
<tr>
<td>Maximum reverse input power</td>
<td>2 W (Nominal) 1st SG: MG3710A/MG3740A-043/143 installed, 2nd SG: MG3710A/MG3740A-073/173 installed</td>
</tr>
<tr>
<td></td>
<td>20 W (Nominal) (1 MHz &lt; Reverse input power frequency ≤ 1 GHz)</td>
</tr>
<tr>
<td></td>
<td>20 W (Nominal) (1 GHz &lt; Reverse input power frequency ≤ 2 GHz)</td>
</tr>
<tr>
<td></td>
<td>10 W (Nominal) (2 GHz &lt; Reverse input power frequency ≤ 6 GHz)</td>
</tr>
</tbody>
</table>
## Appendix A  Specifications

### <Signal purity>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmonic spurious</td>
<td>At CW, Optimize S/N = Off</td>
</tr>
</tbody>
</table>

1st SG: MG3710A/MG3740A-043/143 not installed, 
2nd SG: MG3710A/MG3740A-073/173 not installed

1st SG: MG3710A/MG3740A-041/141 not installed, 
2nd SG: MG3710A/MG3740A-071/171 not installed

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz ≤, 3 GHz</td>
<td>3 GHz&lt;</td>
</tr>
<tr>
<td>≤+4 dBm</td>
<td>≤30 dBc</td>
</tr>
</tbody>
</table>

1st SG: MG3710A/MG3740A-041/141 installed, 
2nd SG: MG3710A/MG3740A-071/171 installed

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz ≤, &lt;50 MHz</td>
<td>50 MHz ≤, 3 GHz</td>
</tr>
<tr>
<td>≤+4 dBm</td>
<td>≤30 dBc</td>
</tr>
</tbody>
</table>

CW, Optimize S/N = Off

1st SG: MG3710A/MG3740A-043/143 installed, 
2nd SG: MG3710A/MG3740A-073/173 installed

1st SG: MG3710A/MG3740A-041/141 not installed, 
2nd SG: MG3710A/MG3740A-071/171 not installed

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz ≤, 3 GHz</td>
<td>3 GHz&lt;</td>
</tr>
<tr>
<td>≤+1 dBm</td>
<td>≤30 dBc</td>
</tr>
</tbody>
</table>

1st SG: MG3710A/MG3740A-041/141 installed, 
2nd SG: MG3710A/MG3740A-071/171 installed

<table>
<thead>
<tr>
<th>Level</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz ≤, &lt;5 MHz</td>
<td>50 MHz ≤, 3 GHz</td>
</tr>
<tr>
<td>≤+1 dBm</td>
<td>≤30 dBc</td>
</tr>
</tbody>
</table>
### <Signal purity> Cont'd

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-harmonic spurious</td>
<td>Under the conditions of $-30 \text{ dBm} \leq \text{output level} \leq +5 \text{ dBm}$, CW generation, 10 kHz or more frequency offset from the output frequency.</td>
</tr>
<tr>
<td></td>
<td>$\leq -62 \text{ dBc} \ (-70 \text{ dBc typ.})$  \ (100 kHz $\leq \text{frequency} \leq 187.5 \text{ MHz}$)</td>
</tr>
<tr>
<td></td>
<td>$\leq -68 \text{ dBc} \ (-76 \text{ dBc typ.})$  \ (187.5 MHz $&lt; \text{frequency} \leq 750 \text{ MHz}$)</td>
</tr>
<tr>
<td></td>
<td>$\leq -62 \text{ dBc} \ (-76 \text{ dBc typ.})$  \ (750 MHz $&lt; \text{frequency} \leq 1.5 \text{ GHz}$)</td>
</tr>
<tr>
<td></td>
<td>$\leq -56 \text{ dBc} \ (-70 \text{ dBc typ.})$  \ (1.5 GHz $&lt; \text{frequency} \leq 3 \text{ GHz}$)</td>
</tr>
<tr>
<td></td>
<td>$\leq -50 \text{ dBc} \ (-64 \text{ dBc typ.})$  \ (3 GHz $&lt; \text{frequency} \leq 6 \text{ GHz}$)</td>
</tr>
<tr>
<td>SSB phase noise</td>
<td>At Phase Noise Opt.: $&lt;200 \text{ kHz}$, CW, 20 kHz offset.</td>
</tr>
<tr>
<td></td>
<td>$\leq -140 \text{ dBc/Hz} \ (\text{Nominal})$ \ (100 MHz)</td>
</tr>
<tr>
<td></td>
<td>$\leq -131 \text{ dBc/Hz typ.}$ \ (1 GHz)</td>
</tr>
<tr>
<td></td>
<td>$\leq -125 \text{ dBc/Hz typ.}$ \ (2 GHz)</td>
</tr>
</tbody>
</table>
## <Analog modulation/Pulse modulation>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| 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 (MG3710A)     | 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%.  
                                < (3% of the set value + 2%) (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 ≤ 90%.  
                                < (2% of the set value + 1%) (Nominal)                                                                                                    |
| AM Depth Error (MG3740A)     | 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 < 20%.  
                                < (2% of the set value + 1%) (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 20% ≤ modulation ratio m ≤ 90%.  
                                < (2% of the set value + 1%)                                                                                                             |
<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude Modulation (Cont’d)</td>
<td>Distortion (MG3710A)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 100 \text{ kHz} \leq \text{frequency range} &lt; 98 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 30% ). ( &lt; 2% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 100 \text{ kHz} \leq \text{frequency range} &lt; 98 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 90% ). ( &lt; 2.5% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 98 \text{ MHz} \leq \text{frequency range} \leq 2700 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 30% ). ( &lt; 0.5% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 98 \text{ MHz} \leq \text{frequency range} \leq 2700 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 90% ). ( &lt; 0.5% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Distortion (MG3740A)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 100 \text{ kHz} \leq \text{frequency range} &lt; 7 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 30% ). ( &lt; 2% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 100 \text{ kHz} \leq \text{frequency range} &lt; 7 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 90% ). ( &lt; 2.5% ) (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 7 \text{ MHz} \leq \text{frequency range} &lt; 98 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 30% ). ( &lt; 2% )</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 7 \text{ MHz} \leq \text{frequency range} &lt; 98 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 90% ). ( &lt; 2.5% )</td>
</tr>
<tr>
<td></td>
<td>Under the conditions: peak level ( \leq 4 \text{ dBm} ), ( 98 \text{ MHz} \leq \text{frequency range} \leq 2700 \text{ MHz} ), AM Depth Type = Lin, after CAL execution, modulation rate = 1 kHz, AM Source = Sine, and modulation ratio ( m = 30% ). ( &lt; 1% )</td>
</tr>
</tbody>
</table>
### <Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude Modulation</td>
<td></td>
</tr>
<tr>
<td>Distortion (Cont’d)</td>
<td>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 = 90%. &lt; 1%</td>
</tr>
<tr>
<td>Modulation Frequency Response (MG3710A)</td>
<td>Under the conditions: peak level ≤ 4 dBm, 100 kHz ≤ frequency range &lt; 98 MHz, AM Depth Type = Lin, modulation ratio m = 30%, after CAL execution, and bandwidth within ±1.5 dB. 0.1 Hz ≤ modulation rate ≤ 20 kHz (nominal) Under the conditions: peak level ≤ 4 dBm, 100 kHz ≤ frequency range &lt; 98 MHz, AM Depth Type = Lin, modulation ratio m = 90%, after CAL execution, and bandwidth within ±1.5 dB. 0.1 Hz ≤ modulation rate ≤ 20 kHz (nominal) Under the conditions: peak level ≤ 4 dBm, 98 MHz ≤ 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 ≤ 20 kHz (nominal) 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 Hz ≤ modulation rate ≤ 20 kHz (nominal)</td>
</tr>
</tbody>
</table>
### Analog modulation/Pulse modulation Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Amplitude Modulation (Cont’d)                                        | Under the conditions: peak level $\leq 4$ dBm, $100$ kHz $\leq$ frequency range $< 98$ MHz, AM Depth Type = Lin, modulation ratio $m = 30\%$, after CAL execution, and bandwidth within $\pm 1.5$ dB.  
  $0.1$ Hz $\leq$ modulation rate $\leq 20$ kHz (nominal) |
| Frequency Response (MG3740A)                                         | Under the conditions: peak level $\leq 4$ dBm, $100$ kHz $\leq$ frequency range $< 98$ MHz, AM Depth Type = Lin, modulation ratio $m = 90\%$, after CAL execution, and bandwidth within $\pm 1.5$ dB.  
  $0.1$ Hz $\leq$ modulation rate $\leq 20$ kHz (nominal) |
|                                                                       | Under the conditions: peak level $\leq 4$ dBm, $98$ MHz $\leq$ frequency range $\leq 2700$ MHz, AM Depth Type = Lin, modulation ratio $m = 30\%$, after CAL execution, and bandwidth within $\pm 1$ dB.  
  $0.1$ Hz $\leq$ modulation rate $< 50$ Hz (nominal)  
  $50$ Hz $\leq$ modulation rate $\leq 100$ kHz (typ.) |
|                                                                       | Under the conditions: peak level $\leq 4$ dBm, $98$ MHz $\leq$ frequency range $\leq 2700$ MHz, AM Depth Type = Lin, modulation ratio $m = 90\%$, after CAL execution, and bandwidth within $\pm 1$ dB.  
  $0.1$ Hz $\leq$ modulation rate $< 50$ Hz (nominal)  
  $50$ Hz $\leq$ modulation rate $\leq 100$ kHz (typ.) |
### Appendix A Specifications

**<Analog modulation/Pulse modulation> Cont’d**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Modulation</td>
<td>Available only for internal modulation. Specified only for the modulation onto CW. In MG3740A, Optimize Function is set to Distortion.</td>
</tr>
<tr>
<td>FM Deviation</td>
<td>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</td>
</tr>
<tr>
<td>Deviation Accuracy (MG3710A)</td>
<td>Under the conditions: 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 20 Hz ≤ deviation ≤ 40 kHz. &lt; (2% of the set value + 20 Hz) (Nominal)</td>
</tr>
<tr>
<td>Deviation Accuracy (MG3740A)</td>
<td>Under the conditions: 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 20 Hz ≤ deviation ≤ 200 Hz. &lt; (2% of the set value + 20 Hz) (Nominal)</td>
</tr>
</tbody>
</table>
### Frequency Modulation (Cont’d)

#### Deviation Accuracy (MG3740A)

Under the conditions:
- Output level ≤ 4 dBm,
- \(250 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} \leq 2700 \text{ MHz}\),
- After CAL execution, modulation rate = 1 kHz, FM Source = Sine,
- And \(200 \text{ Hz} \leq \text{deviation} \leq 40 \text{ kHz}\).

- \((\text{Deviation} + \text{modulation rate}) > 0.2\):
  - \(< (3\% \text{ of the set value} + 20 \text{ Hz})\)
  - \(< (1.26\% \text{ of the set value} + 20 \text{ Hz}) \text{ (typ.)}\)

- \((\text{Deviation} + \text{modulation rate}) > 1.2\):
  - \(< (3\% \text{ of the set value} + 20 \text{ Hz})\)
  - \(< (1.84\% \text{ of the set value} + 20 \text{ Hz}) \text{ (typ.)}\)

#### Distortion (MG3710A)

Under the conditions:
- Output level ≤ 4 dBm,
- \(100 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} \leq 2700 \text{ MHz}\),
- After CAL execution, modulation rate = 1 kHz, FM Source = Sine,
- And \(\text{deviation} = 22.5 \text{ kHz}\).

- < 0.5% (Nominal)

#### Distortion (MG3740A)

Under the conditions:
- Output level ≤ 4 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 \(\text{deviation} = 22.5 \text{ kHz}\).

- < 0.5% (Nominal)

- < 0.4%

- Under the conditions:
  - Output level ≤ 4 dBm,
  - \(1 \text{ MHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} \leq 2700 \text{ MHz}\),
  - After CAL execution, modulation rate = 1 kHz, FM Source = Sine,
  - And \(\text{deviation} = 22.5 \text{ kHz}\).

- < 0.4%

- Under the conditions:
  - Output level ≤ 4 dBm,
  - \(100 \text{ kHz} + 2 \times (\text{modulation rate} + 2 \times \text{deviation}) \leq \text{frequency} < 1 \text{ MHz}\),
  - After CAL execution, modulation rate = 1 kHz, FM Source = Sine,
  - And \(\text{deviation} = 3.5 \text{ kHz}\).

- < 1% (Nominal)
<Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Modulation (Cont’d) Distortion (MG3740A)</td>
<td>Under the conditions: output level ≤ 4 dBm, 1 MHz + 2 × (modulation rate + 2 × deviation) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, FM Source = Sine, and deviation = 3.5 kHz. &lt; 0.5%</td>
</tr>
<tr>
<td>Modulation Frequency Response (MG3710A)</td>
<td>Under the conditions: 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)</td>
</tr>
<tr>
<td>Modulation Frequency Response (MG3740A)</td>
<td>Under the conditions: output level ≤ 4 dBm, 10 MHz ≤ frequency ≤ 2700 MHz, deviation = 40 kHz, after CAL execution, and bandwidth within ±1 dB. 20 Hz ≤ modulation rate ≤ 20 kHz (nominal)</td>
</tr>
</tbody>
</table>
<Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase Modulation</td>
<td>Available only for internal modulation. Specified only for the modulation onto CW. In MG3740A, Optimize Function is set to Distortion.</td>
</tr>
<tr>
<td>PM Deviation</td>
<td>Range: A value between 0 rad and 160 rad or the value of 40 MHz divided by the modulation rate, whichever is smaller.</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.001 rad</td>
</tr>
<tr>
<td>Deviation Accuracy</td>
<td>Output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, φM Source = Sine, and deviation ≤ 20 rad.</td>
</tr>
<tr>
<td>(MG3710A)</td>
<td>&lt; (2% of the set value + 0.02 rad) (Nominal)</td>
</tr>
<tr>
<td>Deviation Accuracy</td>
<td>Output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, φM Source = Sine, and deviation ≤ 0.7 rad.</td>
</tr>
<tr>
<td>(MG3740A)</td>
<td>&lt; (2% of the set value + 0.02 rad) (Nominal)</td>
</tr>
<tr>
<td>Distortion</td>
<td>Output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, after CAL execution, modulation rate = 1 kHz, φM Source = Sine, and deviation = 20 rad.</td>
</tr>
<tr>
<td></td>
<td>&lt; (0.2% (Nominal))</td>
</tr>
<tr>
<td></td>
<td>&lt; (1.84% of the set value + 0.02 rad) (typ.)</td>
</tr>
<tr>
<td>Modulation Frequency Response (MG3710A)</td>
<td>Output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ±1 dB.</td>
</tr>
<tr>
<td></td>
<td>20 Hz ≤ modulation rate ≤ 20 kHz (nominal)</td>
</tr>
<tr>
<td>Modulation Frequency Response (MG3740A)</td>
<td>Output level ≤ 4 dBm, 100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ±1 dB.</td>
</tr>
<tr>
<td></td>
<td>20 Hz ≤ modulation rate ≤ 20 kHz (nominal)</td>
</tr>
</tbody>
</table>
<Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Modulation</strong></td>
<td></td>
</tr>
<tr>
<td>On/Off ratio</td>
<td>&gt;70 dB (50 MHz ≤ Output frequency ≤ 3 GHz)</td>
</tr>
<tr>
<td>Minimum pulse width</td>
<td>1 μs (Nominal)</td>
</tr>
<tr>
<td>Rising/Falling time</td>
<td>≤50 ns (10 to 90%) (Nominal)</td>
</tr>
<tr>
<td>Pulse repetition frequency</td>
<td>DC to 1 MHz (Duty 50%)</td>
</tr>
<tr>
<td>External pulse modulation signal input</td>
<td>Rear panel AUX connector, TTL</td>
</tr>
</tbody>
</table>

**Internal modulation signal**

<table>
<thead>
<tr>
<th>Waveform</th>
<th>Sine wave, Triangular wave, Square wave, Ramp wave (Positive or Negative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modulation rate</td>
<td>0.01 Hz to 40 MHz or (50 MHz – FMDeviation)</td>
</tr>
<tr>
<td></td>
<td>Triangular wave, Square wave, Ramp wave: 0.01 Hz to 4 MHz or (5 MHz – FMDeviation)</td>
</tr>
<tr>
<td>Frequency resolution</td>
<td>0.1 Hz</td>
</tr>
<tr>
<td>Phase</td>
<td>–180 deg to 180 deg</td>
</tr>
<tr>
<td>Phase resolution</td>
<td>0.1 deg</td>
</tr>
</tbody>
</table>

**External modulation signal**

- When MG3710A/MG3740A-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

<table>
<thead>
<tr>
<th>Modulation type</th>
<th>AM, FM, φM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Impedance</td>
<td>50 Ω/600 Ω/Hi-Z (100 kΩ/70 pF) (nominal)</td>
</tr>
<tr>
<td>Coupling</td>
<td>DC or AC is alternatively selectable.</td>
</tr>
<tr>
<td>Input level</td>
<td>For set value, 2 Vp-p (nominal)</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>DC coupling: DC to 1 MHz (nominal)</td>
</tr>
<tr>
<td></td>
<td>AC coupling: 20 Hz (typ.) to 1 MHz (nominal)</td>
</tr>
<tr>
<td>Simultaneous</td>
<td>AM + FM</td>
</tr>
<tr>
<td>modulation</td>
<td>AM + φM</td>
</tr>
<tr>
<td></td>
<td>Internal 1 + Internal 2</td>
</tr>
<tr>
<td></td>
<td>Internal + External</td>
</tr>
<tr>
<td></td>
<td>FM and φM cannot enabled simultaneously.</td>
</tr>
</tbody>
</table>
### <Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| External modulation signal (Cont’d) Amplitude Modulation Frequency Response (MG3710A) | Under the conditions:  peak level ≤ 4 dBm, 100 kHz ≤ 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 Hz ≤ modulation rate ≤ 20 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.  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 ≤ 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 ≤ frequency range ≤ 2700 MHz, AM Depth Type = Lin, modulation ratio m = 90%, 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)
### <Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| External modulation signal (Cont’d) Amplitude Modulation Frequency Response (MG3740A) | Under the conditions: peak level \( \leq 4 \text{ dBm} \), \( 100 \text{ kHz} \leq \text{frequency range} \leq 98 \text{ MHz} \), AM Depth Type = Lin, modulation ratio \( m = 30\% \), after CAL execution, and bandwidth within \( \pm 1.5 \text{ dB} \).  
  DC coupling: DC \( \leq \) modulation rate \( \leq 20 \text{ kHz} \) (nominal)  
  AC coupling: 20 Hz \( \leq \) modulation rate \( \leq 20 \text{ kHz} \) (nominal)
|                        | Under the conditions: peak level \( \leq 4 \text{ dBm} \), \( 100 \text{ kHz} \leq \text{frequency range} \leq 98 \text{ MHz} \), AM Depth Type = Lin, modulation ratio \( m = 90\% \), after CAL execution, and bandwidth within \( \pm 1.5 \text{ dB} \).  
  DC coupling: DC \( \leq \) modulation rate \( \leq 20 \text{ kHz} \) (nominal)  
  AC coupling: 20 Hz \( \leq \) modulation rate \( \leq 20 \text{ kHz} \) (nominal)
|                        | Under the conditions: peak level \( \leq 4 \text{ dBm} \), \( 98 \text{ MHz} \leq \text{frequency range} \leq 2700 \text{ MHz} \), AM Depth Type = Lin, modulation ratio \( m = 30\% \), after CAL execution, and bandwidth within \( \pm 1 \text{ dB} \).  
  DC coupling: DC \( \leq \) modulation rate \( < 50 \text{ Hz} \) (nominal)  
  50 Hz \( \leq \) modulation rate \( \leq 100 \text{ kHz} \) (typ.)  
  AC coupling: 20 Hz \( \leq \) modulation rate \( < 50 \text{ Hz} \) (nominal)  
  50 Hz \( \leq \) modulation rate \( \leq 100 \text{ kHz} \) (typ.)
|                        | Under the conditions: peak level \( \leq 4 \text{ dBm} \), \( 98 \text{ MHz} \leq \text{frequency range} \leq 2700 \text{ MHz} \), AM Depth Type = Lin, modulation ratio \( m = 90\% \), after CAL execution, and bandwidth within \( \pm 1 \text{ dB} \).  
  DC coupling: DC \( \leq \) modulation rate \( < 50 \text{ Hz} \) (nominal)  
  50 Hz \( \leq \) modulation rate \( \leq 100 \text{ kHz} \) (typ.)  
  AC coupling: 20 Hz \( \leq \) modulation rate \( < 50 \text{ Hz} \) (nominal)  
  50 Hz \( \leq \) modulation rate \( \leq 100 \text{ kHz} \) (typ.)
### <Analog modulation/Pulse modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| External modulation signal (Cont’d) | Under the conditions:  
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.  
DC coupling: DC ≤ modulation rate ≤ 20 kHz (nominal)  
AC coupling: 20 Hz ≤ modulation rate ≤ 20 kHz (nominal) |
| Frequency Modulation  
Frequency Response (MG3710A) | Under the conditions:  
output level ≤ 4 dBm,  
100 kHz + 2 × (modulation rate + 2 × deviation) ≤ frequency < 10 MHz,  
deviation = 40 kHz, 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:  
output level ≤ 4 dBm,  
10 MHz ≤ frequency ≤ 2700 MHz, deviation = 40 kHz, after CAL execution, and bandwidth within ±1 dB.  
DC coupling: DC ≤ modulation rate < 50 Hz (nominal)  
50 Hz ≤ modulation rate ≤ 200 kHz (typ.)  
AC coupling: 20 Hz ≤ modulation rate < 50 Hz (nominal)  
50 Hz ≤ modulation rate ≤ 200 kHz (typ.) |
| Frequency Modulation  
Frequency Response (MG3740A) | Under the conditions:  
output level ≤ 4 dBm,  
100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, deviation = 2 rad, 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:  
output level ≤ 4 dBm,  
100 kHz + 2 × (modulation rate + 2 × deviation × modulation rate) ≤ frequency ≤ 2700 MHz, deviation = 2 rad, after CAL execution, and bandwidth within ±1 dB.  
DC coupling: DC ≤ modulation rate < 200 Hz (nominal)  
200 Hz ≤ modulation rate ≤ 20 kHz (typ.)  
AC coupling: 20 Hz ≤ modulation rate < 200 Hz (nominal)  
200 Hz ≤ modulation rate ≤ 20 kHz (typ.) |
### Vector modulation

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modulation Frequency</strong></td>
<td><strong>Response</strong></td>
</tr>
<tr>
<td>1st SG (MG3710A)</td>
<td>At 18 to 28°C</td>
</tr>
<tr>
<td></td>
<td>When MG3710A-043/143 is not installed:</td>
</tr>
<tr>
<td></td>
<td>Internal Channel Correction = On,</td>
</tr>
<tr>
<td></td>
<td>Random signal of Bandwidth 160 MHz, Crest Factor 11 dB.</td>
</tr>
<tr>
<td></td>
<td>Output level = –7 dBm</td>
</tr>
<tr>
<td></td>
<td>At output frequency: 850 MHz/1.8 GHz/1.9 GHz/2.2 GHz, ±0.6 dB (At Center Frequency ±10 MHz)</td>
</tr>
<tr>
<td></td>
<td>±1.3 dB (At Center Frequency ±50 MHz)</td>
</tr>
<tr>
<td></td>
<td>At output frequency: 3.5 GHz/5.8 GHz, ±0.6 dB (At Center Frequency ±10 MHz)</td>
</tr>
<tr>
<td></td>
<td>±1.9 dB (At Center Frequency ±50 MHz)</td>
</tr>
<tr>
<td></td>
<td>When MG3710A-043/143 is installed:</td>
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<tr>
<td></td>
<td>Internal Channel Correction = On,</td>
</tr>
<tr>
<td></td>
<td>Random signal of Bandwidth 160 MHz, Crest Factor 11 dB.</td>
</tr>
<tr>
<td></td>
<td>Output level = –10 dBm</td>
</tr>
<tr>
<td></td>
<td>At output frequency: 850 MHz/1.8 GHz/1.9 GHz/2.2 GHz, ±0.6 dB (At Center Frequency ±10 MHz)</td>
</tr>
<tr>
<td></td>
<td>±1.8 dB (At Center Frequency ±50 MHz)</td>
</tr>
<tr>
<td></td>
<td>At output frequency: 3.5 GHz/5.8 GHz, ±0.6 dB (At Center Frequency ±10 MHz)</td>
</tr>
<tr>
<td></td>
<td>±2.4 dB (At Center Frequency ±50 MHz)</td>
</tr>
<tr>
<td>2nd SG (MG3710A)</td>
<td>Same as 1st SG (MG3710A)</td>
</tr>
</tbody>
</table>
### Vector accuracy

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st SG (MG3710A)</td>
<td>At 18 to 28°C</td>
</tr>
<tr>
<td></td>
<td>After CAL execution</td>
</tr>
<tr>
<td></td>
<td>When MG3710A-043/143 is not installed:</td>
</tr>
<tr>
<td></td>
<td>When W-CDMA (Test Model 4) is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+7 dBm (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+13 dBm (When MG3710A-041/141 is installed),</td>
</tr>
<tr>
<td></td>
<td>≤0.62% (rms) (0.6% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When GSM is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+7 dBm (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+13 dBm (When MG3710A-041/141 is installed),</td>
</tr>
<tr>
<td></td>
<td>≤0.84° (rms) (0.8° (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When EDGE is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+7 dBm (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+13 dBm (When MG3710A-041/141 is installed),</td>
</tr>
<tr>
<td></td>
<td>≤0.84% (rms) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When LTE (20MHz Test Model 3.1) is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 600 MHz to 2700 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+7 dBm (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+13 dBm (When MG3710A-041/141 is installed),</td>
</tr>
<tr>
<td></td>
<td>≤0.82% (rms) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 3400 MHz to 3800 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+4 dBm (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤+10 dBm (When MG3710A-041/141 is installed),</td>
</tr>
<tr>
<td></td>
<td>≤0.82% (rms) (0.8% (rms) typ.)</td>
</tr>
</tbody>
</table>
## Vector accuracy

### 1st SG (MG3710A)

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>When MG3710A-043/143 is installed:</td>
<td></td>
</tr>
<tr>
<td>When W-CDMA (Test Model 4) is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 4 dBm (When MG3710A-041/141 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 10 dBm (When MG3710A-041/141 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.62% (rms) (0.6% (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When GSM is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 4 dBm (When MG3710A-041/141 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 10 dBm (When MG3710A-041/141 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.84° (rms) (0.8° (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When EDGE is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 4 dBm (When MG3710A-041/141 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 10 dBm (When MG3710A-041/141 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.84% (rms) (0.8% (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When LTE (20MHz Test Model 3.1) is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 600 MHz to 2700 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 4 dBm (When MG3710A-041/141 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 10 dBm (When MG3710A-041/141 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.82% (rms) (0.8% (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 3400 MHz to 3800 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 4 dBm (When MG3710A-041/141 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 7 dBm (When MG3710A-041/141 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.82% (rms) (0.8% (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When MG3710A-073/173 is not installed:</td>
<td></td>
</tr>
<tr>
<td>When W-CDMA (Test Model 4) is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 7 dBm (When MG3710A-071/171 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 13 dBm (When MG3710A-071/171 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.62% (rms) (0.6% (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When GSM is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 7 dBm (When MG3710A-071/171 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 13 dBm (When MG3710A-071/171 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.84° (rms) (0.8° (rms) typ.)</td>
<td></td>
</tr>
<tr>
<td>When EDGE is modulated:</td>
<td></td>
</tr>
<tr>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 7 dBm (When MG3710A-071/171 is not installed),</td>
<td></td>
</tr>
<tr>
<td>Output level ≤ 13 dBm (When MG3710A-071/171 is installed),</td>
<td></td>
</tr>
<tr>
<td>≤ 0.84% (rms) (0.8% (rms) typ.)</td>
<td></td>
</tr>
</tbody>
</table>
## Vector Modulation

### Vector Accuracy

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd SG (MG3710A)</td>
<td>When LTE (20MHz Test Model 3.1) is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 600 MHz to 2700 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +7 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +13 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.82% \text{ (rms)} ) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 3400 MHz to 3800 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +4 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +10 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.82% \text{ (rms)} ) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When MG3710A-073/173 is installed:</td>
</tr>
<tr>
<td></td>
<td>When W-CDMA (Test Model 4) is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 2200 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +4 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +10 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.62% \text{ (rms)} ) (0.6% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When GSM is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +4 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +10 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.84% \text{ (rms)} ) (0.8% (rms) typ.)</td>
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<tr>
<td></td>
<td>When EDGE is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 800 MHz to 900 MHz, 1800 MHz to 1900 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +4 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +10 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.84% \text{ (rms)} ) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>When LTE (20MHz Test Model 3.1) is modulated:</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 600 MHz to 2700 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +4 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +10 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.82% \text{ (rms)} ) (0.8% (rms) typ.)</td>
</tr>
<tr>
<td></td>
<td>Output frequency: 3400 MHz to 3800 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +1 \text{ dBm} ) (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level (\leq +7 \text{ dBm} ) (When MG3710A-071/171 is installed),</td>
</tr>
<tr>
<td></td>
<td>( \leq 0.82% \text{ (rms)} ) (0.8% (rms) typ.)</td>
</tr>
</tbody>
</table>

### Carrier Leak

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>MG3710A or MG3740A with MG3740A-020/120 installed</td>
<td>Under the conditions of the temperature range between 18°C and 28°C, RMS Value = 0 dB, and after CAL execution.</td>
</tr>
<tr>
<td></td>
<td>( \leq -55 \text{ dBc} ) ( (100 \text{ MHz} \leq \text{frequency} &lt; 4 \text{ GHz}) )</td>
</tr>
<tr>
<td></td>
<td>( \leq -45 \text{ dBc} ) ( (4 \text{ GHz} \leq \text{frequency}) )</td>
</tr>
</tbody>
</table>

### Image Rejection

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>In MG3710A, 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.</td>
<td>( \leq -50 \text{ dBc} ) ( (200 \text{ MHz} \leq \text{frequency} &lt; 4 \text{ GHz}) )</td>
</tr>
<tr>
<td></td>
<td>( \leq -43 \text{ dBc} ) ( (4 \text{ GHz} \leq \text{frequency}) )</td>
</tr>
</tbody>
</table>
<Vector modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image rejection</td>
<td>MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td></td>
<td>Under the conditions of the temperature range between 18°C and 28°C,</td>
</tr>
<tr>
<td></td>
<td>RMS Value = 0 dB, after CAL execution, and complex CW at 1 MHz or less.</td>
</tr>
<tr>
<td></td>
<td>( \leq -50 \text{ dBC} ) ( (200 \text{ MHz} \leq \text{frequency} &lt; 4 \text{ GHz}) )</td>
</tr>
<tr>
<td></td>
<td>( \leq -43 \text{ dBC} ) ( (4 \text{ GHz} \leq \text{frequency}) )</td>
</tr>
<tr>
<td>ACLR</td>
<td>Under the conditions of the temperature between 18°C and 28°C and</td>
</tr>
<tr>
<td></td>
<td>W-CDMA (Test Model 1 64DPCH) signal generation.</td>
</tr>
<tr>
<td>1st SG (MG3710A)</td>
<td>When MG3710A-043/143 is not installed:</td>
</tr>
<tr>
<td></td>
<td>300 MHz ( \leq ) Output frequency ( &lt; 800 \text{ MHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} ) (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq +5 \text{ dBm} ) (When MG3710A-041/041 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -68 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -70 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>800 MHz ( \leq ) Output frequency ( &lt; 1 \text{ GHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} ) (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq +5 \text{ dBm} ) (When MG3710A-041/041 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>1 GHz ( \leq ) Output frequency ( &lt; 1.8 \text{ GHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} ) (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq +5 \text{ dBm} ) (When MG3710A-041/041 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -70 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>1.8 GHz ( \leq ) Output frequency ( &lt; 2.2 \text{ GHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} ) (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq +5 \text{ dBm} ) (When MG3710A-041/041 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>2.2 GHz ( \leq ) Output frequency ( &lt; 3.0 \text{ GHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} ) (When MG3710A-041/141 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq +5 \text{ dBm} ) (When MG3710A-041/041 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -69 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -71 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>3.0 GHz ( \leq ) Output frequency ( &lt; 3.8 \text{ GHz} ),</td>
</tr>
<tr>
<td></td>
<td>Output level ( \leq -2 \text{ dBm} )</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ( \leq -67 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ( \leq -67 \text{ dBC}/3.84 \text{ MHz} )</td>
</tr>
</tbody>
</table>
Appendix A Specifications

<Vector modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| ACLR 1st SG (MG3710A) | When MG3710A-043/143 is installed:  
300 MHz ≤ Output frequency < 800 MHz,  
Output level ≤ -5 dBm (When MG3710A-041/141 is not installed),  
Output level ≤ +2 dBm (When MG3710A-041/041 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 ≤ -5 dBm (When MG3710A-041/141 is not installed),  
Output level ≤ +2 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 ≤ -5 dBm (When MG3710A-041/141 is not installed),  
Output level ≤ +2 dBm (When MG3710A-041/041 is installed),  
5 MHz offset: ≤ -71 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 MG3710A-041/141 is not installed),  
Output level ≤ +2 dBm (When MG3710A-041/041 is installed),  
5 MHz offset: ≤ -71 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 MG3710A-041/141 is not installed),  
Output level ≤ +2 dBm (When MG3710A-041/041 is installed),  
5 MHz offset: ≤ -69 dBc/3.84 MHz  
10 MHz offset: ≤ -71 dBc/3.84 MHz  
3.0 GHz ≤ Output frequency ≤ 3.8 GHz,  
Output level ≤ -5 dBm  
5 MHz offset: ≤ -67 dBc/3.84 MHz  
10 MHz offset: ≤ -67 dBc/3.84 MHz |
## Appendix A Specifications

### <Vector modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACLR</td>
<td>When MG3710A-073/173 is not installed:</td>
</tr>
<tr>
<td>2nd SG (MG3710A)</td>
<td>300 MHz ≤ Output frequency &lt; 800 MHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ +5 dBm (When MG3710A-071/071 is installed),</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ≤ -68 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -70 dBc/3.84 MHz</td>
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<tr>
<td></td>
<td>800 MHz ≤ Output frequency &lt; 1 GHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),</td>
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<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>1 GHz ≤ Output frequency &lt; 1.8 GHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),</td>
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<tr>
<td></td>
<td>Output level ≤ +5 dBm (When MG3710A-071/071 is installed),</td>
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<td></td>
<td>5 MHz offset: ≤ -70 dBc/3.84 MHz</td>
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<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>1.8 GHz ≤ Output frequency &lt; 2.2 GHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ +5 dBm (When MG3710A-071/071 is installed),</td>
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<td></td>
<td>5 MHz offset: ≤ -71 dBc/3.84 MHz</td>
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<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>2.2 GHz ≤ Output frequency &lt; 3.0 GHz,</td>
</tr>
<tr>
<td></td>
<td>Output level ≤ -2 dBm (When MG3710A-071/171 is not installed),</td>
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<tr>
<td></td>
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<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
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<td></td>
<td>3.0 GHz ≤ Output frequency &lt; 3.8 GHz,</td>
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<td></td>
<td>Output level ≤ -2 dBm</td>
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<tr>
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<tr>
<td></td>
<td>10 MHz offset: ≤ -67 dBc/3.84 MHz</td>
</tr>
</tbody>
</table>
### Appendix A Specifications

**<Vector modulation> Cont’d**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACLR 2nd SG (MG3710A)</td>
<td>When MG3710A-073/173 is installed:</td>
</tr>
<tr>
<td></td>
<td>300 MHz ≤ Output frequency &lt; 800 MHz, Output level ≤ -5 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/071 is installed), 5 MHz offset: ≤ -68 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -70 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>800 MHz ≤ Output frequency &lt; 1 GHz, Output level ≤ -5 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/071 is installed), 5 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>1 GHz ≤ Output frequency &lt; 1.8 GHz, Output level ≤ -5 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/071 is installed), 5 MHz offset: ≤ -70 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>1.8 GHz ≤ Output frequency &lt; 2.2 GHz, Output level ≤ -5 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
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<tr>
<td></td>
<td>(When MG3710A-071/071 is installed), 5 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
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<td></td>
<td>2.2 GHz ≤ Output frequency &lt; 3.0 GHz, Output level ≤ -5 dBm</td>
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<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
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<tr>
<td></td>
<td>(When MG3710A-071/071 is installed), 5 MHz offset: ≤ -69 dBc/3.84 MHz</td>
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<tr>
<td></td>
<td>10 MHz offset: ≤ -71 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>3.0 GHz ≤ Output frequency &lt; 3.8 GHz, Output level ≤ -5 dBm</td>
</tr>
<tr>
<td></td>
<td>(When MG3710A-071/171 is not installed), Output level ≤ +2 dBm</td>
</tr>
<tr>
<td></td>
<td>5 MHz offset: ≤ -67 dBc/3.84 MHz</td>
</tr>
<tr>
<td></td>
<td>10 MHz offset: ≤ -67 dBc/3.84 MHz</td>
</tr>
</tbody>
</table>
## Appendix A Specifications

### <Vector modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level error from CW during vector modulation</td>
<td>Under the conditions of the temperature between 18°C and 28°C and AWGN signal of bandwidth = 5 MHz.</td>
</tr>
</tbody>
</table>
| 1st SG (MG3710A) When MG3710A-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) |
| 2nd SG (MG3710A) When MG3710A-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) |
| When MG3710A-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) |
| 2nd SG (MG3710A) When MG3710A-073/173 is not 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) |
| When MG3710A-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) |
## <Vector modulation> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ input/output</td>
<td>MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td>Base band IQ adjustment</td>
<td></td>
</tr>
<tr>
<td>DC offset function</td>
<td>Range: –20.000% to +20.000%</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.025%</td>
</tr>
<tr>
<td>Gain balancing function</td>
<td>Range: –1.000 dB to +1.000 dB</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.001 dB</td>
</tr>
<tr>
<td>IQ adjustment function</td>
<td>Range: –10.00 deg to +10.00 deg</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.01 deg</td>
</tr>
<tr>
<td>IQ Phase adjustment function</td>
<td>Range: –360.00 deg to +360.00 deg</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.01 deg</td>
</tr>
<tr>
<td>IQ Skew adjustment function</td>
<td>Range: –800.00 ns to +800.00 ns</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1 ps</td>
</tr>
<tr>
<td>IQ Delay adjustment function</td>
<td>Range: –400.000 ns to +400.000 ns</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1 ps</td>
</tr>
<tr>
<td>IQ input</td>
<td></td>
</tr>
<tr>
<td>When MG3710A-018/118 is installed:</td>
<td></td>
</tr>
<tr>
<td>Modulation bandwidth</td>
<td>Base band 80 MHz (Nominal)</td>
</tr>
<tr>
<td></td>
<td>RF 160 MHz (Nominal)</td>
</tr>
<tr>
<td>Input level</td>
<td>√(I^2+Q^2) = 85 mV (rms) (optimum value of level accuracy)</td>
</tr>
<tr>
<td>DC offset function</td>
<td>Range: –100 mV to 100 mV</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1 mV</td>
</tr>
<tr>
<td>Input connector</td>
<td>Connector: Front panel, BNC-J connector (I Input, Q Input)</td>
</tr>
<tr>
<td></td>
<td>Maximum input level: –1 V (peak) ≤ I, Q ≤+1 V (peak)</td>
</tr>
<tr>
<td></td>
<td>Impedance: 50 Ω (Nominal)</td>
</tr>
</tbody>
</table>
### Appendix A  Specifications

**<Vector modulation> Cont’d**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>IQ output</td>
<td>When MG3710A-018/118 is installed:</td>
</tr>
<tr>
<td>Output voltage range</td>
<td>Under open circuit output conditions, with output voltage amplitude +DC offset: –2.5 V to +5 V</td>
</tr>
<tr>
<td>DC offset function</td>
<td>Under an open circuited output conditions</td>
</tr>
<tr>
<td>Inphase DC offset</td>
<td>Range: –2.5 V to 5 V</td>
</tr>
<tr>
<td>Resolution</td>
<td>2 mV</td>
</tr>
<tr>
<td>Differential DC offset</td>
<td>Range: –50 mV to 50 mV</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 mV</td>
</tr>
<tr>
<td>IQ adjustment function</td>
<td>Uses Baseband IQ adjustment function</td>
</tr>
<tr>
<td>Output connector</td>
<td>Connector: Rear panel, BNC-J connector (I Output/\bar{I} Output, Q Output/\bar{Q} Output)</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ω (Nominal)</td>
</tr>
</tbody>
</table>

**<Arbitrary waveform generator>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waveform resolution</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed I/Q is 14, 15, or 16 bits</td>
</tr>
<tr>
<td>Modulation bandwidth</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td>MG3710A:</td>
<td>160 MHz Bandwidth</td>
</tr>
<tr>
<td>MG3740A:</td>
<td>2 MHz Bandwidth (Over sampling rate = 4, the maximum number of Sampling rate = 8 MHz)</td>
</tr>
<tr>
<td>Reconstruction filter</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed 80 MHz</td>
</tr>
<tr>
<td>Base band level adjustment</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td>Input level adjustment</td>
<td>Capability of the quadrature modulator. (RMS Value Tuning)</td>
</tr>
<tr>
<td>Decreasing a level leads</td>
<td>to less distortion.</td>
</tr>
<tr>
<td>Increasing a level leads</td>
<td>to less floor noise.</td>
</tr>
<tr>
<td>Adjustable range</td>
<td>±8 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Marker output</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td>In case of 14 bit resolution</td>
<td>Three signals among waveform patterns or three signals generated in real-time.</td>
</tr>
<tr>
<td>In case of 15 bit resolution</td>
<td>One signal among waveform patterns or three signals generated in real-time.</td>
</tr>
<tr>
<td>In case of 16 bit resolution</td>
<td>Three signals generated in real-time.</td>
</tr>
<tr>
<td>Toggling between positive</td>
<td>logic pulse output and negative logic pulse output is available.</td>
</tr>
<tr>
<td>logic pulse output</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix A  Specifications

**<Arbitrary waveform generator> Cont’d**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Baseband Reference clock signal</strong></td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td>Range</td>
<td>20 kHz to 200 MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.001 Hz</td>
</tr>
<tr>
<td><strong>External Baseband Reference clock signal</strong></td>
<td>When MG3710A-017/117 is installed:</td>
</tr>
<tr>
<td>Range</td>
<td>20 kHz to 50 MHz</td>
</tr>
<tr>
<td>Divisional and multiplication function</td>
<td>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.</td>
</tr>
<tr>
<td>Input connector</td>
<td>Rear panel, BNC-J connector (BB REF CLK Input)</td>
</tr>
<tr>
<td>Input level</td>
<td>$\geq 0.2 \mathrm{Vp-p/50 \Omega}$ (AC coupling) (Nominal)</td>
</tr>
<tr>
<td>Others</td>
<td>Function of External Input or MIMO connection (BB Ref Sync) is selectable.</td>
</tr>
</tbody>
</table>

| 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      |                                                                                                                                           |
| Not installed                | Not installed 64 Msamples                                                                                                                  |
| Installed                    | Not installed 256 Msamples                                                                                                                 |
| Not installed                | Installed 1024 Msamples                                                                                                                   |

| Memory capacity: 2nd SG      |                                                                                                                                           |
| 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/MG3740A-048/148 is installed, this function synthesizes the contents of two channel memories to generate a baseband waveform. |
| Memory synthesizing function 2nd SG | When MG3710A/MG3740A-078/178 is installed, this function synthesizes the contents of two channel memories to generate a baseband waveform. |
### Appendix A Specifications

#### <Arbitrary waveform generator> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| **Frequency offset** | In MG3710A: ± (200 MHz × 0.8 – Waveform data bandwidth)/2 at the maximum  
When MG3740A-020/120 is installed: ± (8 MHz × 0.8 – Waveform data bandwidth)/2 at the maximum |
| **Sequence function** | In MG3710A 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: 1 Hz |
| **Pattern trigger** | In MG3710A 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 or MG3740A with MG3740A-020/120 installed  
Starts outputting waveform pattern in sync with trigger signal.  
Start trigger or frame trigger is alternatively selectable.  
Start trigger: Used to start a waveform generation.  
Frame trigger: 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. |
### <AWGN generating function>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWGN generating function</td>
<td></td>
</tr>
<tr>
<td>1st SG</td>
<td>When MG3710A·049/149 is installed:</td>
</tr>
<tr>
<td></td>
<td>Absolute value of CN ratio: ≤40 dB</td>
</tr>
<tr>
<td>2nd SG</td>
<td>When MG3710A·079/179 is installed:</td>
</tr>
<tr>
<td></td>
<td>Absolute value of CN ratio: ≤40 dB</td>
</tr>
<tr>
<td>Band restriction filter</td>
<td>When MG3710A·049/079/149/179 is installed:</td>
</tr>
<tr>
<td></td>
<td>The band restriction of AWGN can be set in the following range.</td>
</tr>
<tr>
<td></td>
<td>From 20% to 80% of waveform sampling rate</td>
</tr>
</tbody>
</table>

### <Sweep/List function>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep function</td>
<td>Frequency and level sweep can be set at 1000-point resolution.</td>
</tr>
<tr>
<td>List function</td>
<td>Sweeping points of both frequency and level can be set individually to 500 points.</td>
</tr>
</tbody>
</table>
**Appendix A  Specifications**

## <BER measurement function>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector</td>
<td>When MG3710A/MG3740A-021/121 is installed: Connector: Rear panel, AUX Connector</td>
</tr>
<tr>
<td>Input level</td>
<td>TTL</td>
</tr>
<tr>
<td>Input signal</td>
<td>Data, Clock, Enable</td>
</tr>
<tr>
<td>Input bit rate</td>
<td>100 bps to 40 Mbps</td>
</tr>
<tr>
<td>Measurable patterns</td>
<td>PN,9, PN,1, PN,5, PN,0, PN,3, AL,0, AL,1, Repeat of “01”</td>
</tr>
<tr>
<td>Synchronization establishing condition</td>
<td>PN order × 2 bits error free</td>
</tr>
<tr>
<td>PN signal</td>
<td>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.</td>
</tr>
<tr>
<td>PNfix signal</td>
<td>10 bit error free</td>
</tr>
<tr>
<td>ALL0, ALL1, repetition of 01</td>
<td>8 to 1024 bit (variable) error free</td>
</tr>
<tr>
<td>UserDefine</td>
<td>A start bit to be used for detection of synchronization can also be selected.</td>
</tr>
<tr>
<td>Re-synchronization judgment</td>
<td>x/y: y = number of measurement bit: selectable among 500, 5000 and 50000</td>
</tr>
<tr>
<td></td>
<td>x = number of error bits among y bits: selectable in the range from 1 to y/2</td>
</tr>
<tr>
<td>Measurable bit</td>
<td>( \leq 2^{32} - 1 ) bit</td>
</tr>
<tr>
<td>Number of measurable error bits</td>
<td>( \leq 2^{32} - 1 ) bit</td>
</tr>
<tr>
<td>Measurement end condition</td>
<td>Number of measurement bits, number of measurement error bits</td>
</tr>
<tr>
<td>Automatic re-synchronization function</td>
<td>Can be toggled on and off.</td>
</tr>
<tr>
<td>Operation of re-synchronization</td>
<td>Can be selected Count Clear or Count Keep.</td>
</tr>
<tr>
<td>Measurement mode</td>
<td>Single, Endless, Continuous</td>
</tr>
<tr>
<td>Display</td>
<td>Status, Error, Error Rate, Error Count, SyncLoss Count, number of measurement bits</td>
</tr>
<tr>
<td>Alternating polarity function</td>
<td>Polarity of Data, Clock and/or Enable can be alternatively switched.</td>
</tr>
<tr>
<td>Measurement result clearing function</td>
<td>This function can start the measurement from 0 by clearing the measurement values while keeping synchronization during the BER measurement.</td>
</tr>
</tbody>
</table>
### <Connector>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output connector (RF Output)</td>
<td>Refer to &lt;Output connector&gt; for details.</td>
</tr>
<tr>
<td>Output connector (2nd RF Output)</td>
<td>When MG3710A/MG3740A-062/064/066/162/164/166 is installed: Refer to &lt;Output connector&gt; for details.</td>
</tr>
<tr>
<td>Analog IQ input (I Input) (Q Input)</td>
<td>When MG3710A-018/118 is installed: Refer to &lt;Vector modulation&gt;, IQ input for details.</td>
</tr>
<tr>
<td>Analog IQ output (I Input/I Input) (Q Input/Q Input)</td>
<td>When MG3710A/MG3740A-062/064/066/162/164/166 is installed:Refer to &lt;Vector modulation&gt;, IQ output for details.</td>
</tr>
<tr>
<td>External reference input (REF Input)</td>
<td>Connector Rear panel, BNC-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Frequency 5 MHz/10 MHz/13 MHz</td>
</tr>
<tr>
<td></td>
<td>Operating range ±1 ppm</td>
</tr>
<tr>
<td></td>
<td>Input level –15 dBm ≤ level ≤ +20 dBm, (AC coupling)</td>
</tr>
<tr>
<td>Reference signal output (Buffer Output)</td>
<td>Connector Rear panel, BNC-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Frequency 10 MHz</td>
</tr>
<tr>
<td></td>
<td>Output level ≥0 dBm (AC coupling)</td>
</tr>
<tr>
<td>Start Frame TRIG Input</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td></td>
<td>Connector Rear panel, BNC-J connector</td>
</tr>
<tr>
<td></td>
<td>Output level TTL</td>
</tr>
<tr>
<td>Marker1 Output</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td></td>
<td>Connector Rear panel, BNC-J connector</td>
</tr>
<tr>
<td></td>
<td>Output level TTL</td>
</tr>
<tr>
<td>Pattern TRIG1 Input</td>
<td>In MG3710A or MG3740A with MG3740A-020/120 installed</td>
</tr>
<tr>
<td></td>
<td>Connector Rear panel, BNC-J connector</td>
</tr>
<tr>
<td></td>
<td>Input level TTL</td>
</tr>
<tr>
<td>BB REF CLK Input</td>
<td>When MG3710A-017/117 is installed:</td>
</tr>
<tr>
<td></td>
<td>Connector Rear panel, BNC-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Frequency 20 kHz to 50 MHz (for External Baseband Reference clock) 560 MHz to 800 MHz (for BB Ref Sync)</td>
</tr>
<tr>
<td></td>
<td>Input level ≥ 0.2 Vp-p, (Nominal) (AC coupling)</td>
</tr>
<tr>
<td>BB REF CLK Output</td>
<td>When MG3710A-017/117 is installed:</td>
</tr>
<tr>
<td></td>
<td>Connector Rear panel, BNC-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td></td>
<td>Frequency 560 MHz to 800 MHz</td>
</tr>
<tr>
<td></td>
<td>Output level 0.8 Vp-p, (Nominal) (AC coupling)</td>
</tr>
</tbody>
</table>
### Appendix A  Specifications

<Connector> Cont’d

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sweep Output</strong></td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>BNC-J at &lt; 1 Ω (driving capability of up to 2 kΩ) on the rear panel</td>
</tr>
<tr>
<td>Output level</td>
<td>0 to 10 V (while 10V level sweep is being executed), 0/5 V (when Sweep Status is selected)</td>
</tr>
<tr>
<td><strong>LO Input</strong></td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>Rear panel, SMA-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td>Frequency</td>
<td>98 MHz to 6 GHz</td>
</tr>
<tr>
<td>Input level</td>
<td>–10 dBm ≤ level ≤ +1 dBm (Nominal) (AC coupling)</td>
</tr>
<tr>
<td><strong>LO Output</strong></td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>Rear panel, SMA-J, 50 Ω (Nominal)</td>
</tr>
<tr>
<td>Frequency</td>
<td>98 MHz to 6 GHz</td>
</tr>
<tr>
<td>Output level</td>
<td>≤±1 dBm (Nominal) (AC coupling) (Internal Lo output)</td>
</tr>
<tr>
<td><strong>Additional Analog Modulation Input</strong></td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>Rear panel, BNC-J</td>
</tr>
<tr>
<td>Input impedance</td>
<td>50 Ω, 600 Ω, or Hi-Z (100 kΩ/70 pF) (Nominal)</td>
</tr>
<tr>
<td>Input level</td>
<td>For set value, 2 Vp-p (Nominal)</td>
</tr>
<tr>
<td><strong>Remote control</strong></td>
<td></td>
</tr>
<tr>
<td>Remote control</td>
<td>Remote control functions from an external controller (excluding the power supply)</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>Ethernet (10/100/1000 Base-T)</td>
</tr>
<tr>
<td><strong>GPIB</strong></td>
<td>Compatible with IEEE488.2</td>
</tr>
<tr>
<td>Interface function</td>
<td>SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E2</td>
</tr>
<tr>
<td><strong>USB (B)</strong></td>
<td>Compatible with USB2.0</td>
</tr>
<tr>
<td>Connector</td>
<td>Rear panel. USB-B Connector</td>
</tr>
<tr>
<td><strong>USB</strong></td>
<td>Compatible with USB2.0</td>
</tr>
<tr>
<td>Waveform hardcopy and parameter saving of this equipment onto USB compatible external devices are available.</td>
<td></td>
</tr>
<tr>
<td>Connector</td>
<td>Two ports of USB-A Connector on each of front panel and rear panel.</td>
</tr>
<tr>
<td><strong>Monitor Output</strong></td>
<td>VGA compatible mini D-SUB 15 pin on the rear panel</td>
</tr>
<tr>
<td><strong>AUX</strong></td>
<td>Used for input/output of an auxiliary device when MG3710A/MG3740A-017/117 is installed.</td>
</tr>
<tr>
<td>Connector</td>
<td>Rear panel, 50 pins (DX10A-50S equivalent part)</td>
</tr>
<tr>
<td>Input/Output level</td>
<td>TTL</td>
</tr>
</tbody>
</table>
<Display>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>XGA color LCD (resolution 1024 × 768)\n8.4 inches (213 mm)</td>
</tr>
</tbody>
</table>

<General specification>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions and mass</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>177 mm (h) × 426 mm (w) × 390 mm (d) (excluding protrusions)</td>
</tr>
<tr>
<td>Mass</td>
<td>≤13.7 kg (with MS3710A/MG3740A-032,034 or 036 installed; excludes all other options)</td>
</tr>
<tr>
<td></td>
<td>≤17 kg (with all options installed: MG3710A-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)</td>
</tr>
<tr>
<td>Power supply</td>
<td></td>
</tr>
<tr>
<td>Rated power voltage</td>
<td>AC 100 V to 120 V or 200 V to 240 V *</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50 to 60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤350 VA (Including all options)</td>
</tr>
<tr>
<td></td>
<td>180VA (Nominal) (Including the following options but excluding other options: MG3710A/MG3740A-032, 034 or 036, and 041 )</td>
</tr>
<tr>
<td></td>
<td>260VA (Nominal) (Including the following options but excluding other options: MG3710A/MG3740A-032, 034 or 036, 041, and 042; and MG3710A/MG3740A-062, 064 or 066, 071, and 072)</td>
</tr>
<tr>
<td></td>
<td>280VA (Nominal) (Including the following options but excluding other options: MG3710A/MG3740A-032, 034 or 036, 041, and 042; MG3710A-062/MG3740A, 064 or 066, 071, and 072; and 001, 021)</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>5 to 45°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>≤-20 to 60°C</td>
</tr>
</tbody>
</table>

*: Operating voltage: within the range of +10% to –15% from the rated voltage
## Environment performance

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted interference</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Radiated interference</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Harmonic current emission</td>
<td>Conforms to EN 61000-3-2</td>
</tr>
<tr>
<td>Electrostatic Discharge</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Electromagnetic immunity</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>First transient/burst</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Surge</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>RF Conductive Immunity</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Power Frequency Magnetic Field Immunity</td>
<td>Conforms to EN 61326-1</td>
</tr>
<tr>
<td>Voltage drop / power supply interruption</td>
<td>Conforms to EN 61326-1</td>
</tr>
</tbody>
</table>
### A.2 Options

#### <Option 001 Rubidium Reference Oscillator /  
Option 101 Rubidium Reference Oscillator Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Model/Symbol | MG3710A-001, MG3740A-001  
Rubidium Reference Oscillator  
MG3710A-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. |

#### <Option 002 High Stability Reference Oscillator /  
Option 102 High Stability Reference Oscillator Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Model/Symbol | MG3710A-002, MG3740A-002  
High Stability Reference Oscillator  
MG3710A-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. |

#### <Option 011 2ndary HDD /Option 111 2ndary HDD Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Model/Symbol | MG3710A-011, MG3740A-011  
2ndary HDD  
MG3710A-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>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-017, MG3740A-017</td>
</tr>
<tr>
<td></td>
<td>Universal Input/Output</td>
</tr>
<tr>
<td></td>
<td>MG3710A-117, MG3740A-117</td>
</tr>
<tr>
<td></td>
<td>Universal Input/Output Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies the following interfaces.</td>
</tr>
<tr>
<td></td>
<td>MG3710A:</td>
</tr>
<tr>
<td></td>
<td>The interface for local signal synchronization to</td>
</tr>
<tr>
<td></td>
<td>realize MIMO function</td>
</tr>
<tr>
<td></td>
<td>Sweep Out signal</td>
</tr>
<tr>
<td></td>
<td>AUX-BNC conversion cable.</td>
</tr>
<tr>
<td></td>
<td>MG3740A:</td>
</tr>
<tr>
<td></td>
<td>Sweep Out signal</td>
</tr>
<tr>
<td></td>
<td>AUX-BNC conversion cable.</td>
</tr>
</tbody>
</table>

<Option 018 Analog IQ Input/Output /Option 118 Analog IQ Input/Output Retrofit>

*Note:* This option cannot be installed in MG3740A.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-018</td>
</tr>
<tr>
<td></td>
<td>Analog IQ Input/Output</td>
</tr>
<tr>
<td></td>
<td>MG3710A-118</td>
</tr>
<tr>
<td></td>
<td>Analog IQ Input/Output Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the analog I/Q input/output function.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;IQ Input/Output&gt;, IQ input, IQ output for</td>
</tr>
<tr>
<td></td>
<td>details.</td>
</tr>
</tbody>
</table>

<Option 020 Digital Modulation /Option 120 Digital Modulation Retrofit>

*Note:* This option cannot be installed in MG3710A.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3740A-020</td>
</tr>
<tr>
<td></td>
<td>Digital Modulation</td>
</tr>
<tr>
<td></td>
<td>MG3740A-120</td>
</tr>
<tr>
<td></td>
<td>Digital Modulation Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the digital modulation function to the analog</td>
</tr>
<tr>
<td></td>
<td>signal generator.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Vector modulation&gt; for details.</td>
</tr>
</tbody>
</table>
**<Option 021 BER Test Function /Option 121 BER Test Function Retrofit>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-021, MG3740A-021</td>
</tr>
<tr>
<td></td>
<td>BER Test Function</td>
</tr>
<tr>
<td></td>
<td>MG3710A-121, MG3740A-121</td>
</tr>
<tr>
<td></td>
<td>BER Test Function Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the BER measurement function.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;BER measurement function&gt; for details.</td>
</tr>
</tbody>
</table>

**<Option 029 OS Upgrade to Windows 7>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-029, MG3740A-029</td>
</tr>
<tr>
<td></td>
<td>OS Upgrade to Windows 7</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Upgrades OS to Windows 7 Professional.</td>
</tr>
<tr>
<td></td>
<td>According to the license restriction, this product is available only as a factory option.</td>
</tr>
</tbody>
</table>

**<Option 032 1st RF 100 kHz to 2.7 GHz>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-032, MG3740A-032</td>
</tr>
<tr>
<td></td>
<td>1st RF 100kHz to 2.7GHz</td>
</tr>
<tr>
<td></td>
<td>This option cannot be retrofitted.</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 1st RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>

**<Option 034 1st RF 100 kHz to 4 GHz>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-034, MG3740A-034</td>
</tr>
<tr>
<td></td>
<td>1st RF 100kHz to 4GHz</td>
</tr>
<tr>
<td></td>
<td>This option cannot be retrofitted.</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 1st RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>

**<Option 036 1st RF 100 kHz to 6 GHz>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-036, MG3740A-036</td>
</tr>
<tr>
<td></td>
<td>1st RF 100kHz to 6GHz</td>
</tr>
<tr>
<td></td>
<td>This option cannot be retrofitted.</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 1st RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>
### <Option 041 High Power Extension for 1st RF / Option 141 High Power Extension for 1st RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-041, MG3740A-041 High Power Extension for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-141, MG3740A-141 High Power Extension for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Extends the maximum 1st RF output level. Refer to &lt;Output level&gt; for details.</td>
</tr>
</tbody>
</table>

### <Option 042 Low Power Extension for 1st RF / Option 142 Low Power Extension for 1st RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-042, MG3740A-042 Low Power Extension for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-142, MG3740A-142 Low Power Extension for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Extends the minimum 1st RF output level. Refer to &lt;Output level&gt; for details.</td>
</tr>
</tbody>
</table>

### <Option 043 Reverse Power Protection for 1st RF / Option 143 Reverse Power Protection for 1st RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-043, MG3740A-043 Reverse Power Protection for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-143, MG3740A-143 Reverse Power Protection for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Protects 1st RF from damage due to reverse power input. Refer to &lt;Maximum reverse input&gt; for details.</td>
</tr>
</tbody>
</table>

### <Option 045 ARB Memory Upgrade 256 Msample for 1st RF / Option 145 ARB Memory Upgrade 256 Msample for 1st RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-045, MG3740A-045 ARB Memory Upgrade 256 Msample for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-145, MG3740A-145 ARB Memory Upgrade 256 Msample for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Expands the ARB memory capacity of 1st RF to 256 M. Refer to &lt;Arbitrary waveform generator&gt;, Waveform memory for details.</td>
</tr>
</tbody>
</table>
Appendix A  Specifications

<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.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-046 ARB Memory Upgrade 1024 Msample for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-146 ARB Memory Upgrade 1024 Msample for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Expands the ARB memory capacity of 1st RF to 1024 M.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Arbitrary waveform generator&gt;, Waveform memory for details.</td>
</tr>
</tbody>
</table>

<Option 048 Combination of Baseband Signal for 1st RF /
Option 148 Combination of Baseband Signal for 1st RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-048, MG3740A-048 Combination of Baseband Signal for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-148, MG3740A-148 Combination of Baseband Signal for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the memory synthesizing function for synthesizing signals in the 1st RF baseband.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Arbitrary waveform generator&gt;, Waveform memory for details.</td>
</tr>
</tbody>
</table>

<Option 049 AWGN for 1st RF /Option 149 AWGN for 1st RF Retrofit>

Note:
This option cannot be installed in MG3740A.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-049 AWGN for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-149 AWGN for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the AWGN function to the 1st RF.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;AWGN generating function&gt; for details.</td>
</tr>
</tbody>
</table>
### Appendix A Specifications

#### Option 050 Additional Analog Modulation Input for 1st RF / Option 150 Additional Analog Modulation Input for 1st RF Retrofit

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-050, MG3740A-050</td>
</tr>
<tr>
<td></td>
<td>Additional Analog Modulation Input for 1st RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-150, MG3740A-150</td>
</tr>
<tr>
<td></td>
<td>Additional Analog Modulation Input for 1st RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the additional analog modulation function for 1st RF.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Analog modulation&gt;, External modulation signal for details.</td>
</tr>
</tbody>
</table>

#### Option 062 2nd RF 100kHz to 2.7GHz / Option 162 2nd RF 100kHz to 2.7GHz Retrofit

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-062, MG3740A-062</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 2.7GHz</td>
</tr>
<tr>
<td></td>
<td>MG3710A-162, MG3740A-162</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 2.7GHz Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 2nd RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>

#### Option 064 2nd RF 100kHz to 4GHz / Option 164 2nd RF 100kHz to 4GHz Retrofit

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-064, MG3740A-064</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 4GHz</td>
</tr>
<tr>
<td></td>
<td>MG3710A-164, MG3740A-164</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 4GHz Retrofit</td>
</tr>
<tr>
<td></td>
<td>This option can be retrofitted only when 2nd RF is not installed.</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 2nd RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>

#### Option 066 2nd RF 100kHz to 6GHz / Option 166 2nd RF 100kHz to 6GHz Retrofit

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-066, MG3740A-066</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 6GHz</td>
</tr>
<tr>
<td></td>
<td>MG3710A-166, MG3740A-166</td>
</tr>
<tr>
<td></td>
<td>2nd RF 100kHz to 6GHz Retrofit</td>
</tr>
<tr>
<td></td>
<td>This option can be retrofitted only when 2nd RF is not installed.</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Supplies a specific 2nd RF frequency range.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Frequency&gt; for details.</td>
</tr>
</tbody>
</table>
### <Option 071 High Power Extension for 2nd RF / Option 171 High Power Extension for 2nd RF Retrofit>

**Model/Symbol**
- MG3710A-071, MG3740A-071
- MG3710A-171, MG3740A-171

**Intended Use**
- Extends the maximum 2nd RF output level.
- Refer to <Output level> for details.

### <Option 072 Low Power Extension for 2nd RF / Option 172 Low Power Extension for 2nd RF Retrofit>

**Model/Symbol**
- MG3710A-072, MG3740A-072
- MG3710A-172, MG3740A-172

**Intended Use**
- Extends the minimum 2nd RF output level.
- Refer to <Output level> for details.

### <Option 073 Reverse Power Protection for 2nd RF / Option 173 Reverse Power Protection for 2nd RF Retrofit>

**Model/Symbol**
- MG3710A-073, MG3740A-073
- MG3710A-173, MG3740A-173

**Intended Use**
- Protects 2nd RF from damage due to reverse power input.
- Refer to <Maximum reverse input> for details.

### <Option 075 ARB Memory Upgrade 256 Msample for 2nd RF / Option 175 ARB Memory Upgrade 256 Msample for 2nd RF Retrofit>

**Model/Symbol**
- MG3710A-075, MG3740A-075
- MG3710A-175, MG3740A-175

**Intended Use**
- Expands the ARB memory capacity of 2nd RF to 256 M.
- Refer to <Arbitrary waveform generator>, Waveform memory for details.
### Appendix A Specifications

**<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.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-076, ARB Memory Upgrade 1024 Msample for 2nd RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-176, ARB Memory Upgrade 1024 Msample for 2nd RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Expands the ARB memory capacity of 2nd RF to 1024 M.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Arbitrary waveform generator&gt;, Waveform memory for details.</td>
</tr>
</tbody>
</table>

**<Option 078 Combination of Baseband Signal for 2nd RF / Option 178 Combination of Baseband Signal for 2nd RF Retrofit>**

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-078, MG3740A-078, Combination of Baseband Signal for 2nd RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-178, MG3740A-178, Combination of Baseband Signal for 2nd RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the memory synthesizing function for synthesizing signals in the 2nd RF baseband.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Arbitrary waveform generator&gt;, Waveform memory for details.</td>
</tr>
</tbody>
</table>

**<Option 079 AWGN for 2nd RF /Option 179 AWGN for 2nd RF Retrofit>**

*Note:*
This option cannot be installed in MG3740A.

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-079, MG3710A-179, AWGN for 2nd RF</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the AWGN function to the 2nd RF.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;AWGN generating function&gt; for details.</td>
</tr>
</tbody>
</table>
### <Option 080 Additional Analog Modulation Input for 2nd RF / Option 180 Additional Analog Modulation Input for 2nd RF Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-080, MG3740A-080 Additional Analog Modulation Input for 2nd RF</td>
</tr>
<tr>
<td></td>
<td>MG3710A-180, MG3740A-180 Additional Analog Modulation Input for 2nd RF Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Adds the additional analog modulation function for 2nd RF.</td>
</tr>
<tr>
<td></td>
<td>Refer to &lt;Analog modulation&gt;, External modulation signal for details.</td>
</tr>
</tbody>
</table>

### <Option 181 CPU/Windows7 Upgrade Retrofit>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-181, MG3740A-181 CPU/Windows7 Upgrade Retrofit</td>
</tr>
<tr>
<td>Intended Use</td>
<td>Upgrades the COM-Express module and changes the OS to Windows Embedded Standard 7 (WES7) (64-bit).</td>
</tr>
</tbody>
</table>

### <Option 313 Removable HDD>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model/Symbol</td>
<td>MG3710A-313, MG3740A-313 Removable HDD</td>
</tr>
<tr>
<td>Intended Use</td>
<td>A HDD as an additional main storage medium (including OS)</td>
</tr>
<tr>
<td></td>
<td>Users should attach or detach their HDD by themselves.</td>
</tr>
</tbody>
</table>
Appendix B  Error Messages

B.1  Error Messages List.................................................... B-2
<table>
<thead>
<tr>
<th>ID</th>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>Operation is canceled</td>
<td>—</td>
</tr>
<tr>
<td>-100</td>
<td>Command error</td>
<td>Failed to analyze command syntax.</td>
</tr>
<tr>
<td>-108</td>
<td>Parameter not allowed</td>
<td>Received more-than-required number of parameters for header.</td>
</tr>
<tr>
<td>-109</td>
<td>Missing parameter</td>
<td>Received less-than-required number of parameters for header.</td>
</tr>
<tr>
<td>-113</td>
<td>Undefined header</td>
<td>Undefined program header.</td>
</tr>
<tr>
<td>-120</td>
<td>Numeric data error</td>
<td>Failed to analyze numeric data syntax.</td>
</tr>
<tr>
<td>-120</td>
<td>Character data error</td>
<td>Failed to analyze character data syntax.</td>
</tr>
<tr>
<td>-130</td>
<td>Suffix error</td>
<td>Failed to analyze suffix syntax.</td>
</tr>
<tr>
<td>-150</td>
<td>String data error</td>
<td>Failed to analyze string data syntax.</td>
</tr>
<tr>
<td>-160</td>
<td>Block data error</td>
<td>Failed to analyze block data syntax.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Aborted execution due to file access failure.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Failed to save. Number of files to be saved reached upper limit.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>No selectable waveform pattern in waveform memory.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>License error</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>License Version error</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Waveform Pattern File not found.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Operation disabled because Long pattern is included.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Long pattern cannot be used for the current option configuration.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Operation disabled when Pattern Combination is Edit.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>I/Q Calibration failed.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Cannot load waveform.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Only supported when Sweep or List function is being executed.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The number of waveform on memory A reached upper limit.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The number of waveform on memory B reached upper limit.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The number of Long pattern on memory reached upper limit.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>There is insufficient space on memory A.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>There is insufficient space on memory B.</td>
</tr>
<tr>
<td>ID</td>
<td>Message</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>There is insufficient space on memory to load Long pattern.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The waveform already exists on memory A.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The waveform already exists on memory B.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>The same Long pattern already exists on memory.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Cannot load with current condition.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Operation forbidden as long as the current function is being executed.</td>
</tr>
<tr>
<td>-200</td>
<td>Execution error</td>
<td>Option composition of parameter file is not the same.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Setting not supported for 1st SG.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Setting not supported for 2nd SG.</td>
</tr>
<tr>
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<td>Settings conflict</td>
<td>Operation disabled when SG type is Analog.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when I/Q Output is Analog I/Q Out.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when I/Q Source is Digital I/Q In.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Modulation Source is Ext.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Modulation Source is Int.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Output Frequency is under 7MHz.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sequence Mode is being executed.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sweep/List is being executed.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when High S/N is On.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled with current level setting. Increase level to turn on this function.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Channel A is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Channel B is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SyncWithSG is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when no channel group is loaded to channel table.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Frequency Type differs between SG1 and SG2.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when FreqType is Channel.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when AttHold is On.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SyncWithSG is On.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when LO Source is not Internal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SG2 LO Source is Sync.</td>
</tr>
<tr>
<td>ID</td>
<td>Message</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------</td>
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</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation restricted by Multi SG Sync.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pattern Combination is Edit.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Digital Modulation (Opt-020) not installed.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Parameter out of range or invalid: [Comment]Line</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Parameter out of range or invalid: [Header]Product Name</td>
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<td>-221</td>
<td>Settings conflict</td>
<td>Parameter out of range or invalid: [Wave Info]Data Width</td>
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<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Combination Pattern File or Alias Pattern File not selected.</td>
</tr>
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<td>Settings conflict</td>
<td>Operation disabled when Pattern B is not selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pattern A is not selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when both Pattern A and B is not selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Off not set for Sync Type.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sync Type is Slave.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when External not set for Baseband Reference Clock Source.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker1 Edit Mode A is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker2 Edit Mode A is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker3 Edit Mode A is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker1 Edit Mode A.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker2 Edit Mode A.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker3 Edit Mode A.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when RF Gate Edit Mode is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for RF Gate Edit Mode.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Play Mode is Auto for Sequence Mode.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sequence Mode is not being executed.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled because Master or Slave not set for Sync Type.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Slave not set for Sync Type.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sync Type is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Waveform Pattern is not included in output signal.</td>
</tr>
<tr>
<td>ID</td>
<td>Message</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sequence Pattern File is selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Carrier is not included in output signal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Carrier is included in output signal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker1 Edit Mode B is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker2 Edit Mode B is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Marker3 Edit Mode B is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker1 Edit Mode B.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker2 Edit Mode B.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when On not set for Marker3 Edit Mode B.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pattern A and B is not included in output signal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled with currently selected Waveform Pattern File.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Combination Pattern File or Alias Pattern File not selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Waveform of List function is On when List function in use.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Rate Matching is used.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when RfGateType is Single.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Start/Frame Trigger is Off.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Start/Frame Trigger Mode is Start.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when 3Trigger not set for Pattern Trigger Mode.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pattern Trigger Mode is 3Status.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when outputting Pattern A and B addition signal or Multiplex signal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Center Signal is Baseband DC.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Baseband DC not set for Center Signal.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Long pattern is loaded.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Mod is On.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SG1 output signal is CW.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SG2 output signal is CW.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Invalid waveform type</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Invalid waveform file information</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Same combination file has been loaded.</td>
</tr>
<tr>
<td>ID</td>
<td>Message</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Cannot find waveform A specified with combination.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Cannot find waveform B specified with combination.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Invalid waveform A file information</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Invalid waveform B file information</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>The number of combination file reached upper limit.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Cannot load new waveform when Long waveform is already loaded.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Cannot load new Long waveform when more than one waveform is already loaded.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when AM Type is Exp.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when AM Type is Lin.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Freerun or Gated not set for Pulse Source.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pulse Source is Square or Ext Pulse.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Pulse Source is Square, Freerun, Gated, or Ext Pulse.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Adjustable Doublet not set for Pulse Source.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when I/Q Source is Analog I/Q In.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when SG output signals are not modulated.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when Sequence Pattern File is selected.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled in Manual Mode.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Operation disabled when using 2nd SG and in Sweep mode.</td>
</tr>
<tr>
<td>-221</td>
<td>Settings conflict</td>
<td>Specified function not supported at current state.</td>
</tr>
<tr>
<td>ID</td>
<td>Message</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>-222</td>
<td>Data out of range</td>
<td>Setting value out of range</td>
</tr>
<tr>
<td>-240</td>
<td>Hardware error</td>
<td>Failed to communicate with Power Sensor</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when both Option 018 and Option 019 not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Digital BB I/Q Unit (Opt-019) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when 2nd SG (Opt-062, 064, 066) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Reverse Power Protection for 1st RF (Opt-043) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Reverse Power Protection for 2nd RF (Opt-073) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Option 048 not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Option 078 not installed.</td>
</tr>
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<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Universal Input/Output (Opt-017) not installed.</td>
</tr>
<tr>
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<td>Hardware missing</td>
<td>Operation disabled when AWGN (Opt-049) not installed.</td>
</tr>
<tr>
<td>-241</td>
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<td>Operation disabled when AWGN (Opt-079) not installed.</td>
</tr>
<tr>
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<td>Hardware missing</td>
<td>Operation disabled when 2nd HDD (Opt-011) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when Analog I/Q Input/Output (Opt-018) not installed.</td>
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<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when 1st SG (Opt-050) not installed.</td>
</tr>
<tr>
<td>-241</td>
<td>Hardware missing</td>
<td>Operation disabled when 2nd SG (Opt-080) not installed.</td>
</tr>
<tr>
<td>-256</td>
<td>File name not found</td>
<td>Unable to execute; specified file name not found in media.</td>
</tr>
<tr>
<td>-257</td>
<td>File name error</td>
<td>An invalid filename was encountered.</td>
</tr>
<tr>
<td>-350</td>
<td>Queue overflow</td>
<td>Remote control error queue overflowed.</td>
</tr>
</tbody>
</table>
Appendix C  Default Value List

The default values are common to SG Port 1 and 2, if not specified.

<System>

<table>
<thead>
<tr>
<th>Item</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG Port</td>
<td>SG1</td>
</tr>
</tbody>
</table>

<Frequency Functions>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Frequency setting</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>1 GHz</td>
</tr>
<tr>
<td>Frequency relative display On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Frequency relative display</td>
<td>0 Hz</td>
</tr>
<tr>
<td>Frequency offset On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Frequency offset</td>
<td>0 Hz</td>
</tr>
<tr>
<td>Frequency offset multiplier On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Frequency offset multiplier</td>
<td>1</td>
</tr>
<tr>
<td>Frequency step</td>
<td>100.00000 kHz</td>
</tr>
<tr>
<td>Channel setting</td>
<td></td>
</tr>
<tr>
<td>Frequency/Channel display</td>
<td>Freq</td>
</tr>
<tr>
<td>Frequency display On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Channel group</td>
<td>No Group</td>
</tr>
<tr>
<td>Channel selection</td>
<td>0</td>
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<tr>
<td>Function</td>
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<tr>
<td>Frequency synchronization On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Frequency synchronization mode</td>
<td>Parallel</td>
</tr>
<tr>
<td>Phase noise optimization</td>
<td>Offset &lt; 200 kHz</td>
</tr>
<tr>
<td>RF spectrum</td>
<td>Normal</td>
</tr>
<tr>
<td>Signal source</td>
<td></td>
</tr>
<tr>
<td>Reference frequency source</td>
<td>Auto</td>
</tr>
<tr>
<td>Reference frequency</td>
<td>10 MHz</td>
</tr>
<tr>
<td>Local signal source</td>
<td>Int</td>
</tr>
<tr>
<td>Local signal output</td>
<td>Off</td>
</tr>
<tr>
<td>Local signal phase</td>
<td>0.00 deg</td>
</tr>
</tbody>
</table>
### Default Value List

#### Output Level Main Function

<table>
<thead>
<tr>
<th>Item</th>
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</tr>
</thead>
<tbody>
<tr>
<td>RF output On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Output level</td>
<td>$-144.00 \text{ dBm}$</td>
</tr>
<tr>
<td>Display unit</td>
<td>dBm</td>
</tr>
<tr>
<td>Output level relative display On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Output level relative value</td>
<td>0 dB</td>
</tr>
<tr>
<td>Output level offset On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Output level offset</td>
<td>0.00 dB</td>
</tr>
<tr>
<td>Output level step</td>
<td>0.10 dB</td>
</tr>
<tr>
<td>Limit level On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Limit level</td>
<td>Maximum level of installed options</td>
</tr>
<tr>
<td>ATT Hold On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Output level synchronization On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>User correction On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>S/N optimization On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>User correction setting</td>
<td></td>
</tr>
<tr>
<td>Com Port</td>
<td>2</td>
</tr>
<tr>
<td>Model</td>
<td>MA24106A</td>
</tr>
<tr>
<td>Start Freq</td>
<td>1.000000000000 GHz</td>
</tr>
<tr>
<td>Stop Freq</td>
<td>1.000000000000 GHz</td>
</tr>
<tr>
<td>Level Offset On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Level Offset</td>
<td>0.00 dB</td>
</tr>
<tr>
<td>Correction Points</td>
<td>2</td>
</tr>
<tr>
<td>Averaging On/Off</td>
<td>Off</td>
</tr>
<tr>
<td>Averaging Count</td>
<td>10</td>
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### <Sweep/List Function>

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### Appendix C  Default Value List

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## Appendix C  Default Value List

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<td>Channel B On/Off</td>
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<td>Channel B Measurement Units</td>
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### Utility

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<td>Others</td>
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<td>Screen display On/Off</td>
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### <Save/Read Function>

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# Performance Test Result Form

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<th>Test person in charge</th>
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Equipment Name: MG3710A Vector Signal Generator / MG3740A Analog Signal Generator

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<table>
<thead>
<tr>
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<th>Relative humidity %</th>
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<tbody>
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</tbody>
</table>

Remarks:

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
## Output Frequency (Section 10.2.1)

### 1st RF

<table>
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<th>Setting</th>
<th>Results</th>
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<td>□ OK    □ NG</td>
</tr>
<tr>
<td>100 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>300 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>600 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>1000 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>1500 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>2000 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>2500 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>2700 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>3000 MHz</td>
<td>□ OK    □ NG</td>
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<tr>
<td>3500 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>4000 MHz</td>
<td>□ OK    □ NG</td>
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<tr>
<td>4500 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>5000 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>5500 MHz</td>
<td>□ OK    □ NG</td>
</tr>
<tr>
<td>6000 MHz</td>
<td>□ OK    □ NG</td>
</tr>
</tbody>
</table>

*: 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.
### 2nd RF

<table>
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<td>□ OK</td>
</tr>
<tr>
<td>100 MHz</td>
<td>□ OK</td>
</tr>
<tr>
<td>300 MHz</td>
<td>□ OK</td>
</tr>
<tr>
<td>600 MHz</td>
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<td>2700 MHz</td>
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*: 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.
## Output Level Frequency Characteristics (Section 10.3.1)

1st RF, without Option 043/143

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<th>Frequency</th>
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<th>Minimum Rating</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
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<tbody>
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<td>-5.5 dBm</td>
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<td>-4.5 dBm</td>
<td>±0.27 dB</td>
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<tr>
<td>97 MHz</td>
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</tr>
<tr>
<td>98 MHz</td>
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<td>-6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>100 MHz</td>
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<td></td>
<td>-6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>399 MHz</td>
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<td></td>
<td></td>
<td>-6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>400 MHz</td>
<td></td>
<td></td>
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<tr>
<td>500 MHz</td>
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<td>-6.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>1000 MHz</td>
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<td>3001 MHz</td>
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<tr>
<td>3500 MHz</td>
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<td>-6.3 dBm</td>
<td>±0.34 dB</td>
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<tr>
<td>4000 MHz</td>
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<td>±0.34 dB</td>
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<tr>
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*: 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.
## 2nd RF, without Option 073/173

<table>
<thead>
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<th>Minimum Rating</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
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<tr>
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<td>–5.5 dBm</td>
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<td>–4.5 dBm</td>
<td>±0.27 dB</td>
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</tr>
<tr>
<td>98 MHz</td>
<td>–7.5 dBm</td>
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<td></td>
<td>–6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>100 MHz</td>
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<td></td>
<td>–6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>399 MHz</td>
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<td></td>
<td>–6.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>400 MHz</td>
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<td>–6.5 dBm</td>
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</tr>
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<td>–6.2 dBm</td>
<td>±0.34 dB</td>
</tr>
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<td></td>
<td>–6.2 dBm</td>
<td>±0.34 dB</td>
</tr>
</tbody>
</table>

*: 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.
<table>
<thead>
<tr>
<th>Setting</th>
<th>Minimum Rating</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
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</thead>
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<tr>
<td>97 MHz</td>
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</tr>
<tr>
<td>98 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.27 dB</td>
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<tr>
<td>500 MHz</td>
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<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>1000 MHz</td>
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<td>2500 MHz</td>
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</tr>
<tr>
<td>3000 MHz</td>
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<td>4000 MHz</td>
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<td>–9.2 dBm</td>
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<tr>
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<td>–10.8 dBm</td>
<td></td>
<td>–9.2 dBm</td>
<td>±0.34 dB</td>
</tr>
<tr>
<td>6000 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: 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.
2nd RF, with Option 073/173

<table>
<thead>
<tr>
<th>Setting</th>
<th>Minimum Rating</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Output level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 MHz</td>
<td>–8 dBm</td>
<td></td>
<td>–7.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>97 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>98 MHz</td>
<td>–8.5 dBm</td>
<td></td>
<td>–7.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>100 MHz</td>
<td>–9 dBm</td>
<td></td>
<td>–8.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>399 MHz</td>
<td>–9.5 dBm</td>
<td></td>
<td>–8.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>400 MHz</td>
<td>–9.5 dBm</td>
<td></td>
<td>–8.5 dBm</td>
<td>±0.27 dB</td>
</tr>
<tr>
<td>500 MHz</td>
<td>–10 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>1000 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>1500 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>2000 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>2500 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>2700 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>3000 MHz</td>
<td>–10.5 dBm</td>
<td></td>
<td>–9.5 dBm</td>
<td>±0.25 dB</td>
</tr>
<tr>
<td>3001 MHz</td>
<td>–10.7 dBm</td>
<td></td>
<td>–9.3 dBm</td>
<td>±0.34 dB</td>
</tr>
<tr>
<td>3500 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4000 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4500 MHz</td>
<td>–10.8 dBm</td>
<td></td>
<td>–9.2 dBm</td>
<td>±0.34 dB</td>
</tr>
<tr>
<td>5000 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5500 MHz</td>
<td>–10.8 dBm</td>
<td></td>
<td>–9.2 dBm</td>
<td>±0.34 dB</td>
</tr>
<tr>
<td>6000 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: 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.
**Appendix D  Performance Test Report Form**

**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

<table>
<thead>
<tr>
<th>Setting</th>
<th>Frequency</th>
<th>Output level</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-CDMA</td>
<td>800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GSM</td>
<td>800 MHz</td>
<td>□ (1) +7 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td>□ (2) +13 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td>□ (3) +4 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td>□ (4) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDGE</td>
<td>800 MHz</td>
<td>□ (1) +7 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td>□ (2) +13 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td>□ (3) +4 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td>□ (4) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTE</td>
<td>600 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2400 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2700 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTE</td>
<td>3400 MHz</td>
<td>□ (1) +4 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3500 MHz</td>
<td>□ (2) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3600 MHz</td>
<td>□ (3) +1 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3700 MHz</td>
<td>□ (4) +7 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: Refer to the table below for output level.

<table>
<thead>
<tr>
<th>Output level</th>
<th>1st RF : 043/143</th>
<th>1st RF : 043/141</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Not installed</td>
<td>Not installed</td>
</tr>
<tr>
<td>(2)</td>
<td>Not installed</td>
<td>Installed</td>
</tr>
<tr>
<td>(3)</td>
<td>Installed</td>
<td>Not installed</td>
</tr>
<tr>
<td>(4)</td>
<td>Installed</td>
<td>Installed</td>
</tr>
</tbody>
</table>
### Appendix D Performance Test Report Form

#### 2nd RF

<table>
<thead>
<tr>
<th>System</th>
<th>Frequency</th>
<th>Output level</th>
<th>Results</th>
<th>Maximum Rating</th>
<th>Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W-CDMA</strong> (Test Model 4)</td>
<td>800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSM</strong></td>
<td>800 MHz</td>
<td>□ (1) +7 dBm</td>
<td></td>
<td>0.62% (rms)</td>
<td>0.02% (rms)</td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td>□ (2) +13 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td>□ (3) +4 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td>□ (4) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EDGE</strong></td>
<td>800 MHz</td>
<td>□ (1) +7 dBm</td>
<td></td>
<td>0.84° (rms)</td>
<td>0.04° (rms)</td>
</tr>
<tr>
<td></td>
<td>900 MHz</td>
<td>□ (2) +13 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1800 MHz</td>
<td>□ (3) +4 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1900 MHz</td>
<td>□ (4) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LTE (20 MHz TestModel 3.1)</strong></td>
<td>600 MHz</td>
<td></td>
<td></td>
<td>0.82% (rms)</td>
<td>0.02% (rms)</td>
</tr>
<tr>
<td></td>
<td>800 MHZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500 MHZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000 MHZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2400 MHZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2700 MHZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LTE (20 MHz TestModel 3.1)</strong></td>
<td>3400 MHz</td>
<td>□ (1) +4 dBm</td>
<td></td>
<td>0.82% (rms)</td>
<td>0.02% (rms)</td>
</tr>
<tr>
<td></td>
<td>3500 MHz</td>
<td>□ (2) +10 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3600 MHz</td>
<td>□ (3) +1 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3700 MHz</td>
<td>□ (4) +7 dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3800 MHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Refer to the table below for output level.

<table>
<thead>
<tr>
<th>Output level</th>
<th>1st RF : 043/143</th>
<th>1st RF : 041/141</th>
<th>2nd RF : 073/173</th>
<th>2nd RF : 071/171</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Not installed</td>
<td>Not installed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>Not installed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>Installed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>Installed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E  Remote Control

This chapter provides an overview of the remote control operation of the MG3710A/MG3740A.
Appendix E  Remote Control

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Automatic measurement can be performed in combination with an external controller (PC). The MG3710A/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

An overview of each interface is shown below:

(1) GPIB
The GPIB interface of the MG3710A/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

(2) Ethernet (1000BASE-T)
For the network connection, refer to 9.7.7 “Windows Security Measures”.
The Ethernet interface of the MG3710A/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/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/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/MG3740A.

Connect to GPIB, Ethernet or USB port

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/MG3740A and an external device using a GPIB cable.

**Note:**

Be sure to connect the GPIB cable before turning power on to the MG3710A/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/MG3740A. Be sure to abide by the conditions shown below when connecting devices.

![GPIB cable connection diagram](image)

- Total cable length: Up to 20 m
- Cable length between devices: Up to 4 m
- Number of devices that can be connected: Up to 15

**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/MG3740A and an external device. Use a network hub when connecting to multiple external devices.

![Sample connection with one external device](image1)

*Figure E.2.2-1  Sample connection with one external device*

![Sample connection with multiple external devices](image2)

*Figure E.2.2-2  Sample connection with multiple external devices*

**Note:**

External devices may experience difficulty in communicating with the MG3710A/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.

**Figure E.2.3-1  Sample connection with one external device**

**Figure E.2.3-2  Sample connection with multiple external devices**
E.3 Interface Settings

This section describes setting methods for the MG3710A/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

1. 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/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/MG3740A, the resource name should be described as follows:

   When IP Address = 172.168.0.1:
   TCP/IP::172.168.0.1::INSTR
<How to confirm and set IP address and subnet mask>
For Windows Embedded Standard 2009
1. 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.
For Windows 7 Professional or Windows Embedded Standard 7
1. 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.
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.
E.3.3 USB interface settings

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/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. On the front panel goes off in Local status and lights up in Remote status.

To change the interface, the MG3710A/MG3740A must enter Local status again. Press 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/MG3740A are shown in the table below.

<table>
<thead>
<tr>
<th>Table E.5-1 Initialization level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>Interface bus initialization</td>
</tr>
<tr>
<td>Message exchange initialization</td>
</tr>
<tr>
<td>• Input buffer and output queue</td>
</tr>
<tr>
<td>• Message processing and status</td>
</tr>
<tr>
<td>OPC status initialization</td>
</tr>
<tr>
<td>Event status initialization</td>
</tr>
<tr>
<td>Protected settings initialization</td>
</tr>
<tr>
<td>(Calibration values, Correction values, OS settings, application load/execution status, etc.)</td>
</tr>
<tr>
<td>Initialization of settings saved at power-off</td>
</tr>
<tr>
<td>Initialization of settings not saved at power-off (window status, measurement results, etc.)</td>
</tr>
</tbody>
</table>

*: Restores the settings from the last power-off.

(1) IFC (Interface Clear)
   - Reception of control 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/MG3740A

(4) *RST
   - Reception of *RST command (GPIB/Ethernet/USB)

(5) *CLS
   - Reception of *CLS command (GPIB/Ethernet/USB)
E.6 Language Mode

As a command to remotely control the MG3710A/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

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/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/MG3740A with a PRINT or any other statement is shown below.

```
PRINT @1;“MEAS:ACP?”
```

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; “CONF:ACP; READ:ACP?”

Multiple commands can be transmitted separately by separating them with semicolons (“;”).

Program message unit

Program header

Control header

Common command 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.
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 (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 plus (“+”) 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 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. 12) and character strings are unavailable.
- The plus (“+”) sign can be omitted (from both the mantissa and the exponent).

<Examples>
- \(-22.34E+6 \rightarrow -22.34 \times 10^6 (= -22,340,000)\)
- \(5.3e-4 \rightarrow 5.3 \times 10^{-4} (= 0.00053)\)
Hexadecimal data

Binary data
The table below lists the suffix data that is used in the MG3710A/MG3740A.
The suffix codes available vary depending on the function.

<table>
<thead>
<tr>
<th>Category</th>
<th>Suffix Code</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>GHZ or GZ</td>
<td>GHz</td>
</tr>
<tr>
<td></td>
<td>MHZ or MZ</td>
<td>MHz</td>
</tr>
<tr>
<td></td>
<td>KHZ or KZ</td>
<td>kHz</td>
</tr>
<tr>
<td></td>
<td>HZ</td>
<td>Hz</td>
</tr>
<tr>
<td>Level</td>
<td>DB</td>
<td>dB</td>
</tr>
<tr>
<td></td>
<td>DBM or DM</td>
<td>dBm</td>
</tr>
<tr>
<td></td>
<td>DBUV</td>
<td>dBμV</td>
</tr>
<tr>
<td></td>
<td>DBUVE</td>
<td>dBμV (emf)</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>MV</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>UV</td>
<td>μV</td>
</tr>
<tr>
<td>Time</td>
<td>S</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>MS</td>
<td>ms</td>
</tr>
<tr>
<td></td>
<td>US</td>
<td>μs</td>
</tr>
<tr>
<td></td>
<td>NS</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>PS</td>
<td>ps</td>
</tr>
<tr>
<td>Angle</td>
<td>DEG</td>
<td>degree</td>
</tr>
<tr>
<td>Percent</td>
<td>PCT</td>
<td>%</td>
</tr>
</tbody>
</table>
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/MG3740A by way of INPUT and other statements are described below.

A response message is composed of one or more response message units to one or more program queries issued with one PRINT statement.

Use a ‘:SYSTem:COMMunicate:GPIB[1][SELF]:DELimiter’ command to specify the terminator format.

Response unit has no header and only returns the data of the measurement data.
Response data

Character 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)

- 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
Appendix E  Remote Control

Hexadecimal data

Binary data

String response data

ASCII character other than a double quotation mark
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”.

```
SENSe ---- FREQuency ---- CENTer ---- <freq>
          |                    |        |
          |                    |        |
          |                    |        |
CENTer?  |
          |                    |        |
          |                    |        |
SPAN     ---- <freq>   |
          |        |
SPAN?    |
          |        |
```

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 > :SENSe:FREQuency:CENTer 1000000
long + short form > :SENSe:FREQuency: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?
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/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
```
```
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,:CALibration2
```

To control active SG:

Omit (if possible)

To activate SG, use the following command:
```
[:SOURce]:PORT 1|2
```
The commands for specifying frequencies are provided examples.

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

Example 1: To select 1 GHz for the frequency of SG1
SOUR1:FREQ:CW 1GHZ, or SOUR:FREQ:CW 1GHZ

Example 2: To select 2 GHz for the frequency of SG2
SOUR2:FREQ:CW 2GHZ

Example 3: To activate SG2 and select 3 GHz for the frequency of SG2
PORT 2
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/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/MG3740A with a PRINT or any other statement is shown below.

```
PRINT @1;"CNF 1GHZ"
```

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**

Multiple commands can be transmitted separately by separating them with semicolons (;).

**Program message unit**

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**

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 (_).

**Character program data**

- **<Examples>**
  - LOAD SIGANA
  - SOUND OFF
  - Loads the Signal Analyzer.
  - 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. 112) and character strings are unavailable.
- The “+” sign can be omitted (from both the mantissa and exponent).

<Examples>
- \(-22.34\times10^6 \rightarrow -22,340,000\)
- \(5.3\times10^{-4} \rightarrow 0.00053\)
E.8 Native Device Message Details

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>
<thead>
<tr>
<th>Category</th>
<th>Suffix Code</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>GHZ or GZ</td>
<td>GHz</td>
</tr>
<tr>
<td></td>
<td>MHZ or MZ</td>
<td>MHz</td>
</tr>
<tr>
<td></td>
<td>KHZ or KZ</td>
<td>kHz</td>
</tr>
<tr>
<td></td>
<td>HZ</td>
<td>Hz</td>
</tr>
<tr>
<td>Level</td>
<td>DB</td>
<td>dB</td>
</tr>
<tr>
<td></td>
<td>DBM or DM</td>
<td>dBm</td>
</tr>
<tr>
<td></td>
<td>DBUV</td>
<td>dBµV</td>
</tr>
<tr>
<td></td>
<td>DBUVEMF</td>
<td>dBµV (emf)</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>MV</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>UV</td>
<td>µV</td>
</tr>
<tr>
<td></td>
<td>DBUV</td>
<td>dBµV</td>
</tr>
<tr>
<td></td>
<td>DBUVE</td>
<td>dBµV (emf)</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>MV</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>UV</td>
<td>µV</td>
</tr>
<tr>
<td>Time</td>
<td>S</td>
<td>s</td>
</tr>
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<td></td>
<td>MS</td>
<td>ms</td>
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<tr>
<td></td>
<td>US</td>
<td>µs</td>
</tr>
<tr>
<td></td>
<td>NS</td>
<td>ns</td>
</tr>
<tr>
<td>Angle</td>
<td>DEG</td>
<td>degree</td>
</tr>
<tr>
<td>Percent</td>
<td>PCT</td>
<td>%</td>
</tr>
</tbody>
</table>
E.8 Native Device Message Details

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/MG3740A by way of INPUT and other statements are described below.

A response message is composed of one or more response message units to one or more program queries issued with one PRINT statement.

Use a TRM command to specify the terminator format.
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/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
```
Appendix E  Remote Control

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

<table>
<thead>
<tr>
<th>Register model</th>
<th>Queue model</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Standard Event Status Register</th>
<th>Status Byte Register</th>
<th>Output Queue</th>
</tr>
</thead>
<tbody>
<tr>
<td>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: <strong>&lt;1&gt;</strong> power-on, <strong>&lt;2&gt;</strong> user request, <strong>&lt;3&gt;</strong> command error, <strong>&lt;4&gt;</strong> execution error, <strong>&lt;5&gt;</strong> device-dependent error, <strong>&lt;6&gt;</strong> query error, <strong>&lt;7&gt;</strong> bus control request, and <strong>&lt;8&gt;</strong> operation complete. Bit6 (DIO6) of the Status Byte Register works as an OR output bit to report an Event Summary Bit (ESB) summary message.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

![Status Byte Register Diagram](image)

*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/MG3740A, and also both EESB1 and EESB0 correspond to that of the sub-application (SG2) of the MG3710A/MG3740A.

![Figure E.9.4-1 Status byte register in Native mode](image)
E.9 Status Structure

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)
Read from SRE register

The SRE register is read using an *SRE? common query. A response message to this query is given as an integer between 0 and 255, equaling the sum of the values of the SRE register bits.

Update SRE register

The SRE register is written to using an *SRE common command with an integer between 0 and 255 as a parameter and with the SRE register bits being set to 0 or 1. The value of bit6 is ignored.
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.

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.

<table>
<thead>
<tr>
<th>bit</th>
<th>Event name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Power on (PON)</td>
<td>Power transition from Off to On</td>
</tr>
<tr>
<td>6</td>
<td>User Request</td>
<td>Transition from Remote to Local</td>
</tr>
<tr>
<td>5</td>
<td>Command error (CME)</td>
<td>Device message with illegal header received</td>
</tr>
<tr>
<td>4</td>
<td>Execution error (EXE)</td>
<td>Device message with illegal parameter received or the executed function has not completed normally</td>
</tr>
<tr>
<td>3</td>
<td>Device-dependent error (DDE)</td>
<td>Error caused by a condition other than CME, EXE, and QYE</td>
</tr>
<tr>
<td>2</td>
<td>Query error (QYE)</td>
<td>Attempt to read data from the output queue when it is empty or queued data lost before it is read</td>
</tr>
<tr>
<td>1</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Operation complete (OPC)</td>
<td>Set to 1 when the MG3710A/MG3740A has processed the *OPC command.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Register</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Event Status register</td>
<td>Read: This register is read using an *ESR? common query.</td>
</tr>
<tr>
<td></td>
<td>Write: This register cannot be written externally.</td>
</tr>
<tr>
<td></td>
<td>Clear: This register is cleared when:</td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; The *CLS command is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on (bit7 is turned on, with all other bits being cleared to 0).</td>
</tr>
<tr>
<td></td>
<td>&lt;3&gt; An event is read in response to an *ESR? query command.</td>
</tr>
<tr>
<td>Standard Event Status Enable register</td>
<td>Read: This register is read using an *ESE? common query.</td>
</tr>
<tr>
<td></td>
<td>Write: This register is written to using an *ESE common command.</td>
</tr>
<tr>
<td></td>
<td>Clear: This register is cleared when:</td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; An *ESE command with a data value of 0 is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Register-Filter</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUEStionable Status register</td>
<td>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/MG3740A.</td>
</tr>
<tr>
<td>OPERation Status register</td>
<td>Reports some of the statuses of MG3710A/MG3740A.</td>
</tr>
</tbody>
</table>
The SCPI specification status register has the following configuration.

Figure E.9.9-1  Configuration of SCPI Specification Status Register

Table E.9.9-2  SCPI Specification Status register configurations

<table>
<thead>
<tr>
<th>Register-Filter</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition Register</td>
<td>Monitors device status and changes depending on the device status. Therefore, this register does not store the status.</td>
</tr>
<tr>
<td>Transition Filter</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>(1) Positive direction change</td>
</tr>
<tr>
<td></td>
<td>The event becomes true only when the corresponding condition changes false into true.</td>
</tr>
<tr>
<td></td>
<td>(2) Negative direction change</td>
</tr>
<tr>
<td></td>
<td>The event becomes true only when the corresponding condition changes from true into false.</td>
</tr>
<tr>
<td></td>
<td>(3) Both direction change</td>
</tr>
<tr>
<td></td>
<td>The event becomes true when a change in either the positive or negative direction is present.</td>
</tr>
<tr>
<td>Event Register</td>
<td>Stores the output of transition filter.</td>
</tr>
<tr>
<td>Event Enable Register</td>
<td>Selects which bit of the corresponding event register is used to set the summary message to true when set to 1.</td>
</tr>
</tbody>
</table>
E.9.10 SCPI specification status register operation

How to operate the SCPI specification status register and error/event queue is shown below.

**Table E.9.10-1  SCPI Status register operation**

<table>
<thead>
<tr>
<th>Register</th>
<th>Operation</th>
</tr>
</thead>
</table>
| **SCPI event register (Main Application)** | **Read** :STATus:...:EVENt?  
This register is read using a query. |
| **Write** | This register cannot be written externally. |
| **Clear** | This register is cleared when:  
(1) *CLS command is received.  
(2) The power is On.  
(3) An event is read in response to :STATus:...:EVENt? Query command.  
(4) A language mode is switched. |
| **SCPI enable register (Main Application)** | **Read** :STATus:...:ENABle?  
This register is read by using an query. |
| **Write** | :STATus:...:ENABle  
This register is written by using a command. |
| **Clear** | This register is cleared when:  
(1) :STATus:PRESet command is received.  
(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 (Cont’d)

<table>
<thead>
<tr>
<th>Register</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCPI Transition Filter (Main Application)</td>
<td>Read</td>
</tr>
<tr>
<td>:STATus:...:PTRansition?</td>
<td>This register is read using a query.</td>
</tr>
<tr>
<td>:STATus:...:NTRansition?</td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td></td>
</tr>
<tr>
<td>:STATus:...:PTRansition</td>
<td>This register is written using a command.</td>
</tr>
<tr>
<td>:STATus:...:NTRansition</td>
<td></td>
</tr>
<tr>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>This register is cleared when:</td>
<td></td>
</tr>
<tr>
<td>(1) :STATus:PRESet command is received.</td>
<td></td>
</tr>
<tr>
<td>(2) The power is on.</td>
<td></td>
</tr>
<tr>
<td>(3) :STATus:...:PTRansition 0 command is received.</td>
<td></td>
</tr>
<tr>
<td>(4) A language mode is switched.</td>
<td></td>
</tr>
</tbody>
</table>

| Error/Event Queue (Main Application) | Read |
| :SYSTem:ERRor? | This register is read using a query. |
| Write | This register cannot be written externally. |
| Clear |
| This register is cleared when: |
| (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. |

The values after the register and filter influenced by :STATus:PRESet have been reset are shown in the following table.

Table E.9.10-2  Values after the register and filter influenced by :STATus:PRESet have been reset.

<table>
<thead>
<tr>
<th>Register</th>
<th>Enable Filter</th>
<th>Reset Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERational Status Register</td>
<td>Enable Register</td>
<td>All 0</td>
</tr>
<tr>
<td>QUESTionable Status Register</td>
<td>PTRansition Filter</td>
<td>All 1</td>
</tr>
<tr>
<td></td>
<td>NTRansition Filter</td>
<td>All 0</td>
</tr>
</tbody>
</table>
E.9.11 Extended Event Status register

When the language mode is Native, the application running on the MG3710A/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/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.

![Diagram of Extended Error Event Status register (Main Application)](image)

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.

![Diagram of Extended Error Event Status register](image)

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.

<table>
<thead>
<tr>
<th>Register</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extended Error Event Status Register</strong></td>
<td></td>
</tr>
<tr>
<td>Main Application</td>
<td><strong>Read</strong> This register is read using an ESR3? query.</td>
</tr>
<tr>
<td></td>
<td><strong>Write</strong> This register cannot be written externally.</td>
</tr>
<tr>
<td><strong>Clear</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; The *CLS command is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on.</td>
</tr>
<tr>
<td></td>
<td>&lt;3&gt; An event is read in response to an ESR3? query command.</td>
</tr>
<tr>
<td></td>
<td>&lt;4&gt; When the language mode has been switched.</td>
</tr>
<tr>
<td><strong>Extended Error Event Status Enable Register</strong></td>
<td></td>
</tr>
<tr>
<td>Main Application</td>
<td><strong>Read</strong> This register is read using an ESE3? query.</td>
</tr>
<tr>
<td></td>
<td><strong>Write</strong> This register is written to using an ESE3 command.</td>
</tr>
<tr>
<td><strong>Clear</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; An ESE3 command with a data value of 0 (i.e., ESE3 0) is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on.</td>
</tr>
<tr>
<td></td>
<td>&lt;3&gt; When the language mode has been switched.</td>
</tr>
<tr>
<td><strong>Extended End Event Status Register</strong></td>
<td></td>
</tr>
<tr>
<td>Main Application</td>
<td><strong>Read</strong> This register is read using an ESR2? query.</td>
</tr>
<tr>
<td></td>
<td><strong>Write</strong> This register cannot be written externally.</td>
</tr>
<tr>
<td><strong>Clear</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; The *CLS command is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on.</td>
</tr>
<tr>
<td></td>
<td>&lt;3&gt; An event is read in response to an ESR2? query command.</td>
</tr>
<tr>
<td></td>
<td>&lt;4&gt; When the language mode has been switched.</td>
</tr>
<tr>
<td><strong>Extended End Event Status Enable Register</strong></td>
<td></td>
</tr>
<tr>
<td>Main Application</td>
<td><strong>Read</strong> This register is read using an ESE2? query.</td>
</tr>
<tr>
<td></td>
<td><strong>Write</strong> This register is written to using an ESE2 command.</td>
</tr>
<tr>
<td><strong>Clear</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;1&gt; An ESE2 command with a data value of 0 (i.e., ESE2 0) is received.</td>
</tr>
<tr>
<td></td>
<td>&lt;2&gt; The power is turned on.</td>
</tr>
<tr>
<td></td>
<td>&lt;3&gt; When the language mode has been switched.</td>
</tr>
</tbody>
</table>
### Table E.9.16-1  Extended Event Status Register Operation (Cont'd)

<table>
<thead>
<tr>
<th>Register</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extended Error Event Status Register</strong></td>
<td><strong>Read</strong> This register is read using an ESR1? query.</td>
</tr>
<tr>
<td><strong>(Sub Application)</strong></td>
<td><strong>Write</strong> This register cannot be written externally.</td>
</tr>
</tbody>
</table>
| **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 ESR1? query command.  
|                                              | <4> When the language mode has been switched. |
| **Extended Error Event Enable Register**      | **Read** This register is read using an ESE1? query. |
| **(Sub Application)**                        | **Write** This register is written to using an ESE1 command. |
| **Clear**                                    | 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. |
| **Extended End Event Status Register**        | **Read** This register is read using an ESR0? query. |
| **(Sub Application)**                        | **Write** This register cannot be written externally. |
| **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? query command.  
|                                              | <4> When the language mode has been switched. |
| **Extended End Event Status Enable Register** | **Read** This register is read using an ESE0? query. |
| **(Sub Application)**                        | **Write** This register is written to using an ESE0 command. |
| **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. |
E.10 Synchronization

This section describes synchronized control of the MG3710A/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"
*WAI

RAD:ARB:WMA:WAV
"PackageName","PatternName" ; Loads a waveform pattern.

; Waits until loading completes.

; 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"

*OPC ; Loads a waveform pattern.

*ESR? ; Switches to the operation completion waiting status.

>0 ; Queries the standard event status register directly.

*ESR? ; No event occurred.

>1 ; Queries the standard event status register directly.

RAD:ARB:WMA:WAV
"PackageName","PatternName"

; An event occurred.

; 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:

:MEMory[1]|2:LOAD:WAVEform:WMA|WMB|LONG|COMBination <string1>,<string2>[],<device>]

MMEM:LOAD:WAV:WMA "PackageName","PatternName"
*OPC?

>1

RAD:ARB:WMA:WAV "PackageName","PatternName"

; Loads a waveform pattern.
; Switches to the operation completion waiting status.
; Returns 1 if lading completes.
; Selects a waveform pattern.
E.11 IEEE488.2 Common Device Messages

Described below are the IEEE488.2 Common Device Messages intended to execute the functions of the MG3710A/MG3740A.

### E.11.1 IEEE488.2 Common Device Messages List

<table>
<thead>
<tr>
<th>Function</th>
<th>Command</th>
<th>Query</th>
<th>Response</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification Query</td>
<td>---</td>
<td>*IDN?</td>
<td>company, model, serial number, firmware</td>
<td>model: Main unit model name, serial: Main unit serial number, version: Software package version</td>
</tr>
<tr>
<td>Self Test Query</td>
<td>---</td>
<td>*TST?</td>
<td>n</td>
<td>n = bit7: ALC Alarm, bit6: Internal Baseband Reference Clock Unlock, bit5: Not used, bit4: Internal Reference Frequency Unlock, bit3: RPP generation, bit2: Not used, bit1: Not used, bit0: Not used</td>
</tr>
<tr>
<td>Operation Complete</td>
<td>*OPC</td>
<td>*OPC?</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Preset All</td>
<td>*RST</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Wait to Continue Command</td>
<td>*WAI</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Clear Status Command</td>
<td>*CLS</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Standard Event Status Register Query</td>
<td>---</td>
<td>*ESR?</td>
<td>n</td>
<td></td>
</tr>
</tbody>
</table>
## Table E.11-1  IEEE488.2 Common Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>Function</th>
<th>Command/Query</th>
<th>Query</th>
<th>Response</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Service Request Enable Register | *SRE n       | *SRE? n  | n        | n = SCPI mode  
|                     |               |          |          | bit7 : OPER     
|                     |               |          |          | bit6 : MSS/RQS  
|                     |               |          |          | bit5 : ESB     
|                     |               |          |          | bit4 : MAV     
|                     |               |          |          | bit3 : QUES    
|                     |               |          |          | bit2 : QUE     
|                     |               |          |          | bit1 : Not used
|                     |               |          |          | bit0 : Not used|
| Read Status Byte Query | ---   | *STB? n | n        | n = SCPI mode  
|                     |               |          |          | bit7 : OPER     
|                     |               |          |          | bit6 : MSS/RQS  
|                     |               |          |          | bit5 : ESB     
|                     |               |          |          | bit4 : MAV     
|                     |               |          |          | bit3 : QUES    
|                     |               |          |          | bit2 : QUE     
|                     |               |          |          | bit1 : Not used
|                     |               |          |          | bit0 : Not used|
| Trigger Control     | *TRG         | ---      | ---      | ---       |
E.11 IEEE488.2 Common Device Messages

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/MG3740A functions in alphabetical order.

*CLS
Clear Status Command

Function
Clears the status byte register, 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
Appendix E  Remote Control

*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

n  Standard event status enable register
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
Range  0 to 255
Default  0

Details

This is not initialized by the System Reset (Preset) command.
This is initialized by Power On.

Example of Use

To enable execution error and command error
*ESE 48
*ESE?
>48
*ESR?  
Standard Event Status Register Query

Function

Returns the standard event status register value. If this is queried, the standard event status register is cleared. This is a common IEEE488.2 query.

Query

*ESR?

Response

n

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Standard event status register</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>( \text{bit}0 + \text{bit}1 + \text{bit}2 + \text{bit}3 + \text{bit}4 + \text{bit}5 + \text{bit}6 + \text{bit}7 )</td>
<td></td>
</tr>
<tr>
<td>bit0 : 2^0 = 1</td>
<td>Operation completion</td>
<td></td>
</tr>
<tr>
<td>bit1 : 2^1 = 2</td>
<td>Request control (not used)</td>
<td></td>
</tr>
<tr>
<td>bit2 : 2^2 = 4</td>
<td>Query error</td>
<td></td>
</tr>
<tr>
<td>bit3 : 2^3 = 8</td>
<td>Device error</td>
<td></td>
</tr>
<tr>
<td>bit4 : 2^4 = 16</td>
<td>Execution error</td>
<td></td>
</tr>
<tr>
<td>bit5 : 2^5 = 32</td>
<td>Command error</td>
<td></td>
</tr>
<tr>
<td>bit6 : 2^6 = 64</td>
<td>User request</td>
<td></td>
</tr>
<tr>
<td>bit7 : 2^7 = 128</td>
<td>Power ON</td>
<td></td>
</tr>
</tbody>
</table>

Range 0 to 255

Example of Use

To query the standard event status register value (when an execution error and command error have occurred)

*ESR?

>48
*IDN?  
Identification Query

Function

This command queries the device information. This is a common IEEE488.2 query.

Query

*IDN?

Response

company, model, serialnumber, 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, 6100000000, 1.0.0.0
*OPC/*OPC?  
Operation Complete Command/Query

Function

*OPC/*OPC? is a command/query to synchronize between the device and the external controller (PC). This is a common IEEE488.2 command/query.

If a *OPC command is received, the operation completion bit (bit 0) is set to 1 once all active processes are complete.

If a *OPC? query is received, 1 is returned once all active processes are complete.

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 *CLS command
- Reception of *RST command
- Completion of all active processing

Example of Use

To wait for completion of measurement with *OPC

*CLS

*SRE 32

*ESE 1

MMEM:LOAD:WAV:WMA "PackageName","PatternName"

*OPC?

>1

RAD:ARB:WMA:WAV "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**

Sets the service request enable register. The service request enable register value is returned for the query. This is a common IEEE488.2 command/query.

**Command**

*SRE n

**Query**

*SRE?

**Response**

n

**Parameter**

n  Service request enable register

Value  = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7

<table>
<thead>
<tr>
<th>Bit</th>
<th>Value</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>SCPI not used</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>SCPI QUE</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>SCPI ESB</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>SCPI MSS/RQS</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>Native MAV</td>
</tr>
<tr>
<td>5</td>
<td>32</td>
<td>Native ESB</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>Native MSS/RQS</td>
</tr>
<tr>
<td>7</td>
<td>128</td>
<td>Native OPER</td>
</tr>
</tbody>
</table>

Native mode

<table>
<thead>
<tr>
<th>Bit</th>
<th>Value</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>Extended event status 2nd SG (EESB0)</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Extended event status 2nd SG (EESB1)</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Extended event status 1st SG (EESB2)</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>Extended event status 1st SG (EESB3)</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>Native MAV</td>
</tr>
<tr>
<td>5</td>
<td>32</td>
<td>Native ESB</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>Native MSS/RQS</td>
</tr>
<tr>
<td>7</td>
<td>128</td>
<td>Native OPER</td>
</tr>
</tbody>
</table>

Range 0 to 255

Default 0
Appendix E  Remote Control

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
**E.11 IEEE488.2 Common Device Messages**

**E-79**

---

*STB?*

**Status Byte Register Query**

**Function**

Returns the status byte register value. This is a common IEEE488.2 query.

**Query**

*STB?*

**Response**

n

**Parameter**

n Status byte register

Value = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7

**SCPI mode**

bit0 : 2⁰ = 1 Not used
bit1 : 2¹ = 2 Not used
bit2 : 2² = 4 QUE
bit3 : 2³ = 8 QUES
bit4 : 2⁴ = 16 MAV
bit5 : 2⁵ = 32 ESB
bit6 : 2⁶ = 64 MSS/RQS
bit7 : 2⁷ = 128 OPER

**Native mode**

bit0 : 2⁰ = 1 Extended event status 2nd SG (EESB0)
bit1 : 2¹ = 2 Extended event status 2nd SG (EESB1)
bit2 : 2² = 4 Extended event status 1st SG (EESB2)
bit3 : 2³ = 8 Extended event status 1st SG (EESB3)
bit4 : 2⁴ = 16 MAV
bit5 : 2⁵ = 32 ESB
bit6 : 2⁶ = 64 MSS/RQS
bit7 : 2⁷ = 128 Not used

**Range** 0 to 255

**Example of Use**

To query 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 → MG3710A/MG3740A
E.11  IEEE488.2 Common Device Messages

*TST?
Self-Test Query
Function

Returns the result of the self test. This is a common IEEE488.2 query.

Query

*TST?

Response

n

Parameter

n  Status byte register
Value  = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6 + bit7
bit0 : 2^0 = 1  Not used
bit1 : 2^1 = 2  Not used
bit2 : 2^2 = 4  Not used
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

To query the self test result
*TST?
>0

*WAI
Wait-to-Continue Command

Function

Waits until all active processes are complete before executing the next command. This is a common IEEE488.2 command.

Command

*WAI

Example of Use

To wait for completion of measurement with *WAI
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.
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.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB3</td>
<td>Executing Sweep</td>
</tr>
<tr>
<td>DB4</td>
<td>BERT measurement in progress</td>
</tr>
<tr>
<td>DB11</td>
<td>Calibrating 1st SG</td>
</tr>
<tr>
<td>DB12</td>
<td>Calibrating 2nd SG</td>
</tr>
<tr>
<td>DB13</td>
<td>Executing 1st SG sequence mode</td>
</tr>
<tr>
<td>DB14</td>
<td>Executing 2nd SG sequence mode</td>
</tr>
<tr>
<td>DB15</td>
<td>Fix to 0.</td>
</tr>
</tbody>
</table>

Figure E.12-1  OPERation Status Register
Table E.12-2 lists device messages for the OPERation Status Register.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Status Register Event</td>
<td>:STATus:OPERation[:EVENt]?</td>
</tr>
<tr>
<td>Operation Status Register Condition</td>
<td>:STATus:OPERation:CONDition?</td>
</tr>
<tr>
<td>Operation Status Register Enable</td>
<td>:STATus:OPERation:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:ENABLE?</td>
</tr>
<tr>
<td>Operation Status Register Negative Transition</td>
<td>:STATus:OPERation:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:NTRansition?</td>
</tr>
<tr>
<td>Operation Status Register Positive Transition</td>
<td>:STATus:OPERation:PTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:OPERation:PTRansition?</td>
</tr>
<tr>
<td>Status Preset</td>
<td>:STATus:PRESet</td>
</tr>
</tbody>
</table>
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>

Parameter
<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 the content of the condition register of the OPERation status register.

Query

:STATus:OPERation:CONDition?

Response

<integer>

Parameter

<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 event enable register of the OPERation Status Register.

Command
:STATus:OPERation:ENABle <integer>

Parameter

<integer> Bit sum of event enable register
Resolution 1
Range 0 to 65535

Details
This command is available 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:ENABle?
Operation Status Register Enable Query

Function
This command queries the event enable register of the OPERation Status Register.

Query
:STATus:OPERation:ENABle?

Response
<integer>

Parameter

<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.
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>

Parameter

<integer>  Bit sum of transition filter (negative transition)
Resolution  1
Range       0 to 65535

Details

This command is available only in SCPI mode.

Example of Use

To set the transition filter (negative transition) of the OPERation status register to 16.
STAT:OPER:NTR 16

:STATus:OPERation:NTRansition?
Operation Status Register Negative Transition Query

Function

This command queries the transition filter (negative transition) of the OPERation status register.

Query

:STATus:OPERation:NTRansition?

Response

<integer>

Parameter

<integer>  Bit sum of transition filter (negative transition)
Resolution  1
Range       0 to 65535

Example of Use

To query the transition 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 transition filter (positive transition) of the OPERation status register.

Command
:STATus:OPERation:PTRansition <integer>

Parameter

<integer> Bit sum of transition filter (positive transition)
Resolution 1
Range 0 to 65535

Details
This command is available only in SCPI mode.

Example of Use
To set the transition filter (positive transition) of the OPERation status register to 16.
STAT:OPER:PTR 16
**:STATus:OPERation:PTRansition?**  
Operation Status Register Positive Transition Query

**Function**

This command queries the transition filter (positive transition) of the OPERation status register.

**Query**

:STATus:OPERation:PTRansition?

**Response**

<integer>

**Parameter**

<integer>  
Bit sum of transition filter (positive transition)  
Resolution  
1  
Range  
0 to 65535

**Example of Use**

To query the transition filter (positive transition) of the OPERation status register.

STAT:OPER:PTR?

> 16

**:STATus:PRESet**

Status Preset

**Function**

This command presets all of the transition filters, enable registers, errors and event queue enable registers.

**Command**

:STATus:PRESet

**Parameter**

None

**Details**

This command is available only in SCPI mode.

**Example of Use**

To preset all of the transition filters, enable registers, errors and event queue enable registers.

STAT:PRES
This chapter describes the compatible commands for controlling the MG3710A/MG3740A 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.

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F.1 Native Device Messages

Described below are the commands that do not exist on the MG3700A when controlling the MG3710A/MG3740A using the MG3700 mode.

<table>
<thead>
<tr>
<th>Function</th>
<th>Command</th>
<th>Query</th>
<th>Response</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended End Event Status Enable Register</td>
<td>ESE0 n</td>
<td>ESE0?</td>
<td>n</td>
<td>n = bit7 : Memory optimization check complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit6 : Memory optimization complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit5 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit4 : Waveform pattern loaded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit3 : Measurement complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit2 : Level setting complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit1 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit0 : Frequency setting complete</td>
</tr>
<tr>
<td>Extended End Event Status Register</td>
<td>---</td>
<td>ESR0?</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>Extended Error Event Status Enable Register</td>
<td>ESE1 n</td>
<td>ESE1?</td>
<td>n</td>
<td>n = bit7 : Memory optimization check error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit6 : Memory optimization error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit5 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit4 : Waveform pattern load error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit3 : Measurement error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit2 : Level setting error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit1 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit0 : Frequency setting error</td>
</tr>
<tr>
<td>Extended Error Event Status Register</td>
<td>---</td>
<td>ESR1?</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>Extended End Event Status Enable Register</td>
<td>ESE2 n</td>
<td>ESE2?</td>
<td>n</td>
<td>n = bit7 : Memory optimization check complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit6 : Memory optimization complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit5 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit4 : Waveform pattern loaded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit3 : Measurement complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit2 : Level setting complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit1 : Not used</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>bit0 : Frequency setting complete</td>
</tr>
<tr>
<td>Extended End Event Status Register</td>
<td>---</td>
<td>ESR2?</td>
<td>n</td>
<td></td>
</tr>
</tbody>
</table>
### Table F.1-1  MG3710A-MG3700A Common Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>Function</th>
<th>Command</th>
<th>Query</th>
<th>Response</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Error Event Status Enable Register</td>
<td>ESE3 n</td>
<td>ESE3?</td>
<td>n = bit7 : Memory optimization 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</td>
<td></td>
</tr>
<tr>
<td>Extended Error Event Status Register</td>
<td>---</td>
<td>ESR3?</td>
<td>n</td>
<td></td>
</tr>
<tr>
<td>Select SG</td>
<td>SELECTSG 1</td>
<td>2</td>
<td>SELECTSG?</td>
<td>n = SG No. 1 = SG1 2 = SG2</td>
</tr>
</tbody>
</table>
F.1.1 Functions Device Messages Common to Measurement Equipment

ESE0/ESE0?
Extended End Event Status Enable Register

Function
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
ESE0 n

Query
ESE0?

Response
n

Parameter

n Extended end event status enable register (2nd SG)
Value
= bit0 + bit1 + bit2 + bit3 + bit + bit5 + bit6 + bit7
bit0 : 20 = 1 Frequency setting complete
bit1 : 21 = 2 (Not used)
bit2 : 22 = 4 Level setting complete
bit3 : 23 = 8 Measurement complete
bit4 : 24 = 16 Waveform pattern loaded
bit5 : 25 = 32 (Not used)
bit6 : 26 = 64 Memory optimization complete
bit7 : 27 = 128 Memory optimization check complete
Range 0 to 255
Default 0

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  Extended error event status enable register (2nd SG)
Value  = bit0 + bit1 + bit2 + bit3 + bit + bit5 + bit6 + bit7
    bit0 : 20 = 1  Frequency setting error
    bit1 : 21 = 2  (Not used)
    bit2 : 22 = 4  Level setting error
    bit3 : 23 = 8  Measurement error
    bit4 : 24 = 16 Waveform pattern load error
    bit5 : 25 = 32  (Not used)
    bit6 : 26 = 64 Memory optimization error
    bit7 : 27 = 128 Memory optimization check error
Range   0 to 255
Default 0
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 Extended end event status enable 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 command is available only in native mode.

Example of Use

To enable the waveform pattern loaded and the level setting complete of 1st SG.

ESE2 20
ESE2?
> 20

Related Command

ESR2? Queries the extended end event status register of 1st SG.
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 + bit2 + bit3 + bit + bit5 + bit6 + bit7
bit0 : 2⁰ = 1 Frequency setting error
bit1 : 2¹ = 2 Not used
bit2 : 2² = 4 Level setting error
bit3 : 2³ = 8 Measurement error
bit4 : 2⁴ = 16 Waveform pattern load error
bit5 : 2⁵ = 32 Not used
bit6 : 2⁶ = 64 Memory optimization error
bit7 : 2⁷ = 128 Memory optimization check error
Range 0 to 255
Default 0

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 1st SG.
ESE3 20
ESE3?
> 20

Related Command
ESR3? Queries the extended error event status register of 1st SG.
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 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 command is available only in native mode.

Example of Use
To query the extended end event status register of 2nd SG.
ESR0?
>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
n  Extended error event status register of 2nd SG
Value  = bit0 + bit1 + 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 command is available only in native mode.

Example of Use
To query the extended error event status register of 2nd SG.
ESR1?
>1  Frequency setting error

Related Command
ESE1?  Queries the extended error event status enable register of 2nd SG.
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

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 command is available only in native mode.

Example of Use
To query the extended end 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**

```
n  Extended error event status register of 1st SG
Value = bit0 + bit1 + 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 command is available only in native mode.

**Example of Use**

To query the extended error event status register of 1st SG.

```
ESR3?
```

```
>1  Frequency setting error
```

**Related Command**

```
ESE3?
```

Queries the extended error event status enable register of 1st SG.
SELECTSG/SELECTSG?

Select SG

Function

This command selects the corresponding SG to be operated with the remote command.

This command does not exist on the MG3700A. It is used to select SG of the MG3710A/MG3740A.

Setting a numeric value other than “1” and “2” causes an error. (Out of range)

Command

SELECTSG 1|2

Query

SELECTSG?

Response

n

Parameter

n  No. of SG
1  SG1
2  SG2

Default 1

Details

This command is available only in native mode.

Example of Use

To select SG2 to be controlled
SELECTSG 2
SELECTSG?
> 2
### F.2 MG3710A-MG3700A Common Functions

**Note:**

Column SG1/2 of the compatible list shows whether the behavior changes according to the SELECTSG command.

- ✓: The SELECTSG command 1 is for SG1, and 2 is for SG2.
- N/A: Command not related to SG1/2.

### F.2.1 MG3710A-MG3740A-MG3700A Common Functions

Given below is the compatible list of the functions device common to messages measurement equipment.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSPL ON</td>
<td>OFF</td>
<td>✓</td>
<td>DSPL ON</td>
<td>OFF</td>
<td>N/A</td>
</tr>
<tr>
<td>DSPL?</td>
<td>✓</td>
<td>DSPL?</td>
<td>N/A</td>
<td>Turns the display On/Off</td>
<td>:DISPlay:ENABLe?</td>
</tr>
<tr>
<td>−</td>
<td>✓</td>
<td>ESE0 &lt;integer&gt;</td>
<td>N/A</td>
<td>Sets the extended status enable register</td>
<td>−</td>
</tr>
<tr>
<td>−</td>
<td>✓</td>
<td>ESE0?</td>
<td>N/A</td>
<td>For notification of the end of SG2: Not existing on the MG3700A.</td>
<td>−</td>
</tr>
<tr>
<td>−</td>
<td>✓</td>
<td>ESE1 &lt;integer&gt;</td>
<td>N/A</td>
<td>Sets the extended status enable register</td>
<td>−</td>
</tr>
<tr>
<td>−</td>
<td>✓</td>
<td>ESE1 &lt;integer&gt;</td>
<td>N/A</td>
<td>For notification of the error of SG2: Not existing on the MG3700A.</td>
<td>−</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td></td>
</tr>
</tbody>
</table>
| –                | √             | ESE1?                                  | N/A    | Reads the extended status enable register  
|                  |               |                                        |        | For notification of the error of SG2; Not existing on the MG3700A. |
| ESE2 n           | √             | ESE2 <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>                         | 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           |
| –                | √             | ESR0?                                  | N/A    | Sets the extended status register  
|                  |               |                                        |        | For notification of the end of SG2; Not existing on the MG3700A. |
| –                | √             | 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  
<p>|                  |               |                                        |        | For notification of SG1 errors           |</p>
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAD ON</td>
<td>OFF</td>
<td>√</td>
<td>HEAD ON</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Header of the response message</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adds no header section to the response of the IEEE488.2 common commands such as *IDN? even if the HEAD is on.</td>
</tr>
<tr>
<td>HEAD?</td>
<td>√</td>
<td>HEAD?</td>
<td>N/A</td>
<td>Header of the response message</td>
</tr>
<tr>
<td>KNOBHOLD ON</td>
<td>OFF</td>
<td>√</td>
<td>KNOBHOLD ON</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Holds the rotary knob.</td>
</tr>
<tr>
<td>KNOBHOLD?</td>
<td>√</td>
<td>KNOBHOLD?</td>
<td>N/A</td>
<td>Holds the rotary knob</td>
</tr>
<tr>
<td>PRE</td>
<td>√</td>
<td>PRE</td>
<td>N/A</td>
<td>System Preset</td>
</tr>
<tr>
<td>SCOPY</td>
<td>√</td>
<td>SCOPY [&lt;string&gt;,[&lt;device&gt;]]</td>
<td>N/A</td>
<td>Copies the screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Device specified with SCRCPYMEDIA when &lt;device&gt; is omitted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The formats to be used are those currently set with the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>:MEMory:STORe:SCReen [&lt;filename&gt;[,&lt;device&gt;]]</td>
</tr>
<tr>
<td>ERRMSG?</td>
<td>√</td>
<td>ERRMSG?</td>
<td>N/A</td>
<td>Obtains error messages</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Obtains only the error occurred immediately before</td>
</tr>
</tbody>
</table>

MG3710A/MG3740A Commands (SCPI mode)
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN?</td>
<td>✓</td>
<td>SCREEN?</td>
<td>N/A</td>
<td>Current screen Returns the options set immediately before with the SCREEN command The default is FREQ_Top.</td>
<td>–</td>
</tr>
<tr>
<td>–</td>
<td>✓</td>
<td>SELECTSG 1</td>
<td>2</td>
<td>N/A</td>
<td>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/MG3740A Setting a numeric value other than “1” and “2” causes an error. (Out of range)</td>
</tr>
<tr>
<td>–</td>
<td>✓</td>
<td>SELECTSG?</td>
<td>N/A</td>
<td>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/MG3740A</td>
<td>[:SOURce]:PORT?</td>
</tr>
</tbody>
</table>
### F.3 Frequency & Channel Function

#### F.3.1 Frequency & Channel function

Given below is the compatible list of the frequency & channel functions device messages.

Table F.3.1-1 Compatible List of Frequency & Channel Functions Device Messages

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN FREQ_TOP</td>
<td>✓</td>
<td>SCREEN FREQ_TOP</td>
<td>N/A</td>
<td>Moves to the frequency screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>FREQ f</td>
<td>✓</td>
<td>FREQ &lt;freq&gt;</td>
<td>✓</td>
<td>Sets frequency</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>BPADISP FREQ</td>
<td>CH</td>
<td>✓</td>
<td>BPADISP FREQ</td>
<td>CH</td>
<td>✓</td>
</tr>
<tr>
<td>BPADISP?</td>
<td>✓</td>
<td>BPADISP?</td>
<td>✓</td>
<td>Switches between frequency and channel</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>FRS UP</td>
<td>DN</td>
<td>DOWN</td>
<td>✓</td>
<td>FRS UP</td>
<td>DN</td>
</tr>
<tr>
<td>FIS f</td>
<td>✓</td>
<td>FIS &lt;freq&gt;</td>
<td>✓</td>
<td>Increments the step of the frequency</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
Table F.3.1-1  Compatible List of Frequency & Channel Functions Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIS?</td>
<td>√</td>
<td>FIS?</td>
<td>√</td>
<td>Increments the step of the frequency</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>FREQSWSPEED</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Frequency switching speed</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SPREV</td>
<td>√</td>
<td>SPREV</td>
<td>√</td>
<td>RF spectrum</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>REF?</td>
<td>√</td>
<td>REF?</td>
<td>N/A</td>
<td>Queries the frequency reference</td>
<td>–</td>
</tr>
<tr>
<td>PLLCOND?</td>
<td>√</td>
<td>PLLCOND?</td>
<td>N/A</td>
<td>Queries the PLL Condition</td>
<td>–</td>
</tr>
<tr>
<td>SCREEN FREQ_PHASE</td>
<td>√</td>
<td>SCREEN FREQ_PHASE</td>
<td>N/A</td>
<td>Moves to the RF output phase adjust</td>
<td>ment screen. This command is acc</td>
</tr>
<tr>
<td>RFPHASE d</td>
<td>√</td>
<td>RFPHASE &lt;phase&gt;</td>
<td>√</td>
<td>RF output phase</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>RFPHASE?</td>
<td>√</td>
<td>RFPHASE?</td>
<td>√</td>
<td>RF output phase</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SCREEN CHAN_TOP</td>
<td>√</td>
<td>SCREEN CHAN_TOP</td>
<td>N/A</td>
<td>Moves to the channel screen</td>
<td>–</td>
</tr>
</tbody>
</table>
### Table F.3.1-1  Compatible List of Frequency & Channel Functions Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN</td>
<td>✓</td>
<td>SCREEN CHAN_EDIT</td>
<td>N/A</td>
<td>Moves to the channel edit screen.</td>
<td>–</td>
</tr>
<tr>
<td>CHAN_EDIT</td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>CH n</td>
<td>✓</td>
<td>CH &lt;ext_integer&gt;</td>
<td>✓</td>
<td>Sets the channel number.</td>
<td>[:SOURCE[1]</td>
</tr>
<tr>
<td>CH?</td>
<td>✓</td>
<td>CH?</td>
<td>✓</td>
<td>Sets the channel number.</td>
<td>[:SOURCE[1]</td>
</tr>
<tr>
<td>CHS UP</td>
<td>DN</td>
<td>DOWN</td>
<td>✓</td>
<td>CHS UP</td>
<td>DN</td>
</tr>
<tr>
<td>CHFDISP ON</td>
<td>OFF</td>
<td>✓</td>
<td>CHFDISP ON</td>
<td>OFF</td>
<td>✓</td>
</tr>
<tr>
<td>CHGRPSEL n</td>
<td>✓</td>
<td>CHGRPSEL &lt;ext_integer&gt;</td>
<td>✓</td>
<td>Sets the channel group Setting this when no channel group exists causes an error</td>
<td>[:SOURCE[1]</td>
</tr>
<tr>
<td>CHGRPSEL?</td>
<td>✓</td>
<td>CHGRPSEL?</td>
<td>✓</td>
<td>Sets the channel group Querying when no group is selected causes an error</td>
<td>[:SOURCE[1]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>------------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>CHTBLALLCLR</td>
<td>√</td>
<td>CHTBLALLCLR</td>
<td>√</td>
<td>Entirely clears the channel table</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>CHTBL n1,s,n2,n3,f1,f2</td>
<td>√</td>
<td>CHTBL &lt;ext_integer1&gt;,&lt;string&gt;,&lt;ext_integer2&gt;,&lt;ext_integer3&gt;,&lt;freq1&gt;,&lt;freq2&gt;</td>
<td>√</td>
<td>Edits the channel table</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>CHTBL? n1</td>
<td>√</td>
<td>CHTBL? &lt;ext_integer&gt;</td>
<td>√</td>
<td>Edits the channel table</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>CHTBLDEL n</td>
<td>√</td>
<td>CHTBLDEL &lt;ext_integer&gt;</td>
<td>√</td>
<td>Clears the channel table</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>CHFILESAVE s</td>
<td>√</td>
<td>CHFILESAVE &lt;string&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Stores the channel table</td>
<td>:MMEMory&lt;1</td>
</tr>
<tr>
<td>CHFILERECALL s</td>
<td>√</td>
<td>CHFILERECALL &lt;string&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Reads the channel table</td>
<td>:MMEMory&lt;1</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>CHCURFILE?</td>
<td>✓</td>
<td>CHCURFILE?</td>
<td>✓</td>
<td>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)</td>
<td>–</td>
</tr>
<tr>
<td>CHMEDIA HDD</td>
<td>CF</td>
<td>✓</td>
<td>CHMEDIA HDD</td>
<td>SHDD</td>
<td>CF</td>
</tr>
<tr>
<td>CHMEDIA?</td>
<td>✓</td>
<td>CHMEDIA?</td>
<td>✓</td>
<td>Selects the media to store/read the channel table. Returns CF for drives other than C and 2nd HDD</td>
<td>–</td>
</tr>
</tbody>
</table>
### F.4 Level Function

#### F.4.1 Level function

Given below is the compatible list of the level function device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN LVL_TOP</td>
<td>✓</td>
<td>SCREEN LVL_TOP</td>
<td>N/A</td>
<td>Moves to the level screen</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved</td>
<td>—</td>
</tr>
<tr>
<td>LVL ON</td>
<td>OFF</td>
<td>✓</td>
<td>LVL ON</td>
<td>OFF</td>
<td>✓</td>
</tr>
<tr>
<td>LVL?</td>
<td>✓</td>
<td>LVL?</td>
<td>✓</td>
<td>Turns the RF output On/Off</td>
<td>:OUTPut[1]</td>
</tr>
<tr>
<td>OLVL 1</td>
<td>✓</td>
<td>OLVL &lt;ampl&gt;</td>
<td>✓</td>
<td>RF output level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>OLVL? [DBM</td>
<td>DBU]</td>
<td>✓</td>
<td>OLVL? [DBM</td>
<td>DBU]</td>
<td>✓</td>
</tr>
<tr>
<td>OLS UP</td>
<td>DN</td>
<td>DOWN</td>
<td>✓</td>
<td>OLS UP</td>
<td>DN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>:OUTPut[1]</td>
</tr>
<tr>
<td></td>
<td>:OUTPut[1]</td>
</tr>
<tr>
<td></td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td></td>
<td>Uses the unit specified by VDSPL, when DBU is selected</td>
</tr>
<tr>
<td></td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>OLU DBM</td>
<td>DBU</td>
</tr>
<tr>
<td>OLU?</td>
<td>√</td>
</tr>
<tr>
<td>VDSPL EMF</td>
<td>TERM</td>
</tr>
<tr>
<td>VDSPL?</td>
<td>√</td>
</tr>
<tr>
<td>OOS 1</td>
<td>√</td>
</tr>
<tr>
<td>OOS?</td>
<td>√</td>
</tr>
<tr>
<td>OOF ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>
Table F.4.1-1  Compatible List of Level Functions Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OOF?</td>
<td>√</td>
<td>OOF?</td>
<td>√</td>
<td>Turns the offset on/off</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>ORL ON</td>
<td>OFF</td>
<td>√</td>
<td>ORL ON</td>
<td>OFF</td>
<td>√</td>
</tr>
<tr>
<td>ORL?</td>
<td>√</td>
<td>ORL?</td>
<td>√</td>
<td>Turns the relative level on/off</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>OCNT ON</td>
<td>OFF</td>
<td>√</td>
<td>OCNT ON</td>
<td>OFF</td>
<td>√</td>
</tr>
<tr>
<td>OIS l</td>
<td>√</td>
<td>OIS &lt;rel_ampl&gt;</td>
<td>√</td>
<td>Increments the step level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>OIS?</td>
<td>√</td>
<td>OIS?</td>
<td>√</td>
<td>Increments the step level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>CAL</td>
<td>√</td>
<td>CAL</td>
<td>√</td>
<td>Executes the level calibration</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td><strong>Table F.4.1-1 Compatible List of Level Functions Device Messages (Cont’d)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MG3700A Commands</strong></td>
<td><strong>Compatibility</strong></td>
<td><strong>MG3710A/MG3740A Commands (MG3700 mode)</strong></td>
<td><strong>SG 1/2</strong></td>
<td><strong>Remarks</strong></td>
<td><strong>MG3710A/MG3740A Commands (SCPI mode)</strong></td>
</tr>
<tr>
<td>OLRV</td>
<td>✓</td>
<td>ORLV &amp;rel ampl&amp;</td>
<td>✓</td>
<td>Relative output level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>EXTALC ON</td>
<td>OFF</td>
<td>N/A</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>EXTALC?</td>
<td>N/A</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>ALCSTT?</td>
<td>✓</td>
<td>ALCSTT?</td>
<td>✓</td>
<td>Obtains the ALC status</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>LVLACCSTT?</td>
<td>✓</td>
<td>LVLACCSTT?</td>
<td>✓</td>
<td>Obtains the level accuracy status Regards as unleveled, when the [:SOURce[1]</td>
<td>2]:POWe r:UNLeveled:ERRror? is other than NORM.</td>
</tr>
<tr>
<td>ATTCHESTT?</td>
<td>✓</td>
<td>ATTCHESTT?</td>
<td>✓</td>
<td>Obtains the attenuator wearing status</td>
<td>–</td>
</tr>
<tr>
<td>LVLSTTLST?</td>
<td>✓</td>
<td>LVLSTTLST?</td>
<td>✓</td>
<td>Level output status</td>
<td>–</td>
</tr>
</tbody>
</table>
### F.5 Modulation Functions

#### F.5.1 Common to modulation functions

Given below is the compatible list of device messages common to modulation functions

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_TOP</td>
<td>✓</td>
<td>SCREEN BB_TOP</td>
<td>N/A</td>
<td>Moves to the modulation function screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved</td>
<td></td>
</tr>
<tr>
<td>BBREFCOND?</td>
<td>✓</td>
<td>BBREFCOND?</td>
<td>✓</td>
<td>BB Reference Clock Condition</td>
<td>[:SOURce[1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NORMAL · Int lock or Ext lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UNLOCK · Int unlock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CHKEXT · Ext unlock</td>
<td></td>
</tr>
</tbody>
</table>

- MSCP -
### F.5.2 Modulation

Given below is the compatible list of the modulation device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_ADVANCE</td>
<td>✓</td>
<td>SCREEN BB_ADVANCE</td>
<td>N/A</td>
<td>Moves to the Advanced Menu screen</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>DLRES</td>
<td>✓</td>
<td>DLRES</td>
<td>✓</td>
<td>Waveform Restart</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>LOADEDFILESEL WMA,s1,s2</td>
<td>✓</td>
<td>LOADEDFILESEL WMA,&lt;string1&gt;,&lt;string2&gt;</td>
<td>✓</td>
<td>Selects waveform files</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>LOADEDFILESEL WMB,s1,s2</td>
<td>✓</td>
<td>LOADEDFILESEL WMB,&lt;string1&gt;,&lt;string2&gt;</td>
<td>✓</td>
<td>Selects waveform files</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
Table F.5.2-1  Compatible List of Modulation Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOADEDFILESEL</td>
<td>✓</td>
<td>LOADEDFILESEL</td>
<td>✓</td>
<td>Selects waveform files</td>
<td>(:SOURce[1]</td>
</tr>
<tr>
<td>LONG,s1,s2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LONG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOADEDFILESEL</td>
<td>✓</td>
<td>LOADEDFILESEL</td>
<td>✓</td>
<td>Selects waveform files</td>
<td>(:SOURce[1]</td>
</tr>
<tr>
<td>COMB,s1,s2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAT a,s1,s2</td>
<td>✓</td>
<td>PAT WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB,&lt;string1&gt;,&lt;string2&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Operates similarly as the</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LOADEDFILESEL.....command</td>
<td></td>
</tr>
</tbody>
</table>

F.5 Modulation Functions
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATCOMBMODE</td>
<td>√</td>
<td>PATCOMBMODE EDIT</td>
<td>DEFINED</td>
<td>√</td>
<td>Pattern Addition [:SOURce[1]</td>
</tr>
<tr>
<td>PATSOF n</td>
<td>√</td>
<td>PATSOF &lt;ext_integer&gt;</td>
<td>√</td>
<td>Start Offset [:SOURce[1]</td>
<td>2]:RADi o:ARB:TIME:SOFFset &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>PATWMALVL l</td>
<td>√</td>
<td>PATWMALVL &lt;ampl&gt;</td>
<td>√</td>
<td>Pattern (WM(A)) Level [:SOURce[1]</td>
<td>2]:RADi o:ARB:WMA:POWer &lt;ampl&gt;</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>-----------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>PATWMBLVL 1</td>
<td>√</td>
<td>PATWMBLVL &lt;ampl&gt;</td>
<td></td>
<td>Pattern (WM(B)) Level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not depend on the AWGN converted value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reads by specifying the unit DBM : dBm, DBU : dBBV(EMF), DBUT : dBBV(TERM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATWMDLVL 1</td>
<td>√</td>
<td>PATWMDLVL &lt;ampl&gt;</td>
<td></td>
<td>Pattern (WM(B')) Level</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not depend on the AWGN converted value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reads by specifying the unit DBM : dBm, DBU : dBBV(EMF), DBUT : dBBV(TERM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATWMOUT WMA</td>
<td>WMB</td>
<td>WMAB</td>
<td>√</td>
<td>PATWMOUT WMA</td>
<td>WMB</td>
</tr>
<tr>
<td>POWRATIOTARGET WMA</td>
<td>WMB</td>
<td>CONSTANT</td>
<td>√</td>
<td>POWRATIOTARGET WMA</td>
<td>WMB</td>
</tr>
<tr>
<td>POWRATIOTARGET?</td>
<td>√</td>
<td>POWRATIOTARGET?</td>
<td></td>
<td>For setting the A/B output ratio</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>

Table F.5.2-1  Compatible List of Modulation Device Messages (Cont’d)
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATWMPOWRATIO 1</td>
<td>√</td>
<td>PATWMPOWRATIO &lt;rel_ampl&gt;</td>
<td>√</td>
<td>A/B output ratio</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>PATWMFOF f</td>
<td>√</td>
<td>PATWMFOF &lt;freq&gt;</td>
<td>√</td>
<td>Frequency Offset</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>PATWMMAOF f</td>
<td>√</td>
<td>PATWMMAOF &lt;freq&gt;</td>
<td>√</td>
<td>Frequency Offset</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SAMPLINGCLK f</td>
<td>√</td>
<td>SAMPLINGCLK &lt;freq&gt;</td>
<td>√</td>
<td>Sampling Clock</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
### Table F.5.2-1 Compatible List of Modulation Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPF a</td>
<td>✓</td>
<td>LPF</td>
<td>AUTO</td>
<td>THROUGH</td>
<td>100KHZ</td>
</tr>
<tr>
<td>LPF?</td>
<td>✓</td>
<td>LPF?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>RMSVAL 1</td>
<td>✓</td>
<td>RMSVAL</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>RMSVAL?</td>
<td>✓</td>
<td>RMSVAL?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CENTERSIG WMA</td>
<td>WMB</td>
<td>✓</td>
<td>CENTERSIG WMA</td>
<td>WMB</td>
<td>BDC</td>
</tr>
<tr>
<td>CENTERSIG?</td>
<td>✓</td>
<td>CENTERSIG?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DMOD ON</td>
<td>OFF</td>
<td>✓</td>
<td>DMOD ON</td>
<td>OFF</td>
<td>✓</td>
</tr>
<tr>
<td>IQSRC INT</td>
<td>EXT</td>
<td>✓</td>
<td>IQSRC INT</td>
<td>EXT</td>
<td>✓</td>
</tr>
</tbody>
</table>

[This table continues with more entries similar to the ones shown above.]
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE INT</td>
<td>EXT</td>
<td>√</td>
<td>√</td>
<td>IQ Source</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>IQOUT ON</td>
<td>OFF</td>
<td>√</td>
<td>√</td>
<td>IQ output ON: Analog I/Q Out, OFF :RF</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SMPLCLKMATCH?</td>
<td>√</td>
<td>SMPLCLKMATCH?</td>
<td>√</td>
<td>Sampling Clock Warning of mismatch</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
## F.5.3 Load pattern

Given below is the compatible list of Load Pattern device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_LOADPT</td>
<td>√</td>
<td>SCREEN BB_LOADPT</td>
<td>N/A</td>
<td>Moves to the Load Pattern to Memory screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>LDFILE WMA, s1, s2</td>
<td>√</td>
<td>LDFILE WMA, string1, string2[, device]</td>
<td>√</td>
<td>Loads waveform files</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Asynchronous command</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C, when device is omitted</td>
<td></td>
</tr>
<tr>
<td>LDFILE? WMA</td>
<td>√</td>
<td>LDFILE? WMA, string1, string2[, device]</td>
<td>√</td>
<td>Loads waveform files</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C, when device is omitted</td>
<td></td>
</tr>
<tr>
<td>LDFILE WMB, s1, s2</td>
<td>√</td>
<td>LDFILE WMB, string1, string2[, device]</td>
<td>√</td>
<td>Loads waveform files</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Asynchronous command</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C, when device is omitted</td>
<td></td>
</tr>
<tr>
<td>LDFILE? WMB</td>
<td>√</td>
<td>LDFILE? WMB, string1, string2[, device]</td>
<td>√</td>
<td>Loads waveform files</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C, when device is omitted</td>
<td></td>
</tr>
<tr>
<td>LDFILE LONG, s1, s2</td>
<td>√</td>
<td>LDFILE LONG, string1, string2[, device]</td>
<td>√</td>
<td>Loads waveform files</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C, when device is omitted</td>
<td></td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>LDFILE? LONG</td>
<td>√</td>
<td>LDFILE? LONG, &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Loads waveform files C, when &lt;device&gt; is omitted</td>
<td>:MMEMory[1]</td>
</tr>
<tr>
<td>LDFILE COMB,s1,s2</td>
<td>√</td>
<td>LDFILE CONB, &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Loads waveform files C, when &lt;device&gt; is omitted</td>
<td>:MMEMory[1]</td>
</tr>
<tr>
<td>LDFILE? COMB</td>
<td>√</td>
<td>LDFILE? COMB, &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Loads waveform files C, when &lt;device&gt; is omitted</td>
<td>:MMEMory[1]</td>
</tr>
<tr>
<td>LDPAT a,s1,s2</td>
<td>√</td>
<td>LDPAT WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB,&lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
</tr>
</tbody>
</table>

Table F.5.3-1  Compatible List of Load Pattern Device Messages (Cont’d)
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEQFILELDCHK s1, s2</td>
<td>✓</td>
<td>SEQFILELDCHK &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>✓</td>
<td>Confirms whether or not loading of combination files for the sequence mode is enabled Synchronous command C, when &lt;device&gt; is omitted</td>
<td>-</td>
</tr>
<tr>
<td>SEQFILELDCHK?</td>
<td>✓</td>
<td>SEQFILELDCHK?</td>
<td>✓</td>
<td>Confirms whether or not loading of combination files for the sequence mode is enabled.</td>
<td>-</td>
</tr>
<tr>
<td>LDCANCEL</td>
<td>✓</td>
<td>LDCANCEL</td>
<td>✓</td>
<td>Cancels loading of the waveform file to the memory</td>
<td>:MMEMory[1]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>LOADEDFILENAME?</td>
<td>√</td>
<td>LOADEDFILENAME? WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB, &lt;ext_integer&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB, &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>PATNAME? WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB, n</td>
<td>√</td>
<td>PATNAME? WMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB, &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>LOADEDFILENUM?</td>
<td>√</td>
<td>LOADEDFILENUM? WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WMA</td>
<td>WMB</td>
<td>LONG</td>
<td>COMB</td>
</tr>
</tbody>
</table>
### Table F.5.3-1  Compatible List of Load Pattern Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATNUM? WMA</td>
<td>✓</td>
<td>PATNUM? WMA</td>
<td>✓</td>
<td>Obtains the number of loaded files</td>
</tr>
<tr>
<td>PATNUM? WMA</td>
<td>✓</td>
<td>PATNUM? WMA</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>CFTOHDD s1, s2</td>
<td>✓</td>
<td>CFTOHDD &lt;string1&gt;</td>
<td>CFROOT,&lt;string2&gt;</td>
<td></td>
</tr>
</tbody>
</table>

**CFTOHDD**

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 opt[011]=Off:
  - opt[011]=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.

**MG3710A/MG3740A Commands (SCPI mode)**

- :MEMory[1]|2:WAVEform:WMA:COUNt?
- :MEMory[1]|2:WAVEform:COUNt?
### Table F.5.3-1  Compatible List of Load Pattern Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELFILEWM ALL</td>
<td>√</td>
<td>DELFILEWM ALL</td>
<td>√</td>
<td>Deletes the waveform files on all memories</td>
<td>:MEMory[1]</td>
</tr>
<tr>
<td>DELPATWM ALL</td>
<td>√</td>
<td>DELPATWM ALL</td>
<td>√</td>
<td>Deletes the waveform files on all memories</td>
<td>:MEMory[1]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMSPC? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTIMIZE WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTIMIZE WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTIMIZE WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTIMIZE WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCHECK WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTCHECK WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCHECK WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTCHECK WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
<td>WMOPTCHECK? WMA</td>
<td>WMB</td>
<td>√</td>
</tr>
<tr>
<td>WMOPTCANCEL</td>
<td>√</td>
<td>WMOPTCANCEL</td>
<td>√</td>
<td>Stops the optimization of the memory</td>
<td></td>
</tr>
<tr>
<td>HDDSPC?</td>
<td>√</td>
<td>HDDSPC? [&lt;device&gt;]</td>
<td>N/A</td>
<td>Obtains the space information of the hard disk C, when &lt;device&gt; is omitted</td>
<td></td>
</tr>
<tr>
<td>COMB Pat? s1,s2,WMA</td>
<td>WMB</td>
<td>√</td>
<td>COMB Pat? s1,s2,WMA</td>
<td>WMB</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Notes:
- Commands in SCPI mode are in brackets.
- Responses are indicated with comments or symbols.
### Table F.5.3-1  Compatible List of Load Pattern Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
</table>
| COMBTOTALSIZE? s1,s2 | ✓ | COMBTOTALSIZE? <string1>,<string2>,[<device>] | 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 | — |
| SEQELMNUM? s1,s2 | ✓ | SEQELMNUM? <string1>,<string2>,[,<device>] | 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 | — |
| SEQELMNAME? s1,s2,n | ✓ | SEQELMNAME? <string1>,<string2>,<ext_integer>,[,<device>] | 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 | — |
| SEQCURRENTELM? | ✓ | SEQCURRENTELM? ✓ | | Obtains the element number of the pattern regenerated in the sequence | — |
| FILEVER? s1,s2 | ✓ | FILEVER? <string1>,<string2>,[,<device>] | N/A | Queries the version number of the pattern file existing on HDD C, when <device> is omitted | — |
### F.5.4 Ext I/O Setup

Given below is the compatible list of the Ext I/O Setup device messages:

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN B_IOCTL</td>
<td>✓</td>
<td>SCREEN B_IOCTL</td>
<td>N/A</td>
<td>Moves to the Ext I/O Setup screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved</td>
<td></td>
</tr>
<tr>
<td>SFTRG ON</td>
<td>OFF</td>
<td>✓</td>
<td>SFTRG ON</td>
<td>OFF</td>
<td>✓</td>
</tr>
<tr>
<td>SFTRG?</td>
<td>✓</td>
<td>SFTRG?</td>
<td>✓</td>
<td>Start/Frame Trigger</td>
<td></td>
</tr>
<tr>
<td>SFTRGMODE START</td>
<td>FRAME</td>
<td>✓</td>
<td>SFTRGMODE START</td>
<td>FRAME</td>
<td>✓</td>
</tr>
<tr>
<td>SFTRGMODE?</td>
<td>✓</td>
<td>SFTRGMODE?</td>
<td>✓</td>
<td>Start/Frame Trigger Mode</td>
<td></td>
</tr>
<tr>
<td>STGS INT</td>
<td>EXTSTA</td>
<td>EXT</td>
<td>EXT FRM</td>
<td>✓</td>
<td>STGS INT</td>
</tr>
<tr>
<td>STGS?</td>
<td>✓</td>
<td>STGS?</td>
<td>✓</td>
<td>Start/Frame Trigger Source</td>
<td>Returns EXTSTA when Start Trigger is set</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>STDLY n</td>
<td>✓</td>
<td>STDLY &lt;ext_numeric&gt;</td>
<td>✓</td>
<td>Start/Frame Trigger Delay</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Setting unit: In sample point, Resolution: 0.01 The setting of STDLY is as same as that of STDLYSYM (α/OverSampling)</td>
<td>—</td>
</tr>
<tr>
<td>STDLY?</td>
<td>✓</td>
<td>STDLY?</td>
<td>✓</td>
<td>Start/Frame Trigger Delay</td>
<td>—</td>
</tr>
<tr>
<td>STDLYSYM n</td>
<td>✓</td>
<td>STDLYSYM &lt;ext_numeric&gt;</td>
<td>✓</td>
<td>Start/Frame Trigger Delay (to be specified in conversion unit) Resolution: 0.01</td>
<td>[:SOURce]:ARB:TRIGger:DELay &lt;ext_numeric&gt;</td>
</tr>
<tr>
<td>STDLYSYM?</td>
<td>✓</td>
<td>STDLYSYM?</td>
<td>✓</td>
<td>Start/Frame Trigger Delay (to be specified in conversion unit)</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>EIST RISE</td>
<td>FALL</td>
<td>✓</td>
<td>EIST RISE</td>
<td>FALL</td>
<td>✓</td>
</tr>
</tbody>
</table>
### Table F.5.4-1  Compatible List of Ext I/O Setup Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATTRG ON</td>
<td>OFF</td>
<td>✓</td>
<td>PATTRG ON</td>
<td>OFF</td>
<td>✓</td>
</tr>
<tr>
<td>PATTRGEDGE RISE</td>
<td>FALL</td>
<td>✓</td>
<td>PATTRGEDGE RISE</td>
<td>FALL</td>
<td>✓</td>
</tr>
<tr>
<td>PATTRGEDGE?</td>
<td>✓</td>
<td>PATTRGEDGE?</td>
<td>✓</td>
<td>Pattern Trigger Edge Valid only for Pattern Trigger 1</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>REFCLKVAL SIXTEENTH</td>
<td>EIGHTH</td>
<td>QUARTER</td>
<td>HALF</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>MARKERPOL n,a</td>
<td>✓</td>
<td>MARKERPOL &lt;ext_integer&gt;, POS</td>
<td>NEG</td>
<td>✓</td>
<td>Marker Polarity Valid only for WMA</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------</td>
<td>------------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>PMO INT</td>
<td>EXT</td>
<td>OFF</td>
<td>√</td>
<td>PMO INT</td>
<td>EXT</td>
</tr>
<tr>
<td>PMO?</td>
<td>√</td>
<td>PMO?</td>
<td>√</td>
<td>Pulse Modulation Source When setting INT: When RFGate=On EXT: When PulseModulation=On, PulseSource=Ext Pulse, and RFGate=Off OFF: Other than the above:</td>
<td>-</td>
</tr>
</tbody>
</table>
## F.5.5 I/Q tuning

Given below is the compatible list of the I/Q Tuning device messages:

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_IQTUNING</td>
<td>✓</td>
<td>SCREEN BB_IQTUNING</td>
<td>N/A</td>
<td>Moves to the I/Q Tuning screen This command is accepted but the screen is not moved</td>
<td></td>
</tr>
<tr>
<td>IOLTR p</td>
<td>✓</td>
<td>IOLTR &lt;percent&gt;</td>
<td>N/A</td>
<td>I Output Level Trimming</td>
<td>[:SOURce[1]:DM:IQA Djustment:EXTernal:ITRimming &lt;percent&gt;</td>
</tr>
<tr>
<td>IOLTR?</td>
<td>✓</td>
<td>IOLTR?</td>
<td>N/A</td>
<td>I Output Level Trimming</td>
<td>[:SOURce[1]:DM:IQA Djustment:EXTernal:ITRimming?</td>
</tr>
<tr>
<td>QOLTR p</td>
<td>✓</td>
<td>QOLTR &lt;percent&gt;</td>
<td>N/A</td>
<td>Q Output Level Trimming</td>
<td>[:SOURce[1]:DM:IQA Djustment:EXTernal:QTRimming &lt;percent&gt;</td>
</tr>
<tr>
<td>QOLTR?</td>
<td>✓</td>
<td>QOLTR?</td>
<td>N/A</td>
<td>Q Output Level Trimming</td>
<td>[:SOURce[1]:DM:IQA Djustment:EXTernal:QTRimming?</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>ICOMOS 1</td>
<td>✓</td>
<td>ICOMOS &lt;voltage&gt;</td>
<td>N/A</td>
<td>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/MG3740A 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.)</td>
<td></td>
</tr>
<tr>
<td>ICOMOS?</td>
<td>✓</td>
<td>ICOMOS?</td>
<td>N/A</td>
<td>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/MG3740A 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.)</td>
<td></td>
</tr>
<tr>
<td>QCOMOS 1</td>
<td>✓</td>
<td>QCOMOS &lt;voltage&gt;</td>
<td>N/A</td>
<td>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/MG3740A 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.)</td>
<td></td>
</tr>
</tbody>
</table>

[:source :IQADjustment:EXTernal:COFFset <voltage>]

[:SOURce[1]]:DM:IQA Djustment:EXTernal:COFFset?
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
</table>
| QCOMOS?          | ✓             | 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/MG3740A 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 1        | ✓             | IDIFFOS <voltage>                      | N/A    | I Differential Offset | [:SOURce[1]]:DM:IQA Djustment:EXTernal:DIOfset <voltage> |
| IDIFFOS?         | ✓             | IDIFFOS?                               | N/A    | I Differential Offset | [:SOURce[1]]:DM:IQA Djustment:EXTernal:DIOfset? |
| QDIFFOS 1        | ✓             | QDIFFOS <voltage>                      | N/A    | Q Differential Offset | [:SOURce[1]]:DM:IQA Djustment:EXTernal:DIQOfset <voltage> |
| QDIFFOS?         | ✓             | QDIFFOS?                               | N/A    | Q Differential Offset | [:SOURce[1]]:DM:IQA Djustment:EXTernal:DIQOfset? |
## F.5.6 Edit HDD

Given below is the compatible list of Edit HDD device messages.

### Table F.5.6-1 Compatible List of Edit HDD Device Messages

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_EDITHDD</td>
<td>✓</td>
<td>SCREEN BB_EDITHDD</td>
<td>N/A</td>
<td>Moves to the Edit HDD screen&lt;br&gt;This command is accepted but the screen is not moved</td>
<td></td>
</tr>
<tr>
<td>DELFILEHDD s1,s2</td>
<td>✓</td>
<td>DELFILEHDD &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>N/A</td>
<td>Deletes waveform files on the hard disk C, when &lt;device&gt; is omitted&lt;br&gt;wvc is given preference where both wvc and wvi exist.</td>
<td>:MEMORY:DELETE:WAVEform[:NAME] &lt;string1&gt;,&lt;string2&gt;,[&lt;device&gt;]</td>
</tr>
<tr>
<td>DELPATHDD s1,s2</td>
<td>✓</td>
<td>DELPATHDD &lt;string1&gt;,&lt;string2&gt;[,&lt;device&gt;]</td>
<td>N/A</td>
<td>Deletes waveform files on the hard disk C, when &lt;device&gt; is omitted.&lt;br&gt;wvc is given preference where both wvc and wvi exist.</td>
<td>:MEMORY:DELETE:WAVEform[:NAME] &lt;string1&gt;,&lt;string2&gt;,[&lt;device&gt;]</td>
</tr>
</tbody>
</table>
### F.5.7 Sequence Progress

Given below is the compatible list of Sequence Progress device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN BB_PROGRESS</td>
<td>√</td>
<td>SCREEN BB_PROGRESS</td>
<td>N/A</td>
<td>Moves to the Sequence Progress screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>SEQNEXTPAT</td>
<td>√</td>
<td>SEQNEXTPAT</td>
<td>√</td>
<td>Sequence Next Pattern</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SEQRESTART</td>
<td>√</td>
<td>SEQRESTART</td>
<td>√</td>
<td>Sequence Restart</td>
<td>INITiate[1]</td>
</tr>
<tr>
<td>SEQPLAYMODE AUTO</td>
<td>√</td>
<td>SEQPLAYMODE AUTO</td>
<td>√</td>
<td>Sequence Play Mode</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>SEQSWPOINT PAT_END</td>
<td>√</td>
<td>SEQSWPOINT PAT_END</td>
<td>FRAME_END</td>
<td>Sequence Switching Point</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
F.6 Utility Function

F.6.1 Common to utility functions

Given below is the compatible list of device messages common to utility functions.

Table F.6.1-1  Compatible List of Device Messages Common To Utility Functions

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_TOP</td>
<td>√</td>
<td>SCREEN UTIL_TOP</td>
<td>N/A</td>
<td>Moves to the utility function top screen. This command is accepted but the screen is not moved.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th></th>
</tr>
</thead>
</table>
Given below is the compatible list of Save/Recall device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_PARAMSR</td>
<td>✓</td>
<td>SCREEN UTIL_PARAMSR</td>
<td>N/A</td>
<td>Moves to the Parameter Save/Recall screen. This command is accepted but the screen is not moved.</td>
<td>—</td>
</tr>
<tr>
<td>PRMSAV &lt;string&gt;,&lt;device&gt;</td>
<td>✓</td>
<td>PRMSAV &lt;string&gt;,&lt;device&gt;</td>
<td>N/A</td>
<td>Parameter Save The device specified by PRMMEDIA when &lt;device&gt; is omitted.</td>
<td>:MMEMory:STORe:STATe [&lt;filename&gt;,&lt;device&gt;]</td>
</tr>
<tr>
<td>PRMREC &lt;string&gt;,&lt;device&gt;</td>
<td>✓</td>
<td>PRMREC &lt;string&gt;,&lt;device&gt;</td>
<td>N/A</td>
<td>Parameter Recall The device specified by PRMMEDIA when &lt;device&gt; is omitted.</td>
<td>:MMEMory:LOAD:STATe &lt;filename&gt;,&lt;device&gt;</td>
</tr>
<tr>
<td>PRMDEL &lt;string&gt;,&lt;device&gt;</td>
<td>✓</td>
<td>PRMDEL &lt;string&gt;,&lt;device&gt;</td>
<td>N/A</td>
<td>Parameter File Delete The device specified by PRMMEDIA when &lt;device&gt; is omitted.</td>
<td>:MMEMory:DELeTe:STATe &lt;filename&gt;,&lt;device&gt;</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>PRMMEDIA HDD</td>
<td>CF</td>
<td>√</td>
<td>PRMMEDIA HDD</td>
<td>CF</td>
<td>N/A</td>
</tr>
<tr>
<td>PRMMEDIA?</td>
<td>√</td>
<td>PRMMEDIA?</td>
<td>N/A</td>
<td>Selects media for Save/Recall</td>
<td>-</td>
</tr>
</tbody>
</table>
## F.6.3 BER Measurement

Given below is the compatible list of the BER measurement device messages.

**Table F.6.3-1  Compatible List of BER Measurement Device Messages**

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_BERT</td>
<td>√</td>
<td>SCREEN UTIL_BERT</td>
<td>N/A</td>
<td>Moves to the BER measurement screen</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td>–</td>
</tr>
<tr>
<td>SCREEN UTIL_BER_IO</td>
<td>√</td>
<td>SCREEN UTIL_BER_IO</td>
<td>N/A</td>
<td>Moves to the BER measurement Interface Setup screen</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td>–</td>
</tr>
<tr>
<td>SCREEN UTIL_BER_RESYNC</td>
<td>√</td>
<td>SCREEN UTIL_BER_RESYNC</td>
<td>N/A</td>
<td>Moves to the BER measurement Resync Condition Setup screen</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td>–</td>
</tr>
<tr>
<td>BERSTART</td>
<td>√</td>
<td>BERSTART</td>
<td>N/A</td>
<td>Executes the BER measurement</td>
<td>:INITiate:BERT[:IMMediate]</td>
</tr>
<tr>
<td>BERSTOP</td>
<td>√</td>
<td>BERSTOP</td>
<td>N/A</td>
<td>Stops the BER measurement</td>
<td>:ABORT:BERT</td>
</tr>
<tr>
<td>BERCOUNTCLR</td>
<td>√</td>
<td>BERCOUNTCLR</td>
<td>N/A</td>
<td>Clears the BER measurement bit</td>
<td>[:SENSe]:BERT[:BASEband]::COUNt:CLEar</td>
</tr>
<tr>
<td>BERDATA POS</td>
<td>NEG</td>
<td>√</td>
<td>BERDATA POS</td>
<td>NEG</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table F.6.3-1 Compatible List of BER Measurement Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERDATA?</td>
<td>✓</td>
<td>BERDATA?</td>
<td>N/A</td>
<td>Sets the Data polarity.</td>
<td>:INPut:BERT[:BASeba nd]:DATA:POLarity?</td>
</tr>
<tr>
<td>BERCLK RISE</td>
<td>FALL</td>
<td>✓</td>
<td>BERCLK RISE</td>
<td>FALL</td>
<td>N/A</td>
</tr>
<tr>
<td>BERCLK?</td>
<td>✓</td>
<td>BERCLK?</td>
<td>N/A</td>
<td>Sets the Clock polarity.</td>
<td>:INPut:BERT[:BASeba nd]:CLOCk:POLarity</td>
</tr>
<tr>
<td>BERENBL POS</td>
<td>NEG</td>
<td>DISABLE</td>
<td>✓</td>
<td>BERENBL POS</td>
<td>NEG</td>
</tr>
<tr>
<td>BERENBL?</td>
<td>✓</td>
<td>BERENBL?</td>
<td>N/A</td>
<td>Sets the Enable polarity</td>
<td>:INPut:BERT[:BASeba nd]:CGATe:POLarity</td>
</tr>
<tr>
<td>BERDATATHLD 1</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Data signal threshold level.</td>
<td>—</td>
</tr>
<tr>
<td>BERDATATHLD?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Data signal threshold level</td>
<td>—</td>
</tr>
<tr>
<td>BERCLKTHLD 1</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Clock signal threshold level</td>
<td>—</td>
</tr>
<tr>
<td>BERCLKTHLD?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Clock signal threshold level</td>
<td>—</td>
</tr>
<tr>
<td>BERENBLTHLD 1</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Enable level threshold level</td>
<td>—</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>BERENBLTHLD?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Enable level threshold level</td>
<td></td>
</tr>
<tr>
<td>BERDATADELAY n</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Sets Data Delay</td>
<td></td>
</tr>
<tr>
<td>BERDATADELAY?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Sets Data Delay</td>
<td></td>
</tr>
<tr>
<td>BERENBLDELAY n</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Sets Enable Delay</td>
<td></td>
</tr>
<tr>
<td>BERENBLDELAY?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Sets Enable Delay</td>
<td></td>
</tr>
<tr>
<td>BERINZ HIZ</td>
<td>50</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Input impedance</td>
</tr>
<tr>
<td>BERINZ?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Input impedance</td>
<td></td>
</tr>
<tr>
<td>BERMEDIA HDD</td>
<td>CF</td>
<td>√</td>
<td>BERMEDIA HDD</td>
<td>CF</td>
<td>N/A</td>
</tr>
<tr>
<td>BERMEDIA?</td>
<td>√</td>
<td>BERMEDIA?</td>
<td>N/A</td>
<td>Selects media for the BER measurement log</td>
<td></td>
</tr>
<tr>
<td>BERAUTORESYNC ON</td>
<td>OFF</td>
<td>√</td>
<td>BERAUTORESYNC ON</td>
<td>OFF</td>
<td>N/A</td>
</tr>
<tr>
<td>BERAUTORESYNC?</td>
<td>√</td>
<td>BERAUTORESYNC?</td>
<td>N/A</td>
<td>Sets the automatic resynchronization [:SENSe]:BERT[:BASEband]:RSYNc[:STATe]?</td>
<td></td>
</tr>
<tr>
<td>BERMODE SINGLE</td>
<td>CONTINUOUS</td>
<td>ENDLESS</td>
<td>√</td>
<td>BERMODE SINGLE</td>
<td>CONTINUOUS</td>
</tr>
</tbody>
</table>
## Table F.6.3-1  Compatible List of BER Measurement Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERMODE?</td>
<td>√</td>
<td>BERMODE?</td>
<td>N/A</td>
<td>Sets the measurement mode</td>
<td>[:SENSe]:BERT[:BASEband]:MODE?</td>
</tr>
<tr>
<td>BERCOUNTMODE</td>
<td>√</td>
<td>BERCOUNTMODE</td>
<td>N/A</td>
<td>Measurement end condition</td>
<td>[:SENSe]:BERT[:BASEband]:STOP:CRITeria[:SELECT] EBIT</td>
</tr>
<tr>
<td>TIME</td>
<td>DATABIT</td>
<td>ERRORBIT</td>
<td></td>
<td></td>
<td>TIME specification is not supported</td>
</tr>
<tr>
<td>BERCOUNTMODE?</td>
<td>√</td>
<td>BERCOUNTMODE?</td>
<td>N/A</td>
<td>Measurement end condition</td>
<td>[:SENSe]:BERT[:BASEband]:STOP:CRITeria[:SELECT]</td>
</tr>
<tr>
<td>BERTIME n</td>
<td>N/A</td>
<td>–</td>
<td>–</td>
<td>Measurement time</td>
<td>–</td>
</tr>
<tr>
<td>BERTIME?</td>
<td>N/A</td>
<td>–</td>
<td>–</td>
<td>Measurement time</td>
<td>–</td>
</tr>
<tr>
<td>BERBIT b</td>
<td>√</td>
<td>BERBIT &lt;ext_integer&gt;</td>
<td>N/A</td>
<td>Measurement bit count</td>
<td>[:SENSe]:BERT[:BASEband]:TBITs &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>BERBIT?</td>
<td>√</td>
<td>BERBIT?</td>
<td>N/A</td>
<td>Measurement bit count</td>
<td>[:SENSe]:BERT[:BASEband]:TBITs?</td>
</tr>
<tr>
<td>BERERRORBIT b</td>
<td>√</td>
<td>BERERRORBIT &lt;ext_integer&gt;</td>
<td>N/A</td>
<td>Measurement error bit count</td>
<td>[:SENSe]:BERT[:BASEband]:STOP:CRITeria[:SELECT] EBIT &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>-------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>BERLOG s</td>
<td>√</td>
<td>BERLOG &lt;string&gt;[,&lt;device&gt;]</td>
<td>N/A</td>
<td>Log output Device specified by BERMEDIA when &lt;device&gt; is omitted</td>
<td></td>
</tr>
<tr>
<td>BERLOGCLEAR</td>
<td>√</td>
<td>BERLOGCLEAR</td>
<td>N/A</td>
<td>Clears logs</td>
<td></td>
</tr>
<tr>
<td>BERLOGFILEDEL s</td>
<td>√</td>
<td>BERLOGFILEDEL &lt;string&gt;[,&lt;device&gt;]</td>
<td>N/A</td>
<td>Deletes Log files Device specified by BERMEDIA when &lt;device&gt; is omitted</td>
<td></td>
</tr>
<tr>
<td>BERTYPE</td>
<td>√</td>
<td>BERTYPE</td>
<td>N/A</td>
<td>PN Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PN9</td>
<td>PN11</td>
<td>PN15</td>
<td>PN20</td>
</tr>
<tr>
<td>BERTYPE?</td>
<td>√</td>
<td>BERTYPE?</td>
<td>N/A</td>
<td>PN Type</td>
<td></td>
</tr>
<tr>
<td>RCVBIT?</td>
<td>√</td>
<td>RCVBIT?</td>
<td>N/a</td>
<td>Receive Bit</td>
<td></td>
</tr>
<tr>
<td>BITERR?</td>
<td>√</td>
<td>BITERR?</td>
<td>N/A</td>
<td>Bit Error Count</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SENSe]:BERT[:BASeband]:LOG &lt;string&gt;[,&lt;device&gt;]</td>
</tr>
<tr>
<td>[:SENSe]:DELeTe:BERT[:BASeband]:LOG &lt;string&gt;[,&lt;device&gt;]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>BERSYNCLOSS?</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
|                  | ✓                           | BERSYNCSLOSTHLD?                      | N/A       | Count operation when Sync Loss is detected | [:SENSe]:BERT[:BASe band]:RSYNc:COUNT:A CTo?
|                  | ✓                           | BERSTATUS?                            | N/A       | Obtain the measurement status | — |
|                  | ✓                           | BERERROR?                            | N/A       | Obtain the measurement error status | [:SENSe]:BERT[:BASe band]:ERRor? |
|                  | ✓                           | BERSTOPSTATUS?                       | N/A       | Obtain the measurement stop status | — |
|                  | ✓                           | BERRESULT? EP|ER|EP_WSNCLOS S|ER_WSNCLOS S | N/A       | Obtain the result and status of measurement | — |
### F.6.4 BER Measurement (Data Type Detail Setup)

Given below is the compatible list of BER measurement (Data Type Detail Setup) device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_BER_DETAIL</td>
<td>✓</td>
<td>SCREEN UTIL_BER_DETAIL</td>
<td>N/A</td>
<td>Moves to the BER measurement Data Type Detail screen. This command is accepted but the screen is not moved.</td>
</tr>
<tr>
<td>BERPNINITIAL n</td>
<td>✓</td>
<td>BERPNINITIAL &lt;binary&gt;</td>
<td>N/A</td>
<td>The default value of the PN pattern to be used for PN Fix. Attaches #B at the head of the argument.</td>
</tr>
<tr>
<td>BERPNINITIAL?</td>
<td>✓</td>
<td>BERPNINITIAL?</td>
<td>N/A</td>
<td>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.</td>
</tr>
<tr>
<td>BERPNFIXLENG n</td>
<td>✓</td>
<td>BERPNFIXLENG &lt;ext_integer&gt;</td>
<td>N/A</td>
<td>The length of one cycle of the pattern to be used for PN Fix.</td>
</tr>
<tr>
<td>BERPNFIXLENG?</td>
<td>✓</td>
<td>BERPNFIXLENG?</td>
<td>N/A</td>
<td>The length of one cycle of the pattern to be used for PN Fix.</td>
</tr>
<tr>
<td>BERSYNCCSTARTPOS n</td>
<td>✓</td>
<td>BERSYNCCSTARTPOS &lt;ext_integer&gt;</td>
<td>N/A</td>
<td>Specifies the position of the top bit of the portion in the user defined pattern to be used for synchronization judgment.</td>
</tr>
</tbody>
</table>

Table F.6.4-1 Compatible List of BER Measurement (Data Type Detail Setup) Device Messages
<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERSYNCRSTARTPOS?</td>
<td>√</td>
<td>BERSYNCRSTARTPOS?</td>
<td>N/A</td>
<td>Specifies the position of the top bit of the portion in the user pattern to be used for synchronization judgment</td>
<td>[:SENSe]:BERT[:BAsedband]:PRBS:USER:SYN C:STARt?</td>
</tr>
<tr>
<td>BERSYNCLENG n</td>
<td>√</td>
<td>BERSYNCLENG &lt;ext_integer&gt;</td>
<td>N/A</td>
<td>Length of the portion in the user defined pattern to be used for synchronization judgment</td>
<td>[:SENSe]:BERT[:BAsedband]:PRBS:USER:SYN C:LENGth &lt;ext_integer&gt;</td>
</tr>
<tr>
<td>BERSYNCLENG?</td>
<td>√</td>
<td>BERSYNCLENG?</td>
<td>N/A</td>
<td>Length of the portion in the user defined pattern to be used for synchronization judgment</td>
<td>[:SENSe]:BERT[:BAsedband]:PRBS:USER:SYN C:LENGth?</td>
</tr>
<tr>
<td>BERLOADMEDIA a</td>
<td>√</td>
<td>BERLOADMEDIA HDD</td>
<td>CF</td>
<td>N/A</td>
<td>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</td>
</tr>
<tr>
<td>BERLOADMEDIA?</td>
<td>√</td>
<td>BERLOADMEDIA?</td>
<td>N/A</td>
<td>User defined pattern loading source media</td>
<td>—</td>
</tr>
<tr>
<td>BERUSERPATLST?</td>
<td>√</td>
<td>BERUSERPATLST? [&lt;device&gt;]</td>
<td>N/A</td>
<td>List of the user defined pattern files Device specified by BERLOADMEDIA when &lt;device&gt; is omitted</td>
<td>:MMEMory:LIST:BERT: PATTern? [&lt;device&gt;]</td>
</tr>
<tr>
<td>BERLOADUSERPAT  s</td>
<td>√</td>
<td>BERLOADUSERPAT &lt;string&gt;[,&lt;device&gt;]</td>
<td>N/A</td>
<td>Loads the user defined patterns Device specified by BERLOADMEDIA when &lt;device&gt; is omitted</td>
<td>:MMEMory:LOAD:BERT: PATtern &lt;string&gt;[,&lt;device&gt;]</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>-------</td>
<td>---------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>BERUSERPAT?</td>
<td>✓</td>
<td>BERUSERPAT?</td>
<td>N/A</td>
<td>Current user defined pattern file</td>
<td>[:SENSe]:BERT[:BASEband]:PRBS:USER:PATTern?</td>
</tr>
<tr>
<td>BERUSERPATLENG?</td>
<td>✓</td>
<td>BERUSERPATLENG?</td>
<td>N/A</td>
<td>Current user defined pattern bit length</td>
<td>[:SENSe]:BERT[:BASEband]:PRBS:USER:LENGt?</td>
</tr>
</tbody>
</table>
## F.6.5 Alarm Monitor

Given below is the compatible list of Alarm Monitor device messages.

### Table F.6.5-1 Compatible List of Alarm Monitor Device Messages

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_ALARMMON</td>
<td>√</td>
<td>SCREEN UTIL_ALARMMON</td>
<td>N/A</td>
<td>Moves to the Alarm Monitor screen</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>ALMMONITOR?</td>
<td></td>
<td>ALMMONITOR?</td>
<td>√</td>
<td>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</td>
<td>N/A</td>
</tr>
<tr>
<td>ALMLOG s</td>
<td>√</td>
<td>ALMLOG &lt;string&gt;[,&lt;device&gt;]</td>
<td>√</td>
<td>Alarm History output Device specified by ALMMEDIA when &lt;device&gt; is omitted</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table F.6.5-1 Compatible List of Alarm Monitor Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
</table>
| ALMMMEDIA HDD|CF | √ | ALMMMEDIA HDD|CF | √ | 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 | – |
| ALMMMEDIA? | √ | ALMMMEDIA? | √ | Selects media for Alarm History output | – |
## F.6.6 Interface Setup

Given below is the compatible list of the Interface Setup device messages.

**Table F.6.6-1 Compatible List of Interface Setup Device Messages**

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_IFSET</td>
<td>✓</td>
<td>SCREEN_UTIL_IFSET</td>
<td>N/A</td>
<td>Moves to the Interface Setup Interface Setup screen. This command is accepted but the screen is not moved.</td>
<td>—</td>
</tr>
<tr>
<td>TRM 0</td>
<td>1</td>
<td>LF</td>
<td>CRLF</td>
<td>✓</td>
<td>TRM 0</td>
</tr>
</tbody>
</table>
### Table F.6.7-1 Compatible List of Network Setup Device Messages

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_NETSET</td>
<td>√</td>
<td>SCREEN UTIL_NETSET</td>
<td>N/A</td>
<td>Moves to the Network Setup Interface Setup screen &lt;br&gt; This command is accepted but the screen is not moved.</td>
</tr>
<tr>
<td>HOSTNAME s</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Host Name&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>HOSTNAME?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Host Name&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>DOMAINNAME s</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Host Name&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>DOMAINNAME?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Host Name&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>DHCP ON</td>
<td>OFF</td>
<td>N/A</td>
<td>-</td>
<td>DHCP&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>DHCP?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>DHCP&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>IPAD n1,n2,n3,n4</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>IP Address&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>IPAD?</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>IP Address&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>SUBNET n1,n2,n3,n4</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Subnet mask&lt;br&gt;To be set on Windows</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>SUBNET?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Subnet mask To be set on Windows</td>
</tr>
<tr>
<td>DNSAUTO ON</td>
<td>OFF</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
</tr>
<tr>
<td>DNSAUTO?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>DNS To be set on Windows</td>
</tr>
<tr>
<td>DNS1AD n1,n2,n3,n4</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>DNS Primary Address To be set on Windows</td>
</tr>
<tr>
<td>DNS1AD?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>DNS Primary Address To be set on Windows</td>
</tr>
<tr>
<td>DNS2AD n1,n2,n3,n4</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>DNS Secondary Address To be set on Windows</td>
</tr>
<tr>
<td>DNS2AD?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>DNS Secondary Address To be set on Windows</td>
</tr>
<tr>
<td>GATEWAY n1,n2,n3,n4</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Default Gateway To be set on Windows</td>
</tr>
<tr>
<td>GATEWAY?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>Default Gateway To be set on Windows</td>
</tr>
<tr>
<td>IQPROID s</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>IQproducer User ID To be set on Windows</td>
</tr>
<tr>
<td>IQPROID?</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>IQproducer User ID To be set on Windows</td>
</tr>
<tr>
<td>IQPROPASWD s</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>IQproducer Password To be set on Windows</td>
</tr>
<tr>
<td>IPRENEW</td>
<td>N/A</td>
<td>—</td>
<td>-</td>
<td>IP Address Renew To be set on Windows</td>
</tr>
</tbody>
</table>
Table F.6.7-1  Compatible List of Network Setup Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPRELEASE</td>
<td>N/A</td>
<td>--</td>
<td>-</td>
<td>IP Address Release</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To be set on Windows</td>
<td></td>
</tr>
<tr>
<td>MACAD?</td>
<td>N/A</td>
<td>--</td>
<td>-</td>
<td>MAC Address</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To be set on Windows</td>
<td></td>
</tr>
</tbody>
</table>
## F.6.8 Common Setup

Given below is the compatible list of the Common Setup device messages:

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_COMSET</td>
<td>√</td>
<td>SCREEN UTIL_COMSET</td>
<td>N/A</td>
<td>Moves to the Common Setup screen. This command is accepted but the screen is not moved.</td>
<td>--</td>
</tr>
<tr>
<td>BUZ ON</td>
<td>OFF</td>
<td>√</td>
<td>BUZ ON</td>
<td>OFF</td>
<td>N/A</td>
</tr>
<tr>
<td>BUZ?</td>
<td>√</td>
<td>BUZ?</td>
<td>N/A</td>
<td>Buzzer</td>
<td>:SYSTEM:BEEPer?</td>
</tr>
<tr>
<td>REMDISP NORMAL</td>
<td>REMA</td>
<td>√</td>
<td>REMDISP NORMAL</td>
<td>REMAIN</td>
<td>REMA</td>
</tr>
<tr>
<td>SCRCPYMEDIA HDD</td>
<td>CF</td>
<td>√</td>
<td>SCRCPYMEDIA HDD</td>
<td>CF</td>
<td>N/A</td>
</tr>
<tr>
<td>SCRCPYMEDIA?</td>
<td>√</td>
<td>SCRCPYMEDIA?</td>
<td>N/A</td>
<td>Screen Copy Media</td>
<td>--</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>BITMAPS</td>
<td>✓</td>
<td>BITMAPS</td>
<td>N/A</td>
<td>Bitmap Setup</td>
<td>:MMEMory:STORe:SCRe en:THEMe</td>
</tr>
<tr>
<td>COLOR</td>
<td>GRAY</td>
<td></td>
<td></td>
<td>COLOR:Color, GRAY:Monochrome, REV:Reverse</td>
<td>Normal</td>
</tr>
<tr>
<td>BITMAPS?</td>
<td>✓</td>
<td>BITMAPS?</td>
<td>N/A</td>
<td>Bitmap Setup</td>
<td>:MMEMory:STORe:SCRe en:THEMe?</td>
</tr>
<tr>
<td>TIMESET n1,n2,n3,n4,n5,n6</td>
<td>N/A</td>
<td>–</td>
<td></td>
<td>Time Set</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To be set on Windows</td>
<td>–</td>
</tr>
<tr>
<td>TIMESET?</td>
<td>N/A</td>
<td>–</td>
<td></td>
<td>Time Set</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To be set on Windows</td>
<td>–</td>
</tr>
<tr>
<td>ATTCHECKDISP ON</td>
<td>OFF</td>
<td>ATTCHECKDISP ON</td>
<td>OFF</td>
<td>N/A</td>
<td>Attenuator check Display</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Setting is acceptable but no display is made since no ATT error exists.</td>
<td>–</td>
</tr>
<tr>
<td>ATTCHECKDISP?</td>
<td>✓</td>
<td>ATTCHECKDISP?</td>
<td>N/A</td>
<td>Attenuator check Display</td>
<td>–</td>
</tr>
</tbody>
</table>
### F.6.9 Maintenance Check

Given below is the compatible list of Maintenance Check device messages:

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_MNTCHK</td>
<td>√</td>
<td>SCREEN UTIL_MNTCHK</td>
<td>N/A</td>
<td>Moves to the Maintenance Check screen. This command is accepted but the screen is not moved.</td>
<td>—</td>
</tr>
<tr>
<td>ATTT?</td>
<td>√</td>
<td>ATTT?</td>
<td>N/A</td>
<td>Attenuator Count Always returns 0</td>
<td>—</td>
</tr>
<tr>
<td>RUNT?</td>
<td>√</td>
<td>RUNT?</td>
<td>N/A</td>
<td>Running Time Unit: Time (H) :SystemINFormation:RTIMe?</td>
<td>—</td>
</tr>
</tbody>
</table>
### F.6.10 Hardware Check

Given below is the compatible list of Hardware Check device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL HDCHK</td>
<td>✓</td>
<td>SCREEN UTIL HDCHK</td>
<td>N/A</td>
<td>Moves to the Hardware Check screen</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>SCREEN UTIL HDCHK_OPT</td>
<td>✓</td>
<td>SCREEN UTIL HDCHK_OPT</td>
<td>N/A</td>
<td>Moves to the Option Hardware Check screen</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This command is accepted but the screen is not moved.</td>
<td></td>
</tr>
<tr>
<td>HWC?</td>
<td>N/A</td>
<td>-</td>
<td></td>
<td>Hardware Check result</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This function is not supported, since the HW structure is different.</td>
<td></td>
</tr>
<tr>
<td>HWCBER?</td>
<td>N/A</td>
<td>-</td>
<td></td>
<td>High-speed BER Hardware Check result</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This function is not supported, since the HW structure is different.</td>
<td></td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>SERNUMCPU?</td>
<td>N/A</td>
<td>Not supported due to the different HW structure. To obtain the information about the hardware version, use the following:</td>
<td>-</td>
<td>CPU port serial number</td>
<td>-</td>
</tr>
<tr>
<td>BOARDCPUVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>CPU port version number</td>
<td>-</td>
</tr>
<tr>
<td>FPGACPUVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>CPU FPGA version number</td>
<td>-</td>
</tr>
<tr>
<td>IPLVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>IPL version number</td>
<td>-</td>
</tr>
<tr>
<td>SOFTCPUVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>CPU Software version number</td>
<td>-</td>
</tr>
<tr>
<td>SERNUMIF?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>IF port serial number</td>
<td>-</td>
</tr>
<tr>
<td>BOARDIFVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>IF port version number</td>
<td>-</td>
</tr>
<tr>
<td>FPGADIGVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>Baseband FPGA (Digital) version number</td>
<td>-</td>
</tr>
<tr>
<td>FPGANAVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>Baseband FPGA (Analog) version number</td>
<td>-</td>
</tr>
<tr>
<td>SERNUMRF?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>RF port serial number</td>
<td>-</td>
</tr>
<tr>
<td>BOARDRFVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>RF port version number</td>
<td>-</td>
</tr>
<tr>
<td>FPGARFVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>RF FPGA version number</td>
<td>-</td>
</tr>
<tr>
<td>KEYENCVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>Key Encoder version number</td>
<td>-</td>
</tr>
<tr>
<td>SERNUMBER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>High-speed BER serial number</td>
<td>-</td>
</tr>
<tr>
<td>BOARDBERVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>High-speed BER port version number</td>
<td>-</td>
</tr>
<tr>
<td>FPGABERVER?</td>
<td>N/A</td>
<td></td>
<td>-</td>
<td>High-speed BER FPGA version number</td>
<td>-</td>
</tr>
</tbody>
</table>
### Table F.6.10-1  Compatible List of Hardware Check Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
</table>
| SCREEN UTIL_PRDINF | √ | SCREEN UTIL_PRDINF | N/A | Moves to the Product Information screen  
This command is accepted but the screen is not moved. | — |
| PTYPE?          | √ | PTYPE? | N/A | Product Type | :SYSTem:INFormation :TYPE? |
| PMODEL?         | √ | PMODEL? | N/A | Model Number | :SYSTem:INFormation :MODEl? |
| SERNUM?         | √ | SERNUM? | N/A | Serial Number | :SYSTem:INFormation :SERial? |
| OPT? N          | √ | OPT? <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 | — |
### F.6.11 Install

Given below is the compatible list of Install device messages.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCREEN UTIL_INSTTOP</td>
<td>✓</td>
<td>SCREEN UTIL_INSTTOP</td>
<td>N/A</td>
<td>Moves to the Install screen &lt;br&gt;This command is accepted but the screen is not moved.</td>
</tr>
<tr>
<td>SCREEN UTIL_INSTFRM</td>
<td>✓</td>
<td>SCREEN UTIL_INSTFRM</td>
<td>N/A</td>
<td>Moves to the Firmware Install screen &lt;br&gt;This command is accepted but the screen is not moved.</td>
</tr>
<tr>
<td>SCREEN UTIL_INSTWV</td>
<td>✓</td>
<td>SCREEN UTIL_INSTWV</td>
<td>N/A</td>
<td>Moves to the Waveform Data License Install screen &lt;br&gt;This command is accepted but the screen is not moved.</td>
</tr>
</tbody>
</table>

| MG3710A/MG3740A Commands (SCPI mode) | |
|--------------------------------------| |
| SCREEN UTIL_INSTTOP | |
| SCREEN UTIL_INSTFRM | |
| SCREEN UTIL_INSTWV | |

| MG3710A/MG3740A Commands (SCPI mode) | |
|--------------------------------------| |
| SCREEN UTIL_INSTTOP | |
| SCREEN UTIL_INSTFRM | |
| SCREEN UTIL_INSTWV | |

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRMINST s</td>
<td>N/A</td>
<td>–</td>
<td>N/A</td>
<td>Firmware Install</td>
</tr>
<tr>
<td>INSTMEDIA HDD</td>
<td>CF</td>
<td>N/A</td>
<td>–</td>
<td>Install Source Media</td>
</tr>
<tr>
<td>INSTMEDIA?</td>
<td>N/A</td>
<td>–</td>
<td>N/A</td>
<td>Install Source Media</td>
</tr>
<tr>
<td>WVKEYNUM?</td>
<td>✓</td>
<td>WVKEYNUM?</td>
<td>N/A</td>
<td>Waveform Data License Number</td>
</tr>
<tr>
<td>WVKEYNAME? n</td>
<td>✓</td>
<td>WVKEYNAME? &lt;integer&gt;</td>
<td>N/A</td>
<td>Waveform Data License Name</td>
</tr>
<tr>
<td>WVKEYVER? s</td>
<td>✓</td>
<td>WVKEYVER? &lt;string&gt;</td>
<td>N/A</td>
<td>Waveform Data License Version</td>
</tr>
<tr>
<td>WVINSTMEDIA HDD</td>
<td>CF</td>
<td>✓</td>
<td>WVINSTMEDIA HDD</td>
<td>CF</td>
</tr>
<tr>
<td>WVINSTMEDIA?</td>
<td>✓</td>
<td>WVINSTMEDIA?</td>
<td>N/A</td>
<td>Waveform Data license Install Source Media</td>
</tr>
</tbody>
</table>

| MG3710A/MG3740A Commands (SCPI mode) | |
|--------------------------------------| |
| FIRMINST s | |
| INSTMEDIA HDD|CF | |
| INSTMEDIA? | |
| WVKEYNUM? | |
| WVKEYNAME? n | |
| WVKEYVER? s | |
| WVINSTMEDIA HDD|CF | |
| 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/MG3740A.

<table>
<thead>
<tr>
<th>MG3700A Commands</th>
<th>Com-</th>
<th>MG3710A/MG3740A Commands (MG3700 mode)</th>
<th>SG 1/2</th>
<th>Remarks</th>
<th>MG3700A/MG3740A Commands (SCPI mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>*CLS</td>
<td>√</td>
<td>*CLS</td>
<td>N/A</td>
<td>Clear Status Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*ESE</td>
<td>√</td>
<td>*ESE</td>
<td>N/A</td>
<td>Standard Event Status Enable Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*ESE?</td>
<td>√</td>
<td>*ESE?</td>
<td>N/A</td>
<td>Standard Event Status Enable Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*ESR?</td>
<td>√</td>
<td>*ESR?</td>
<td>N/A</td>
<td>Standard Event Status Register Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*IDN?</td>
<td>√</td>
<td>*IDN?</td>
<td>N/A</td>
<td>Identification Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*OPC</td>
<td>√</td>
<td>*OPC</td>
<td>N/A</td>
<td>Operation Complete Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*OPC?</td>
<td>√</td>
<td>*OPC?</td>
<td>N/A</td>
<td>Operation Complete Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*RST</td>
<td>√</td>
<td>*RST</td>
<td>N/A</td>
<td>Reset Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*SRE</td>
<td>√</td>
<td>*SRE</td>
<td>N/A</td>
<td>Service Request Enable Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*SRE?</td>
<td>√</td>
<td>*SRE?</td>
<td>N/A</td>
<td>Service Request Enable Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>MG3700A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (MG3700 mode)</td>
<td>SG 1/2</td>
<td>Remarks</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>*STB</td>
<td>√</td>
<td>*STB</td>
<td>N/A</td>
<td>Read Status Byte Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*TRG</td>
<td>√</td>
<td>*TRG</td>
<td>N/A</td>
<td>Trigger Command</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*TST?</td>
<td>√</td>
<td>*TST?</td>
<td>N/A</td>
<td>Self Test Query</td>
<td>Same as the compatible command</td>
</tr>
<tr>
<td>*WAI</td>
<td>√</td>
<td>*WAI</td>
<td>N/A</td>
<td>Wait to Continue Command</td>
<td>Same as the compatible command</td>
</tr>
</tbody>
</table>
Appendix G  SCPI Compatible Command

This appendix describes SCPI commands for signal generators supported by the MG3710A/MG3740A.

Supported signal generators

Agilent        N5162A/N5182A

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### G.1 Basic Function Commands

#### G.1.1 Correction Subsystem

Correction Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.1-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:CORRection:FLATness:INITialize:FSTep &quot;&lt;file name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:LOAD &lt;freq.&gt;[&lt;freq suffix&gt;],&lt;corr.&gt;[&lt;corr suffix&gt;]</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:CORRection:FLATness:LOAD &lt;string&gt;[,&lt;device&gt;]</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:PAIR &lt;freq.&gt;[&lt;freq suffix&gt;],&lt;corr.&gt;[&lt;corr suffix&gt;]</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:CORRection:FLATness:PAIR &lt;freq&gt;,&lt;rel_ampl&gt;</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:POIcnts?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:CORRection:FLATness:POIcnts?</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:PRESet</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:CORRection:FLATness:PRESet</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:POIcnts &lt;points&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:POIcnts?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:STARt &lt;freq&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:STARt?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:STOP &lt;freq&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STEP:STOP? [MAXimum</td>
<td>MINimum]</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:FLATness:STORe &quot;&lt;file name&gt;&quot;</td>
<td></td>
<td>[[:SOURce[1]</td>
<td>2]:CORRection:FLATness:STORe &lt;string&gt; [,&lt;device&gt;]}</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:CHANnel A</td>
<td>B</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:CHANnel?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate :LAN:DEVice &lt;deviceName&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate :LAN:DEVice?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate :LAN:IP &lt;ipAddress&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:LAN:IP?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:LAN:PORT &lt;portNumber&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:LAN:PORT?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:TYPE SOCKets</td>
<td>SOCKETS</td>
<td>VXI11</td>
<td>USB</td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:TYPE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:USB:DEVice &lt;device&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:USB:DEVice?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection:PMETer:COMMunicate:USB:LIST?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:CORRection[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:CORRection[:STATe]?</td>
<td>√</td>
<td>[[:SOURce[1]</td>
<td>2]:CORRection[:STATe]?</td>
</tr>
</tbody>
</table>
### G.1.2 Digital Modulation Subsystem

Digital Modulation Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.2-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:BURSt:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:BURSt:STATe?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:CORRection:OPTimizati on RFOut</td>
<td>EXTernal</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:DM:CORRection:OPTimizati on?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:INTernal:CHANnel:OPTimization EVM</td>
<td>ACP</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:DM:INTernal:CHANnel:OPTimization?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:INTernal:EQUalization:FILTER:SELECT &quot;Filter&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:INTernal:EQUalization:FILTER:STATE ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:DM:INTernal:EQUalization:FILTER:STATE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:DELay &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:DELay &lt;time&gt;</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:EXTernal:CMRange COARse</td>
<td>FINE</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
</tbody>
</table>
## Table G.1.2-1  Digital Modulation Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:DM:IQADjustment:EXTernal:COFFset &lt;value&gt;</td>
<td>√</td>
<td>[:SOURce[1]]:DM:IQADjustment:EXTernal:COFFset &lt;voltage&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:EXTernal:DIOFFset &lt;value&gt;</td>
<td>√</td>
<td>[:SOURce[1]]:DM:IQADjustment:EXTernal:DIOFFset &lt;voltage&gt;</td>
<td></td>
</tr>
</tbody>
</table>
### Table G.1.2-1  Digital Modulation Subsystem Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:DM:IQADjustment:EXTernal:QSKew &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:EXTernal:QSKew?</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:GAIN &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:GAIN &lt;rel_ampl&gt;</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:IOFFset &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:IOFFset &lt;percent&gt;</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:PHASe &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:PHASe &lt;phase&gt;</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:QOFFSET &lt;percent&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:QOFFSET &lt;percent&gt;</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment:SKEW &lt;value&gt;</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:DM:IQADjustment:SKEW &lt;value&gt;</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:DM:IQADjustment[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:DM:POLarity?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:DM:POLarity[:ALL]?</td>
</tr>
<tr>
<td>[:SOURce]:DM:SOURce EXTernal</td>
<td>INTernal</td>
<td>SUM</td>
<td>✓</td>
</tr>
<tr>
<td>[:SOURce]:DM:SOURce?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:DM:SOURce?</td>
</tr>
<tr>
<td>[:SOURce]:DM:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:DM:STATe?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### G.1.3 Frequency Subsystem

Frequency Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.3-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:FREQuency:CENTer &lt;num&gt;[&lt;freq_suffix&gt;]</td>
<td>√</td>
<td>[:SOURce[1]]:FREQuency:CENTer &lt;freq&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:CENTer? [MAXimum</td>
<td>MINimum]</td>
<td>√</td>
<td>[:SOURce[1]]:FREQuency:CENTer?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:CHANnels:BAND &lt;band&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:CHANnels:BAND &lt;band&gt;</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:CHANnels:NUMBer &lt;number&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:CHANnels:NUMBer &lt;integer&gt;</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:CHANnels[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:CHANnels[:STATe]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:CHANnels[:STATe]?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency[:CW] &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency[:CW]:FIXed &lt;freq&gt;</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency[:CW]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency[:CW]:FIXed?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:MODE CW</td>
<td>FIXed</td>
<td>LIST</td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:MODE?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:MODE?</td>
</tr>
</tbody>
</table>
### Table G.1.3-1  Frequency Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:FREQuency:MUlTiplier &lt;value&gt;</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:MUlTiplier &lt;ext_numeric&gt;</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:MUlTiplier?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:MUlTiplier?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:OFFSet &lt;value&gt;&lt;unit&gt;</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:OFFSet &lt;freq&gt;</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:OFFSet?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:OFFSet?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:OFFSet:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:REFerence &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:REFerence?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:REFerence:Set</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:REFerence:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:REFerence:STATe?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:REFerence:STATe?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:SPAN &lt;num&gt;&lt;freq_suffix&gt;</td>
<td>UP</td>
<td>DOWN</td>
<td>✓</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:SPAN? [MAXimum</td>
<td>MINimum]</td>
<td>✓</td>
<td>[:SOURce[1]]:FREQuency:SPAN?</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:START &lt;value&gt;&lt;unit&gt;</td>
<td>✓</td>
<td>[:SOURce[1]]:FREQuency:START &lt;freq&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:START?</td>
<td>✓</td>
<td>[:SOURce[1]]:FREQuency:START?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:STOP &lt;value&gt;&lt;unit&gt;</td>
<td>✓</td>
<td>[:SOURce[1]]:FREQuency:STOP &lt;freq&gt;</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:FREQuency:STOP?</td>
<td>√</td>
<td>[:SOURce[1]]:FREQuency:STOP?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:PHASE:REFERence</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:PHASE[:ADJust]</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:PHASE[:ADJust] &lt;ext_numeric&gt;</td>
</tr>
<tr>
<td>[:SOURce]:PHASE[:ADJust]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:PHASE[:ADJust]?</td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:BANDwidth:EXTERNAL &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:BANDwidth:EXTERNAL?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:FREQuency:EXTERNAL &lt;freq&gt;</td>
<td>√</td>
<td>[:SOURce]:ROSCillator:FREQuency:EXTERNAL &lt;freq&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:FREQuency:EXTERNAL?</td>
<td>√</td>
<td>[:SOURce]:ROSCillator:FREQuency:EXTERNAL?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:SOURce?</td>
<td>√</td>
<td>[:SOURce]:ROSCillator:SOURce?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:SOURce:AUTO ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:ROSCillator:SOURce:AUTO?</td>
<td>√</td>
<td>[:SOURce]:ROSCillator:SOURce:AUTO?</td>
<td></td>
</tr>
</tbody>
</table>
### G.1.4 List/Sweep Subsystem

List/Sweep Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.4-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:LIST:CPOint?</td>
<td>√</td>
<td>[:SOURce]:LIST:CPOint?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:DIREction UP</td>
<td>DOWN</td>
<td>√</td>
<td>[:SOURce]:LIST:DIREction UP</td>
</tr>
<tr>
<td>[:SOURce]:LIST:DIREction?</td>
<td>√</td>
<td>[:SOURce]:LIST:DIREction?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:DWELL &lt;value&gt;{,&lt;value&gt;}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:DWELL?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:DWELL:POINTS?</td>
<td>√</td>
<td>[:SOURce]:LIST:DWELL:POINTS?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:DWELL:TYPE LIST</td>
<td>STEP</td>
<td>√</td>
<td>[:SOURce]:LIST:DWELL:TYPE LIST</td>
</tr>
<tr>
<td>[:SOURce]:LIST:DWELL:TYPE?</td>
<td>√</td>
<td>[:SOURce]:LIST:DWELL:TYPE?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:FREQuency &lt;value&gt;{,&lt;value&gt;}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:FREQuency?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:FREQuency:POINTS?</td>
<td>√</td>
<td>[:SOURce]:LIST:FREQuency:POINTS?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:MANual &lt;value&gt;</td>
<td>UP</td>
<td>DOWN</td>
<td>√</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:LIST:MANual?</td>
<td>✓</td>
<td>[:SOURce]:LIST:MANual?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:MODE AUTO</td>
<td>MANual</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:MODE?</td>
<td>✓</td>
<td>[:SOURce]:LIST:MODE?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:OPTions &lt;val&gt;{,&lt;val&gt;}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:OPTions?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:OPTions:POINts?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:POWer &lt;value&gt;{,&lt;value&gt;}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:POWer?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:POWer:POINts?</td>
<td>✓</td>
<td>[:SOURce]:LIST:POWer:POINts?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:RETRace ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:LIST:RETRace?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:TRIGger:SOURce BUS</td>
<td>IMMediate</td>
<td>EXTernal</td>
<td>KEY</td>
</tr>
<tr>
<td>[:SOURce]:LIST:TRIGger:SOURce?</td>
<td>✓</td>
<td>[:SOURce]:LIST:TRIGger:SOURce?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:TYPE LIST</td>
<td>STEP</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:TYPE?</td>
<td>✓</td>
<td>[:SOURce]:LIST:TYPE?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:TYPE:LIST:INITialize:FS tep</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
Table G.1.4-1  List/Sweep Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:LIST:WAVeform &lt;name&gt;{,&lt;name&gt;}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:WAVeform?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:LIST:WAVeform:POINts?</td>
<td>√</td>
<td>[:SOURce]:LIST:WAVeform:POINts?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:CPOint?</td>
<td>√</td>
<td>[:SOURce]:SWEep:CPOint?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:DWELL &lt;value&gt;</td>
<td>√</td>
<td>[:SOURce][1][2]:SWEep:DWELL &lt;time&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:DWELL?</td>
<td>√</td>
<td>[:SOURce][1][2]:SWEep:DWELL?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:POINts &lt;value&gt;</td>
<td>√</td>
<td>[:SOURce][1][2]:SWEep:POINts &lt;value&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:POINts?</td>
<td>√</td>
<td>[:SOURce][1][2]:SWEep:POINts?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:SWEep:SPACing LINear</td>
<td>LOGarithmic</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:SWEep:SPACing?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
G.1.5 Fast Subsystem

Fast Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.5-1.

Table G.1.5-1  Fast Subsystem Device Messages

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:FAST:FP &lt;Freq mHz&gt;, &lt;power dB&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:FAST:FREQuency &lt;Freq mHz&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:FAST:POWer &lt;power dB&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
</tbody>
</table>
### Table G.1.6-1 Marker Subsystem Device Messages

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:MARKer:AMPLitude[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:MARKer:AMPLitude[:STATe] ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:AMPLitude:VALue &lt;num&gt;[DB]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:AMPLitude:VALue?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:AOFF</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:DELTa? &lt;num&gt;,&lt;num&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19]:FREQuency &lt;val&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19]:FREQuency? MAXimum</td>
<td>MINimum</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:MARKer:MODE FREQuency</td>
<td>DELTa</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:MARKer:MODE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:REFerence &lt;marker&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer:REFerence?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19][:STATe] ON</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:MARKer[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19][:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### G.1.7 Power Subsystem

Power Subsystem device messages available in MG3710A/MG3740A are shown in Table G.1.7-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:POWer:ALC:BWIDth&lt;num&gt;{freq suffix}</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:BWIDth?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:BWIDth:AUTO ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:BWIDth:AUTO?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARCH AUTO</td>
<td>SPAN</td>
<td>ON</td>
<td>1</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:LEVEL &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:LEVEL?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARCH:REFERence RMS</td>
<td>FIXed</td>
<td>MANual</td>
<td>MODulated</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARCH:REFERence?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
Table G.1.7-1  Power Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:REFerence:LEVel &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:REFerence:LEVel?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:START &lt;value&gt;&lt;units&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:START?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:STOP &lt;value&gt;&lt;units&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:STOP?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:TYPE FULL</td>
<td>USER</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN:TYPE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN[:STATe]</td>
<td>ON</td>
<td>OFF</td>
<td>1</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SEARch:SPAN[:STATe ]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### Table G.1.7-1  Power Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:POWer:ALC:SOURce INTernal</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SOURce?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SOURce:EXTernal:CO UPling &lt;value&gt;DB</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ALC:SOURce:EXTernal:CO UPling?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:[STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:[STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation:AUTO ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation:AUTO?</td>
<td>√</td>
<td>[:SOURce]:POWer:ATTenuation:AUTO?</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation:BYPass ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:ATTenuation:BYPass?</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:POWer[:LEVEL][:IMMediate]:OFFSet &lt;value&gt;&lt;unit&gt;</td>
<td>✓</td>
<td>[:SOURce][1]</td>
<td>2]:POWer[:LEVEL][:IMMediate]:OFFSet &lt;rel_ampl&gt;</td>
</tr>
<tr>
<td>[:SOURce]:POWer[:LEVEL][:IMMediate]:OFFSet?</td>
<td>✓</td>
<td>[:SOURce][1]</td>
<td>2]:POWer[:LEVEL][:IMMediate]:OFFSet?</td>
</tr>
<tr>
<td>[:SOURce]:POWer[:LEVEL][:IMMediate][:AMPLitude] &lt;value&gt;&lt;unit&gt;</td>
<td>✓</td>
<td>[:SOURce][1]</td>
<td>2]:POWer[:LEVEL][:IMMediate][:AMPLitude] &lt;ampl&gt;</td>
</tr>
<tr>
<td>[:SOURce]:POWer[:LEVEL][:IMMediate][:AMPLitude]?</td>
<td>✓</td>
<td>[:SOURce][1]</td>
<td>2]:POWer[:LEVEL][:IMMediate][:AMPLitude]?</td>
</tr>
<tr>
<td>[:SOURce]:POWer:MINimum:LIMit LOW</td>
<td>HIGH</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:POWer:MINimum:LIMit?</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:POWer:MODE FIXed</td>
<td>LIST</td>
<td>✓</td>
<td>[:SOURce][1]</td>
</tr>
</tbody>
</table>
### Table G.1.7-1  Power Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:POWer:NOISe:[STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:NOISe:[STATe]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:POWer:NOISe:[STATe]?</td>
</tr>
<tr>
<td>[:SOURce]:POWer:PROTection[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:PROTection[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:REFerence &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:REFerence?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:POWer:REFerence?</td>
</tr>
<tr>
<td>[:SOURce]:POWer:REFerence:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:POWer:REFerence:STATe?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:POWer:REFerence:STATe?</td>
</tr>
<tr>
<td>[:SOURce]:POWer:STARt &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]]:POWer:STARt &lt;ampl&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:STARt?</td>
<td>√</td>
<td>[:SOURce[1]]:POWer:STARt?</td>
<td></td>
</tr>
</tbody>
</table>
Table G.1.7-1  Power Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:POWer:STOP &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce[1]]:POWer:STOP &lt;ampl&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:STOP?</td>
<td>√</td>
<td>[:SOURce[1]]:POWer:STOP?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:POWer:USER:ENABle &lt;0</td>
<td>1&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
### G.2 System Commands

#### G.2.1 Calibration Subsystem

Calibration Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.1-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:CALibration:ALC:MODulator:BIAS</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:BBG:CHANnel</td>
<td>√</td>
<td>:CALibration:BBG:CHANnel</td>
<td></td>
</tr>
<tr>
<td>:CALibration:BBG:SKEW RFOut</td>
<td>EXTernal, &lt;value in pS&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:CALibration:BBG:SKEW? RFOut</td>
<td>EXTernal</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:CALibration:BBG:RFOut</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:DCFM</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:IQ:START &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:IQ:START?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:IQ:STOP &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:CALibration:IQ:STOP?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>:CALibration:IQ[:USER]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### G.2.2 Communication Subsystem

Communication Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.2-1.

**Table G.2.2-1 Communication Subsystem Device Messages**

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:SYSTem:CAPability?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:ERRor:C0De[:NEXT]?</td>
<td>✓</td>
<td>:SYSTem:ERRor:C0De[:NEXT]?</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:ERRor[:NEXT]?</td>
<td>✓</td>
<td>:SYSTem:ERRor[:NEXT]?</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:CONFig DHCP</td>
<td>MANual</td>
<td>AUTO</td>
<td>AIP</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:CONFig?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DEFaults</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DESCription &lt;string&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DHCP:TIMEout (30)</td>
<td>60</td>
<td>90</td>
<td>120sec</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DOMain &lt;string&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------</td>
<td>---------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DNS:DYNamic</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DNS:OVERride</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DNS[:SERVer]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>&lt;ipstring&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:DNS[:SERVer]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:GATeway</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>&quot;&lt;ipstring&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:HOSTname</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>&quot;&lt;string&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:HOSTname?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:IDENTify</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:IP &quot;&lt;ipstring&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:KEEP:TIMEout</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>&lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:KEEP[:STATe]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Table G.2.2-1  Communication Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:SYSTem:COMMunicate:LAN:KEEP[:STATe]?</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:MDNS ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:MONitor ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:NBIos ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:NBIos?</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:RESTart</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:LAN:SUBNet &quot;&lt;ipstring&gt;&quot;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:PMETer:DEVice &lt;deviceName&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:PMETer:DEVice?</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:PMETer:IP &lt;ipaddr&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:PMETer:PORT &lt;portNum&gt;</td>
<td>N/A</td>
<td></td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:COMMunicate:PMETer:TYPE SOCKets</td>
<td>SOCKETS</td>
<td>VXI11</td>
<td>USB</td>
</tr>
</tbody>
</table>
## G.2.3 Display Subsystem

Display Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.3-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:DISPlay:ANNotation:AMPLitude[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:DISPlay:ANNotation:AMPLitude[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:ANNotation:FREQuency[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:DISPlay:ANNotation:FREQuency[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:ANNotation:CLOCk:DATE:FORMat MDY</td>
<td>DMY</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:DISPlay:ANNotation:CLOCk:DATE:FORMat?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:ANNotation:CLOCk[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:DISPlay:ANNotation:CLOCk[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:BRIGHTness &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:BRIGHTness?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:CAPTure</td>
<td>√</td>
<td>:MMEMory:STORe:SCReen [&lt;filename&gt;][,&lt;device&gt;]</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:CMAP:DEFault [&lt;palette:{BRIGHT}</td>
<td>DARK</td>
<td>MONOchrome&gt;]</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table G.2.3-1 Display Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:DISPlay:CONTrast &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:CONTrast?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:DISPlay:REMote ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:DISPlay:REMote?</td>
<td>✓</td>
<td>:DISPlay:ENABle?</td>
<td></td>
</tr>
<tr>
<td>:DISPlay[:WINDow][:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:DISPlay[:WINDow][:STATe]?</td>
<td>✓</td>
<td>:DISPlay:ENABle?</td>
<td></td>
</tr>
</tbody>
</table>
### IEEE 488.2 Common Commands

IEEE 488.2 Common Commands device messages available in MG3710A/MG3740A are shown in Table G.2.4-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>*CLS</td>
<td>✓</td>
<td>*CLS</td>
<td></td>
</tr>
<tr>
<td>*ESE &lt;data&gt;</td>
<td>✓</td>
<td>*ESE &lt;integer&gt;</td>
<td></td>
</tr>
<tr>
<td>*ESE?</td>
<td>✓</td>
<td>*ESE?</td>
<td></td>
</tr>
<tr>
<td>*ESR?</td>
<td>✓</td>
<td>*ESR?</td>
<td></td>
</tr>
<tr>
<td>*IDN?</td>
<td>✓</td>
<td>*IDN?</td>
<td></td>
</tr>
<tr>
<td>*OPC</td>
<td>✓</td>
<td>*OPC</td>
<td></td>
</tr>
<tr>
<td>*OPC?</td>
<td>✓</td>
<td>*OPC?</td>
<td></td>
</tr>
<tr>
<td>*OPT?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*PSC ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>*PSC?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*RCL &lt;reg&gt;,&lt;seq&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*RST</td>
<td>✓</td>
<td>*RST</td>
<td></td>
</tr>
<tr>
<td>*SAV &lt;reg&gt;,&lt;seq&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*SRE &lt;data&gt;</td>
<td>✓</td>
<td>*SRE &lt;integer&gt;</td>
<td></td>
</tr>
<tr>
<td>*SRE?</td>
<td>✓</td>
<td>*SRE?</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>*STB?</td>
<td>√</td>
<td>*STB?</td>
<td></td>
</tr>
<tr>
<td>*TRG</td>
<td>√</td>
<td>*TRG</td>
<td></td>
</tr>
<tr>
<td>*TST?</td>
<td>√</td>
<td>*TST?</td>
<td></td>
</tr>
<tr>
<td>*WAI</td>
<td>√</td>
<td>*WAI</td>
<td></td>
</tr>
</tbody>
</table>
### G.2.5 Memory Subsystem

Memory Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.5-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:MEMory:CATalog:BINary?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:FIR?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:FSK?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:IQ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:LIST?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:MDMod?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:MTOne?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:PTrain?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:SEQ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:STATE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog:UFLT?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog[:ALL]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA &quot;&lt;file_name&gt;&quot;,&lt;data_block&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>:MEMory:DATA? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA:APPend &quot;&lt;file_name&gt;&quot; ,&lt;data_block&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA:FIR &quot;&lt;file_name&gt;&quot; ,REAL</td>
<td>COM</td>
<td>plex</td>
<td>osr</td>
</tr>
<tr>
<td>:MEMory:DATA:FIR? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA:FSK &quot;&lt;file_name&gt;&quot; ,&lt;num_states&gt; ,f0</td>
<td>,f1</td>
<td>,...</td>
<td>f(n)&gt;[ ,&lt;diff_state&gt; ,&lt;num_diff_states&gt; ,&lt;diff1&gt; ,...&lt;diff(n)&gt;]</td>
</tr>
<tr>
<td>:MEMory:DATA:FSK? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA:IQ &quot;&lt;file_name&gt;&quot; ,&lt;offsetQ&gt; ,&lt;num_states&gt; ,&lt;i0&gt; ,q0&gt;</td>
<td>,&lt;i1&gt; ,q1&gt; ,...&lt;i(n)&gt; ,q(n)&gt;[ ,&lt;diff_state&gt; ,&lt;num_diff_states&gt; ,&lt;diff0&gt; ,&lt;diff1&gt; ,...&lt;diff(n)&gt;]</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:MEMory:DATA:IQ? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:ALL</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:BINary</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:DMOD</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:FIR</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:LIST</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELETE:MDMod</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>:MEMory:DELeTe:MTOne</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELeTe:PTRain</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELeTe:SEQ</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELeTe:STATe</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELeTe:UFLT</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELeTe[:NAME]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:EXPort[:ASCii]:PTRAin &lt;&quot;filename&quot;&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:EXPort[:ASCii]:SEParator:COLumn TAB</td>
<td>SEMicolon</td>
<td>COMMa</td>
<td>SPACE</td>
</tr>
<tr>
<td>:MEMory:EXPort[:ASCii]:SEParator:COLumn ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:EXPort[:ASCii]:SEParator:DEcima l DOT</td>
<td>COMMa</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:MEMory:EXPort[:ASCii]:SEParator:DEcimal ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:IMPort[:ASCii]:PTRAin &lt;&quot;filename&quot;&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:IMPort[:ASCii]:SEParator:DEcima l DOT</td>
<td>COMMa</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:MEMory:IMPort[:ASCii]:SEParator:DEcimal ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:LOAD:LIST &quot;&lt;file name&gt;&quot;</td>
<td>√</td>
<td>:MEMory:LOAD:LIST &lt;string&gt;[,&lt;device&gt;]</td>
<td></td>
</tr>
<tr>
<td>:MEMory:MOVE &quot;&lt;src_file&gt;&quot;,&quot;&lt;dest_file&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>:MEMory:SIZE? &quot;&lt;filename&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:STATE:COMMent `&lt;reg_num&gt;,&lt;seq_num&gt;&quot;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:STATE:COMMent? `&lt;reg_num&gt;,&lt;seq_num&gt;&quot;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CATalog? &quot;&lt;msus&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA &quot;&lt;file name&quot;&quot;,&lt;datablock&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DATA? &quot;&lt;file name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELe:NVWFm</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELe:WFM</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:DELe[:NAME] &quot;&lt;file name&quot;&quot;,[&quot;&lt;msus&gt;&quot;]</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:HEADer:CLEar &quot;&lt;file name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:HEADer:DESCRIPTION &quot;&lt;file name&quot;&quot;,&quot;&lt;description&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:HEADer:DESCRIPTION? &quot;&lt;file name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:HEADer:ID? &quot;&lt;file name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:LOAD:LIST &quot;&lt;file name&gt;&quot;</td>
<td>✓</td>
<td>:MEMory:LOAD:LIST &lt;string&gt;[,&lt;device&gt;]</td>
<td></td>
</tr>
<tr>
<td>:MEMory:LOAD:PTRain &quot;&lt;filename&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>:MMEMory:MOVE &quot;&lt;src_file&gt;&quot;&quot;,&quot;&lt;dest_file&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MMEMory:STORe:LIST &quot;&lt;file name&gt;&quot;</td>
<td>√</td>
<td>:MMEMory:STORe:LIST &lt;string&gt;[,&lt;device&gt;]</td>
<td></td>
</tr>
<tr>
<td>:MMEMory:STORe:PTRain &lt;&quot;filename&quot;&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MMEMory:STORe:WFM:ALL</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SANalyzer:COMMunicate:LAN:DEVi ce &lt;deviceName&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SANalyzer:COMMunicate:LAN:DEVi ce?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SANalyzer:COMMunicate:LAN:PORT &lt;portNum&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SANalyzer:COMMunicate:TYPE SOCKets</td>
<td>SOCKETS</td>
<td>VXI11</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### G.2.6 Output Subsystem

Output Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.6-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:OUTPut:BLANKing:AUTO ON</td>
<td>N/A</td>
<td>:OUTPut:BLANKing:AUTO</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:OUTPut:BLANKing:STATe ON</td>
<td>N/A</td>
<td>:OUTPut:BLANKing:STATe</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:OUTPut:MODulation[:STATe]?</td>
<td>✓</td>
<td>:OUTPut:MODulation[:STATe]?</td>
<td></td>
</tr>
<tr>
<td>:OUTPut:PROTection[:STATe] ON</td>
<td>N/A</td>
<td>:OUTPut:PROTection[:STATe]</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:OUTPut:PROTection[:STATe]?</td>
<td>N/A</td>
<td>:OUTPut:PROTection[:STATe]?</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:OUTPut[:STATe] ON</td>
<td>✓</td>
<td>:OUTPut[:STATe]</td>
<td></td>
</tr>
<tr>
<td>:OUTPut[:STATe]?</td>
<td>✓</td>
<td>:OUTPut[:STATe]?</td>
<td></td>
</tr>
</tbody>
</table>
## G.2.7 Route Subsystem

Route Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.7-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:ROUTe[:CONNectors]:EVENt1 M1</td>
<td>M2</td>
<td>M3</td>
<td>M4</td>
</tr>
<tr>
<td>:ROUTe[:CONNectors]:EVENt1?</td>
<td>√</td>
<td>:ROUTe[:CONNectors]:EVENt1</td>
<td>2</td>
</tr>
<tr>
<td>:ROUTe[:CONNectors]:SOUT SWEep</td>
<td>SETTled</td>
<td>PVIDeo</td>
<td>SW8757</td>
</tr>
<tr>
<td>:ROUTe[:CONNectors]:SOUT?</td>
<td>√</td>
<td>:ROUTe[:CONNectors]:SOUT?</td>
<td></td>
</tr>
<tr>
<td>:ROUTe[:CONNectors]:TOUT SWEep</td>
<td>SETTled</td>
<td>PVIDeo</td>
<td>PSYNc</td>
</tr>
<tr>
<td>:ROUTe[:CONNectors]:TOUT?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### Status Subsystem

Status Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.8-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:STATus:OPERation:CONDition?</td>
<td>✓</td>
<td>:STATus:OPERation:CONDition?</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:ENABle &lt;value&gt;</td>
<td>✓</td>
<td>:STATus:OPERation:ENABle &lt;integer&gt;</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:ENABle?</td>
<td>✓</td>
<td>:STATus:OPERation:ENABle?</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:NTRansition &lt;value&gt;</td>
<td>✓</td>
<td>:STATus:OPERation:NTRansition &lt;integer&gt;</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:NTRansition?</td>
<td>✓</td>
<td>:STATus:OPERation:NTRansition?</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:PTransition &lt;value&gt;</td>
<td>✓</td>
<td>:STATus:OPERation:PTransition &lt;integer&gt;</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:PTransition?</td>
<td>✓</td>
<td>:STATus:OPERation:PTransition?</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>:STATus:OPERation:SUPPress 0</td>
<td>1</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>:STATus:OPERation[:EVENT]?</td>
<td>✓</td>
<td>:STATus:OPERation[:EVENT]?</td>
<td>The layout of the register is that of the MG3710A/MG3740A.</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------</td>
<td>-------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>:STATus:PRESet</td>
<td>✓</td>
<td>:STATus:PRESet</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:CONDITION?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:ENABLE &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:ENABLE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:NTRansition &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:NTRansition?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:PTRansition &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration:PTRansition?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CALibration[:EVENT]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CONDITION?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:ENABLE &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:ENABLE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:FREQuency:CONDITION?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:FREQuency:ENABLE &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:FREQuency:ENABLE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:FREQuency:NTRansition &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:FREQuency:NTRansition?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>---------------</td>
<td>-------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>:STATus:QUEStionable:FREQuency:PTRansition &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUEStionable:FREQuency:PTRansition?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUEStionable:FREQuency[:EVENT]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### System Subsystem

System Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.9-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:SYSTem:DATE &lt;year&gt;,&lt;month&gt;,&lt;day&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:DATE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:ERRor:CODE[:NEXt]?</td>
<td>☑</td>
<td>:SYSTem:ERRor:CODE[:NEXt]?</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:ERRor[:NEXt]?</td>
<td>☑</td>
<td>:SYSTem:ERRor[:NEXt]?</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:ERRor:SCPI[:SYNTax] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:ERRor:SCPI[:SYNTax]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:FILESystem:STORage:EXTernal:PATH &quot;USB media root path&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:FILESystem:STORage:TYPE INTERNAL</td>
<td>EXTERNAL</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:FILESystem:STORage:TYPE:AUTO ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:IDN &quot;string&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### Table G.2.9-1 System Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:SYSTem:LANGuage &quot;SCPI&quot;</td>
<td>√</td>
<td>:SYSTem:LANGuage &quot;SCPI&quot;</td>
<td></td>
</tr>
<tr>
<td>&quot;COMP&quot;</td>
<td>&quot;E4428C&quot;</td>
<td>&quot;E4438C&quot;</td>
<td>&quot;E8257D&quot;</td>
</tr>
<tr>
<td>:SYSTem:LANGuage?</td>
<td>√</td>
<td>:SYSTem:LANGuage?</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense:AUS[:DATE]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense:EXTernal:LIST?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense:[FPACK]:WAVEform:ADD &quot;filename&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:CLEar &lt;slot_number&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:FREE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:IDList ?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:LOCK slot_number</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:REPlac e slot_number, &quot;filename&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:STATus ? slot_number</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense[:FPACK]:WAVEform:USED?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:LICense:INSTall &lt;license_line&gt;</td>
<td>&lt;block_of_license_lines&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:LICense:LIST?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### Table G.2.9-1  System Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:SYSTem:LICense:REMove &lt;license_line&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:OPT &quot;string&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:PDOWn</td>
<td>√</td>
<td>:SYSTem:PDOWn</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:PMETer[1]</td>
<td>2:CHANnel A</td>
<td>B</td>
<td>N/A</td>
</tr>
<tr>
<td>:SYSTem:PMETer[1]</td>
<td>2:COMMunicate:LAN:DEV ice &lt;deviceName&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>:SYSTem:PMETer[1]</td>
<td>2:SENSe:AVERage:COUNT:AUTO ON</td>
<td>OFF</td>
<td>1</td>
</tr>
<tr>
<td>:SYSTem:PReSet</td>
<td>√</td>
<td>:SYSTem:PReSet</td>
<td>Executes preset</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>-----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>:SYSTem:PRESet:ALL</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:PRESet:LANGuage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;SCPI&quot;</td>
<td>&quot;CMP&quot;</td>
<td>&quot;6648&quot;</td>
<td>&quot;E4428C&quot;</td>
</tr>
<tr>
<td>:SYSTem:PRESet:PERSistent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:SYSTem:PRESet:FN9 NORMAL</td>
<td>QUICK</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:PRESet:TYPE NORMAL</td>
<td>USER</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:PRESet:USER</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYSTem:PRESet[[:USER]]:SAVE</td>
<td></td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYSTem:SECurity:DISPlay ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:SECurity:DISPlay?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SECurity:DISPlay:RESTricted ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYSTem:SECurity:DISPlay:RESTricted?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SECurity:ERASeall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:SYSTem:SECurity:LEVel NONE</td>
<td>ERASe</td>
<td>OVERwrite</td>
<td>SANitize</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>:SYStem:SECurity:LEVel?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SECurity:LEVel:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYStem:SECurity:LEVel:STATe?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SECurity:OVERwrite</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SECurity:SANitize</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SSAVer:DELay &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SSAVer:DELay?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SSAVer:MODE LIGHT</td>
<td>TEXT</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYStem:SSAVer:MODE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:SSAVer:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:SYStem:SSAVer:STATe?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:TIME &lt;hour&gt;,&lt;minute&gt;,&lt;second&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:TIME?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:VERSion?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:VERSion?</td>
<td>√</td>
<td>:SYStem:VERSion?</td>
<td></td>
</tr>
</tbody>
</table>


G.2.10 Trigger Subsystem

Trigger Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.10-1.

Table G.2.10-1  Trigger Subsystem Device Messages

<table>
<thead>
<tr>
<th>NS162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:ABORt</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:INITiate:CONTinuous[:ALL] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>:INITiate:CONTinuous[:ALL]?</td>
<td>√</td>
<td>:INITiate:CONTinuous[:ALL]?</td>
<td></td>
</tr>
<tr>
<td>:INITiate[:IMMediate][:ALL]</td>
<td>√</td>
<td>:INITiate[:IMMediate][:ALL]</td>
<td></td>
</tr>
<tr>
<td>:TRIGger:OUTPut:POLarity POSitive</td>
<td>NEGative</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:TRIGger:OUTPut:POLarity?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:SLOPe POSitive</td>
<td>NEGative</td>
<td>√</td>
<td>:TRIGger[1]</td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:SLOPe?</td>
<td>√</td>
<td>:TRIGger[1]</td>
<td>2[:SEQuence]:SLOPe?</td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:SOURce BUS</td>
<td>IMMediate</td>
<td>EXTernal</td>
<td>KEY</td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:SOURce?</td>
<td>√</td>
<td>:TRIGger[1]</td>
<td>2[:SEQuence]:SOURce?</td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:TIMer &lt;period&gt;</td>
<td>√</td>
<td>:TRIGger[:SEQuence]:TIMer &lt;time&gt;</td>
<td></td>
</tr>
<tr>
<td>:TRIGger[:SEQuence]:TIMer?</td>
<td>√</td>
<td>:TRIGger[:SEQuence]:TIMer?</td>
<td></td>
</tr>
<tr>
<td>:TRIGger[:SEQuence][:IMMediate]</td>
<td>√</td>
<td>:TRIGger[:SEQuence][:IMMediate]</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:TSWeep</td>
<td>√</td>
<td>[:SOURce]:TSWeep</td>
<td></td>
</tr>
</tbody>
</table>
## G.2.11 Unit Subsystem

Unit Subsystem device messages available in MG3710A/MG3740A are shown in Table G.2.11-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:UNIT:VOLT:TYPE PD</td>
<td>EMF</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:UNIT:VOLT:TYPE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### G.3 Analog Modulation Commands

#### G.3.1 Amplitude Modulation Subsystem

Amplitude Modulation Subsystem device messages available in MG3710A/MG3740A are shown in Table G.3.1-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A[:SOURce]:AM:EXTernal:COUPling AC</td>
<td>DC</td>
<td>✓</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>[:SOURce]:AM:INTernal:FREQuency &lt;value&gt;&lt;unit&gt;</td>
<td>UP</td>
<td>DOWN</td>
<td>✓</td>
</tr>
<tr>
<td>[:SOURce]:AM:MODE DEEP</td>
<td>NORMAL</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:AM:MODE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:AM:SOURce INT</td>
<td>EXT</td>
<td>✓</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>[:SOURce]:AM:SOURce?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:AM[[:AM[1]</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:AM:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:AM:TYPE LINear</td>
<td>EXPonential</td>
<td>✓</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>[:SOURce]:AM:TYPE?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:AM:TYPE?</td>
</tr>
<tr>
<td>[:SOURce]:AM[1]</td>
<td>2[:DEPTh]:STEP[:INCRement] &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:AM[1]</td>
<td>2[:DEPTh]:STEP[:INCRement]?</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:AM[1]</td>
<td>2[:DEPTh][:LINear]?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
## G.3.2 Frequency Modulation Subsystem

Frequency Modulation Subsystem device messages available in MG3710A/MG3740A are shown in Table G.3.2-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:FM:EXTernal:COUPling AC</td>
<td>DC</td>
<td>✓</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>[:SOURce]:FM:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:FM[:DEViation]?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:FM[1]</td>
</tr>
</tbody>
</table>
### Table G.3.2-1  Frequency Modulation Subsystem Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:FM[:DEViation]:STEP[:INCRement] &lt;value&gt;&lt;unit&gt;</td>
<td>GHz</td>
<td>MHz</td>
<td>kHz</td>
</tr>
</tbody>
</table>
### G.3.3 Phase Modulation Subsystem

Phase Modulation Subsystem device messages available in MG3710A/MG3740A are shown in Table G.3.3-1.

#### Table G.3.3-1  Phase Modulation Subsystem Device Messages

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:PM:BANDwidth</td>
<td>N/A</td>
<td>[:SOURCE[1]</td>
<td>2]:PM:BANDwidth</td>
</tr>
<tr>
<td>[:SOURce]:PM:EXTernal:COUPling AC</td>
<td>DC</td>
<td>[:SOURCE[1]</td>
<td>2]:PM:EXTernal:COUPling AC</td>
</tr>
<tr>
<td>[:SOURce]:PM:SOURce INT</td>
<td>EXT</td>
<td>√</td>
<td>[:SOURCE[1]</td>
</tr>
<tr>
<td>[:SOURce]:PM:SOURce?</td>
<td>√</td>
<td>[:SOURCE[1]</td>
<td>2]:PM:[PM[1]</td>
</tr>
<tr>
<td>[:SOURce]:PM:STATE ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
### Table G.3.3-1  Phase Modulation Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:PM[:DEVIation] &lt;value&gt;&lt;unit&gt;</td>
<td></td>
<td>[:SOURce][1]</td>
<td>2]:PM[:DEVIation] &lt;ext_numeric&gt;</td>
</tr>
<tr>
<td>[:SOURce]:PM[:DEVIation]?</td>
<td></td>
<td>[:SOURce][1]</td>
<td>2]:PM[:DEVIation]?</td>
</tr>
<tr>
<td>[:SOURce]:PM[:DEVIation]:STEP[:INCREmen] &lt;value&gt;&lt;unit&gt;</td>
<td></td>
<td>[:SOURce]:PM[:DEVIation]:STEP[:INCREmen] &lt;value&gt;&lt;unit&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:PM[:DEVIation]:STEP[:INCREmen]?</td>
<td></td>
<td>[:SOURce]:PM[:DEVIation]:STEP[:INCREmen]?</td>
<td></td>
</tr>
</tbody>
</table>
### G.3.4 Pulse Modulation Subsystem

Pulse Modulation Subsystem device messages available in MG3710A/MG3740A are shown in Table G.3.4-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:PULM:EXTernal:POLarity</td>
<td>✓</td>
<td>[:SOURce]:PULM:EXTernal:POLarity</td>
<td>Normal</td>
</tr>
<tr>
<td>[:SOURce]:PULM:EXTernal:POLarity?</td>
<td>✓</td>
<td>[:SOURce]:PULM:EXTernal:POLarity?</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:FREQuency &lt;frequency&gt;</td>
<td>MAXimum</td>
<td>MINimum</td>
<td>UP</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:PERiod &lt;period&gt;</td>
<td>MAXimum</td>
<td>MINimum</td>
<td>UP</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:PERiod:STEP[:INCREMENT] &lt;step&gt;</td>
<td>UP</td>
<td>DOWN</td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:PERiod:STEP[:INCREMENT]?</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:PWIDth:STEP &lt;num&gt;&lt;time_suffix&gt;</td>
<td>MAXimum</td>
<td>MINimum</td>
<td>DEFa ult</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:PWIDth:STEP?</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:LIST:PRESet</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:OFFTime &lt;value&gt;{,&lt;value&gt;}</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:OFFTime?</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:ONTime &lt;value&gt;{,&lt;value&gt;}</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:ONTime?</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:REPetition &lt;value&gt;{,&lt;value&gt;}</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal:TRAin:REPetition?</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal[1]:VIDeo:POLarity NORMAL</td>
<td>INVerted</td>
<td>√</td>
<td>[:SOURce]:PULM:INTernal[1]:VIDeo:POLarity NORMAL</td>
</tr>
<tr>
<td>[:SOURce]:PULM:INTernal[1]:VIDeo:POLarity?</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:PULM:SOURce INTernal</td>
<td>EXTernal</td>
<td>√</td>
<td>[:SOURce][1]</td>
</tr>
</tbody>
</table>
### Pulse Modulation Subsystem Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:PULM:SOURce?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:PULM:SOURce?</td>
</tr>
<tr>
<td>[:SOURce]:PULM:SOURce:INTernal</td>
<td></td>
<td>[:SOURce[1]</td>
<td>2]:PULM:SOURce:INTernal</td>
</tr>
<tr>
<td>SQUare</td>
<td>FRUN</td>
<td>TRIGgered</td>
<td>ADOublet</td>
</tr>
<tr>
<td>[:SOURce]:PULM:STATe ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:PULM:STATe?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:PULM:STATe?</td>
</tr>
</tbody>
</table>
All subsystem device messages available in MG3710A/MG3740A are shown in Table G.4.1-1.

Table G.4.1-1  All Subsystem Device Messages

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
</table>
## G.4.2 Dual ARB Subsystem

Dual ARB subsystem device messages available in MG3710A/MG3740A are shown in Table G.4.2-1.

### Table G.4.2-1  Dual ARB Subsystem Device Messages

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:ARB:BASEband:FREQuency:OFFSet:PHASe:RESet</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:CLIPping &quot;&lt;filename&quot;&gt;,IJQ</td>
<td>IQRQ,&lt;value&gt;[,&lt;value&gt;]</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:DOPRotection ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:DOPRotection?</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:ALPHA &lt;value&gt;</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:ALPHA?</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:BBT &lt;value&gt;</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:BBT?</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:CHANnel?</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer:CHANnel?</td>
<td>N/A</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:FILTer:TYPE</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>RNYQuist</td>
<td>NYQuist</td>
<td>GAUSsian</td>
<td>RECTangle</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:FILTer:TYPE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio[1]:ARB:FILTer[:STATe]ON</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:GENerate:SINE</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>&quot;&lt;file_name&gt;&quot;,&lt;osr&gt;,[&lt;scale&gt;],[I</td>
<td>Q</td>
<td>IQ]&lt;phasedeg&gt;</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:GENerate:TEST:WAVef orms</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADer:CLEar</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADER:NOISe:RMS:OVERride &quot;&lt;file_name&gt;&quot;,&lt;value&gt;</td>
<td>UNSPecified</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADER:NOISe:RMS:OVERride? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADER:RMS &quot;&lt;file_name&gt;&quot;,&lt;value&gt;</td>
<td>UNSPecified</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADER:RMS? &quot;&lt;file_name&gt;&quot;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:HEADer:SAVE</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:IQ:MODulation:ATTen &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:IQ:MODulation:ATTen?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
Table G.4.2-1  Dual ARB Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:ARB:IQ:MODulation:ATTen:AUTO:ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MARKer:CLEar &quot;&lt;file_name&gt;&quot;&quot;,&quot;&lt;marker&gt;&quot;&quot;,&quot;&lt;first_point&gt;&quot;&quot;,&quot;&lt;last_point&gt;&quot;</td>
<td></td>
<td></td>
<td>N/A Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MARKer:CLEar:ALL &quot;&lt;file_name&gt;&quot;&quot;,&quot;&lt;marker&gt;&quot;</td>
<td></td>
<td></td>
<td>N/A Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MARKer:ROTate &quot;&lt;file_name&gt;&quot;&quot;,&quot;&lt;rotate_count&gt;&quot;</td>
<td></td>
<td></td>
<td>N/A Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MARKer:[SET] &quot;&lt;file_name&gt;&quot;&quot;,&quot;&lt;marker&gt;&quot;&quot;,&quot;&lt;first_point&gt;&quot;&quot;,&quot;&lt;last_point&gt;&quot;&quot;,&quot;&lt;skip_count&gt;&quot;</td>
<td></td>
<td></td>
<td>N/A Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync OFF</td>
<td>MASTer</td>
<td>SLAVe</td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync?</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync:NSLaves &lt;value&gt;</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync:SLISten</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync:SREFerence &lt;value&gt;</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MBSync:SSLaves</td>
<td></td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>
### Table G.4.2-1  Dual ARB Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:ARB:MDEStination:ALCHold NONE</td>
<td>M1</td>
<td>M2</td>
<td>M3</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MDEStination:ALCHold?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MDEStination:PULSe NONE</td>
<td>M1</td>
<td>M2</td>
<td>M3</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MDEStination:PULSe?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MPOLarity:MARKer1</td>
<td>2</td>
<td>3 NEGative</td>
<td>POSitive</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:MPOLarity:MARKer1</td>
<td>2</td>
<td>3</td>
<td>4?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:BANDwidth &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:NOISe:BANDwidth &lt;freq&gt;</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:BANDwidth?</td>
<td>√</td>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:NOISe:BANDwidth?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CBRate &lt;1bps - 999Mbps&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CBRate?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CBWidth &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CBWidth?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CN &lt;value&gt;&lt;unit&gt;</td>
<td>√</td>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:NOISe:CN &lt;rel_ampl&gt;</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CN?</td>
<td>√</td>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:NOISe:CN?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:NOISe:CNFormat CN</td>
<td>EBNO</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
</tbody>
</table>
### Table G.4.2-1 Dual ARB Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe:CNFormat?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe:EBNO &lt;ebno in dB&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe:EBNO?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD[1]:ARB:NOISe:MUX SUM</td>
<td>CARRier</td>
<td>NOISe</td>
<td>N/A</td>
</tr>
<tr>
<td>[:SOURce]:RAD[1]:ARB:NOISe:MUX?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe:POWer:NOISe:TOTal &lt;totalNoisePowerInDbm&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe:POWer:NOISe:TOTal?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:NOISe[:STATe]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:RAD:ARB:NOISe[:STATe]?</td>
</tr>
<tr>
<td>[:SOURce]:RAD:ARB:PHASe:NOISe:F1 &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe:F1?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe:F2 &lt;value&gt;&lt;unit&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe:F2?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe:LMID &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe:LMID?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:PHAse:NOISe[:STATe]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:REGister[:STATus]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB:REGister[:STATus]?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:RETRigger ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:RSCaling &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:RSCaling?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:SCALing &quot;&lt;file_name&gt;&quot;,&lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:SCLock:RATE &lt;value&gt;</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
## Table G.4.2-1  Dual ARB Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:ARB:SEQ</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>uence[:MWAVeform]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;filename&gt;,&lt;waveform1&gt;,&lt;reps&gt;,NONE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>M2</td>
<td>M3</td>
<td>M4</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:SEQ</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>uence[:MWAVeform]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;filename&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRI</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>SINGle</td>
<td>set to Off.</td>
<td>CONTinuous:</td>
</tr>
<tr>
<td>CONTinuous</td>
<td>SINGle</td>
<td>MG3710A/MG3740A is</td>
<td>MG3710A/MG3740A is</td>
</tr>
<tr>
<td>CONTinuous</td>
<td>SINGle</td>
<td>set to On.</td>
<td>set to Off.</td>
</tr>
<tr>
<td>CONTinuous</td>
<td>SINGle</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>CONTinuous</td>
<td>SINGle</td>
<td>be used.</td>
<td>be used.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRI</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>?:CONTinuous</td>
<td>set to Off.</td>
<td>CONTinuous:</td>
</tr>
<tr>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:TRI</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>?:CONTinuous</td>
<td>be used.</td>
<td>set to On.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRI</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>?:</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>[:SOURce][1]</td>
<td>2]:RADio:ARB:TRI</td>
<td>be used.</td>
<td>set to On.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRI</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>CONTin</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>uous[:TYPE]</td>
<td>FREE</td>
<td>be used.</td>
<td>set to On.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>CONTin</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>uous[:TYPE]</td>
<td>FREE</td>
<td>be used.</td>
<td>set to On.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRI</td>
<td>CONTinuous</td>
<td>MG3710A/MG3740A is</td>
<td></td>
</tr>
<tr>
<td>Gger:TYPE</td>
<td>CONTin</td>
<td>GATE</td>
<td>SADVance cannot</td>
</tr>
<tr>
<td>uous[:TYPE]</td>
<td>LOW</td>
<td>be used.</td>
<td>set to On.</td>
</tr>
<tr>
<td>N5162A/N5182A Commands</td>
<td>Compatibility</td>
<td>MG3710A/MG3740A Commands (SCPI mode)</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------</td>
<td>--------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger:TYPE:GATE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE] SINGLE</td>
<td>CONTinuous</td>
<td>N/A</td>
<td>Not supported.</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce] KEY</td>
<td>EXT</td>
<td>BUS</td>
<td>√</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB:TRIGger:SOURc e?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL:DELAY &lt;value&gt;</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB:TRIGger[:SOUR ce]:EXTERNAL:DELAY &lt;time&gt;</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL:STATE ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL:STATE?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL:SLOPe POSitive</td>
<td>NEGative</td>
<td>√</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL:SLOPe?</td>
<td>√</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB:TRIGger[:SOUR ce]:EXTERNAL:SLOPe?</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL[:SOURce] EPT1</td>
<td>EPT2</td>
<td>EPTRIGGER1</td>
<td>EPTRIGGER2</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB:TRIGger[:SOURce]:EXTERNAL[:SOURce]?</td>
<td>N/A</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>

The argument is `<time>` in the MG3710A/MG3740A Commands (SCPI mode).
### Table G.4.2-1  Dual ARB Subsystem Device Messages (Cont’d)

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:ARB:WAVeform</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB:WAVeform &lt;string&gt;</td>
</tr>
<tr>
<td>&quot;WFM1:file_name&quot;</td>
<td>&quot;SEQ:filename&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;WFM1:file_name&quot;</td>
<td>&quot;SEQ:filename&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:ARB[:STATe]?</td>
<td>✓</td>
<td>[:SOURce[1]</td>
<td>2]:RADio:ARB[:STATe]?</td>
</tr>
</tbody>
</table>
### G.4.3 LARB Subsystem

LARB subsystem device messages available in MG3710A/MG3740A are shown in Table G.4.3-1.

<table>
<thead>
<tr>
<th>N5162A/N5182A Commands</th>
<th>Compatibility</th>
<th>MG3710A/MG3740A Commands (SCPI mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:SOURce]:RADio:LARB[:STATe] ON</td>
<td>OFF</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>[:SOURce]:RADio:LARB[:STATe]?</td>
<td>✓</td>
<td>[:SOURce]:RADio:LARB[:STATe]?</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix H  Panel Keys and Keyboard Operations

**Table H-1  Correspondences Between Panel Keys and Keyboard Operations**

<table>
<thead>
<tr>
<th>Panel Key</th>
<th>USB Keyboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preset</td>
<td>Ctrl+Shift+R</td>
</tr>
<tr>
<td>Local</td>
<td>Ctrl+Shift+O</td>
</tr>
<tr>
<td>Cal</td>
<td>Ctrl+Shift+9</td>
</tr>
<tr>
<td>Save</td>
<td>Ctrl+S</td>
</tr>
<tr>
<td>Recall</td>
<td>Ctrl+O</td>
</tr>
<tr>
<td>Copy</td>
<td>Ctrl+Shift+8</td>
</tr>
<tr>
<td>Top</td>
<td>Ctrl+Shift+↑</td>
</tr>
<tr>
<td>F1</td>
<td>F1</td>
</tr>
<tr>
<td>F2</td>
<td>F2</td>
</tr>
<tr>
<td>F3</td>
<td>F3</td>
</tr>
<tr>
<td>F4</td>
<td>F4</td>
</tr>
<tr>
<td>F5</td>
<td>F5</td>
</tr>
<tr>
<td>F6</td>
<td>F6</td>
</tr>
<tr>
<td>F7</td>
<td>F7</td>
</tr>
<tr>
<td>F8</td>
<td>F8</td>
</tr>
<tr>
<td>More</td>
<td>Ctrl+Shift+→</td>
</tr>
<tr>
<td>Back</td>
<td>Ctrl+Shift←</td>
</tr>
<tr>
<td>SG1</td>
<td>Ctrl+Shift+U</td>
</tr>
<tr>
<td>SG2</td>
<td>Ctrl+Shift+I</td>
</tr>
<tr>
<td>IQpro</td>
<td>Ctrl+Shift+P</td>
</tr>
<tr>
<td>Frequency</td>
<td>Ctrl+Shift+Y</td>
</tr>
<tr>
<td>Sweep/List</td>
<td>Ctrl+Shift+6</td>
</tr>
<tr>
<td>AM</td>
<td>Ctrl+Shift+1</td>
</tr>
<tr>
<td>I/Q</td>
<td>Ctrl+Alt+X</td>
</tr>
<tr>
<td>Level</td>
<td>Ctrl+Shift+L</td>
</tr>
<tr>
<td>Mode</td>
<td>Ctrl+Alt+V</td>
</tr>
<tr>
<td>FM/φM</td>
<td>Ctrl+Shift+5</td>
</tr>
<tr>
<td>AUX Fctn</td>
<td>Ctrl+Shift+3</td>
</tr>
<tr>
<td>Load</td>
<td>Ctrl+Shift+F1</td>
</tr>
<tr>
<td>Select</td>
<td>Ctrl+Shift+F2</td>
</tr>
<tr>
<td>Pulse</td>
<td>Ctrl+Shift+4</td>
</tr>
<tr>
<td>Utility</td>
<td>Ctrl+Alt+B</td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Panel Key</th>
<th>USB Keyboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Tab</td>
<td>Tab</td>
</tr>
<tr>
<td>Shift</td>
<td>Shift</td>
</tr>
<tr>
<td>BS</td>
<td>Back Space</td>
</tr>
<tr>
<td>Ctrl</td>
<td>Ctrl</td>
</tr>
<tr>
<td>Alt</td>
<td>Alt</td>
</tr>
<tr>
<td>Alt+Tab</td>
<td>Alt+Tab</td>
</tr>
<tr>
<td>Cancel</td>
<td>Esc</td>
</tr>
<tr>
<td>Help</td>
<td>Ctrl+Shift+H</td>
</tr>
<tr>
<td>Enter</td>
<td>Enter</td>
</tr>
<tr>
<td>Ctrl+Shift+7</td>
<td>Ctrl+Shift+7</td>
</tr>
<tr>
<td>Windows</td>
<td>Windows</td>
</tr>
</tbody>
</table>

**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)

<table>
<thead>
<tr>
<th>Panel Key</th>
<th>USB Keyboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>→</td>
<td>→</td>
</tr>
<tr>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>←</td>
<td>←</td>
</tr>
<tr>
<td></td>
<td>Rotary knob, clockwise</td>
</tr>
<tr>
<td></td>
<td>Mouse wheel up</td>
</tr>
<tr>
<td></td>
<td>Rotary knob, counter-clockwise</td>
</tr>
<tr>
<td></td>
<td>Mouse wheel down</td>
</tr>
<tr>
<td>RF Output Mod On/Off</td>
<td>Ctrl+Shift+Q</td>
</tr>
<tr>
<td>RF Output On/Off</td>
<td>Ctrl+Shift+G</td>
</tr>
<tr>
<td>2nd RF Output Mod On/Off</td>
<td>Ctrl+Shift+E</td>
</tr>
<tr>
<td>2nd RF Output On/Off</td>
<td>Ctrl+Shift+S</td>
</tr>
</tbody>
</table>

**Note:**

The figure in Ctrl+Shift+“figure” cannot be entered by the numeric keypad.
Appendix I  Scanning for Virus

For the MG3710A/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/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/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:

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.1</td>
<td>For Windows Embedded Standard 2009</td>
</tr>
<tr>
<td>I.1.1</td>
<td>Connecting external PC to MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.1.2</td>
<td>Checking IP address of MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.1.3</td>
<td>Configuring shared settings</td>
</tr>
<tr>
<td>I.1.4</td>
<td>Changing user account for MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.1.5</td>
<td>Shared settings for MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.1.6</td>
<td>Mounting MG3710A/MG3740A drives to external PC drives</td>
</tr>
<tr>
<td>I.1.7</td>
<td>Scanning for virus</td>
</tr>
<tr>
<td>I.1.8</td>
<td>Dismounting MG3710A/MG3740A drives from external PC drives</td>
</tr>
<tr>
<td>I.1.9</td>
<td>Making MG3710A/MG3740A drives unshared</td>
</tr>
<tr>
<td>I.1.10</td>
<td>Restoring previous user account setting for MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.1.11</td>
<td>Enabling Simple File Sharing</td>
</tr>
<tr>
<td>I.2</td>
<td>For Windows 7 Professional or Windows Embedded Standard 7</td>
</tr>
<tr>
<td>I.2.1</td>
<td>Connecting external PC to MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.2.2</td>
<td>Checking IP address of MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.2.3</td>
<td>Configuring shared settings</td>
</tr>
<tr>
<td>I.2.4</td>
<td>Changing user account for MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.2.5</td>
<td>Shared settings for MG3710A/MG3740A</td>
</tr>
<tr>
<td>I.2.6</td>
<td>Mounting MG3710A/MG3740A drives to external PC drives</td>
</tr>
<tr>
<td>I.2.7</td>
<td>Scanning for virus</td>
</tr>
</tbody>
</table>
I.2.8  Dismounting MG3710A/MG3740A drives from external PC drives ........................................... I-25
I.2.9  Making MG3710A/MG3740A drives unshared I-25
I.2.10 Restoring previous user account setting for MG3710A/MG3740A ....................................... I-25
I.2.11 Enabling Sharing Settings ............................... I-26

Notes:

● 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/MG3740A might become unusable.

If the MG3710A/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/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.
Appendix I  Scanning for Virus

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-specific DNS Suffix .
            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.
4. Click **OK**.

![Folder Options](image.png)
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.
4. In the Computer Management tree, select Users under Local Users and Groups.

5. Right-click the user account “ANRITSU” to use, and select the Set Password... menu.

6. When the message below is shown during the password setting, select Proceed.
7. Type “ANRITSU” for the password.

![Password dialog]

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.
4. Select the Sharing tab.
5. To disable the default sharing setting, select Do not share this folder.
6. Click the Apply button.
Appendix I  Scanning for Virus

7. A dialog appears. Select Yes.

8. Select Share this folder.

9. Click the Permissions button.

10. Select the Allow check box for Full control.

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 \192.168.0.1\c for Folder.

To mount the D drive, specify Z for Drive and \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).
Appendix I  Scanning for Virus

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.
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 password has been changed in Section I.1.4 “Changing the user account for the MG3710A/MG3740A” for mounting the MG3710A/MG3740A drives to network drives of the external computer. 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:

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 selected.
4. Click OK.
I.2 For Windows 7 Professional or Windows Embedded Standard 7

I.2.1 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.2.2 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.
I.2 For Windows 7 Professional or Windows Embedded Standard 7
I.2.3 Configuring shared settings

Sharing Settings is enabled for the MG3710A/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/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 off network discovery**, **Turn off file and printer sharing**, and **Turn on Password protected sharing**.

5. Click **Save changes**.
I.2.4 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. 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

4. From the Administrative Tools menu, select Computer Management.

5. In the Computer Management tree, select Users under Local Users and Groups.

6. Right-click the user account “ANRITSU” to use, and select the Set Password... menu.
Appendix I  Scanning for Virus

7. When the message below is shown, select Proceed.

8. Type “ANRITSU” for the password.

9. After setting the password, click OK in the dialog for confirmation.
I.2.5 Shared settings for MG3710A/MG3740A

1. From the Start menu, select Computer.
2. Right-click the C drive and select Properties.
3. Select the Sharing tab and click the Advanced Sharing... button.
Appendix I  Scanning for Virus

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**.

6. Click **OK** to close two dialogs displayed.
7. Repeat steps 2 to 7 to the D drive.
I.2.6 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, click Start and then click Computer.

3. From the Computer menu, select Map Network Drive.

4. 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 \192.168.0.1\c for Folder.
   
   To mount the D drive, specify Z for Drive and \192.168.0.1\d for Folder.

5. Select the Connect using different credentials (C) check box.
6. Enter ANRITSU for the User name, and also ANRITSU for the Password (as specified in Section I.2.4, Step 7).

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/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/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/MG3740A

The user password has been changed in Section I.2.4 “Changing the user account for the MG3710A/MG3740A” for mounting the MG3710A/MG3740A drives to network drives of the external computer. 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/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.
Appendix J  MG3641A/42A Compatible Command

This appendix describes SCPI commands for signal generators supported by the MG3710A/MG3740A.

Supported signal generators

Anritsu        MG3641A/MG3642A

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     J.1.2  Output Setting..................................... J-4
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## J.1 Basic Function Commands

### J.1.1 Frequency Setting

Frequency setting device messages available in MG3710A/MG3740A are shown in Table J.1.1-1.

**Table J.1.1-1  Frequency Setting Device Messages**

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:FREQuency[:CW] &lt;freq&gt;</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency[:CW]:FIXed &lt;freq&gt;</td>
</tr>
<tr>
<td>:FREQuency[:CW]?</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency[:CW]:FIXed?</td>
</tr>
<tr>
<td>:FREQuency[:CW]:STEP[:INCReiment] &lt;freq&gt;</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:STEP[:INCReiment] &lt;freq&gt;</td>
</tr>
<tr>
<td>:FREQuency[:CW]:STEP[:INCReiment]?</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:STEP[:INCReiment]?</td>
</tr>
<tr>
<td>:FREQuency:RELative &lt;boolean&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:RELative?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:OFFSet</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:OFFSet &lt;freq&gt;</td>
</tr>
<tr>
<td>:FREQuency:OFFSet?</td>
<td>[:SOURce[1]</td>
<td>2]:FREQuency:OFFSet?</td>
</tr>
<tr>
<td>:FREQuency:SWEep RUN</td>
<td>STOP</td>
<td>PAUSE</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STARt &lt;freq&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STARt?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>MG3641A/MG3642A Commands</td>
<td>MG3710A/MG3740A Commands (MG364xA mode)</td>
<td>MG3710A/MG3740A Commands (SCPI mode) / Remarks</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STOP &lt;freq&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STOP?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:CENTer &lt;freq&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:CENTer?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:SPAN &lt;freq&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:SPAN?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STEP:SIZE</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:FREQuency:SWEep:STEP:NUMBer</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:STEP:NUMBer?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:FREQuency:SWEep:MODE AUTO</td>
<td>SINGLE</td>
<td>MANUAL</td>
</tr>
<tr>
<td>:FREQuency:SWEep:MODE?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce]:LIST:MODE? Refer to the same parameter in frequency and level.</td>
</tr>
<tr>
<td>:FREQuency:SWEep:TIME</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
</tbody>
</table>
### Output Setting

Output setting device messages available in MG3710A/MG3740A are shown in Table J.1.2-1.

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:FREQuency:SWEep:TIME?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce{1}</td>
</tr>
<tr>
<td>:FREQuency:SWEep:MARKer</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:FREQuency:SWEep:PATTern SIZE</td>
<td>NO</td>
<td>LOG</td>
</tr>
<tr>
<td>:FREQuency:SWEep:TYPE 0</td>
<td>1</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:LEVel</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:LEVel?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:LEVel:STEP[:INCRement]</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:LEVel:STEP[:INCRement]?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:UNIT</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:UNIT?</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### Table J.1.2-1 Output Setting Device Messages (Cont'd)

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:AMPLitude[:OUT]:STATe &lt;boolean&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:OUTPut[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:STATe?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:OUTPut[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:CONTinuous</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:CONTinuous?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SAFety</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SAFety?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:VOLT EMF</td>
<td>TERM</td>
<td>MG3641A/MG3642A Commands can be used.</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:VOLT?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:UNIT[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:RELative &lt;boolean&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:RELative?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:OFFSet &lt;rel_ampl&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:OFFSet?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:ISOLation &lt;boolean&gt;</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:ISOLation?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:RPPReset</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:OUTPut:PROTection:RESume</td>
</tr>
</tbody>
</table>
### J.1.3 Sweep Function

Sweep function device messages available in MG3710A/MG3740A are shown in Table J.1.3-1.

**Table J.1.3-1  Sweep Function Device Messages**

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:AMPLitude[:OUT]:SWEep RUN</td>
<td>STOP</td>
<td>PAUSE</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STARt</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STARt?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STOP</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STOP?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:CENTer</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:CENTer?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:SPAN</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:SPAN?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STEP:SIZE</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### MG3641A/MG3642A Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STEP:NUMBER</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:STEP:NUMBER?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:MODE AUTO</td>
<td>SINGLE</td>
<td>MANUAL</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:MODE?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce]:LIST:MODE? Refer to the same parameter in frequency and level.</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:TIME</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:TIME?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>[:SOURce[1]</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:MARKer &lt;rel_ampl&gt;</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:MARKer?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:PATTern SIZE</td>
<td>NO</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:PATTern?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:TYPE 0</td>
<td>1</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:AMPLitude[:OUT]:SWEep:TYPE?</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
## J.1.4 Amplitude Modulation

Amplitude modulation device messages available in MG3710A/MG3740A are shown in Table J.1.4-1.

### Table J.1.4-1 Amplitude Modulation Device Messages

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:AM[:DEPTH] &lt;percent&gt;</td>
<td>[:SOURce[1]</td>
<td>2]:AM[1]</td>
</tr>
<tr>
<td>:AM[:DEPTH]?</td>
<td>[:SOURce[1]</td>
<td>2]:AM[1]</td>
</tr>
<tr>
<td>:AM:STATe &lt;boolean&gt;</td>
<td>[:SOURce[1]</td>
<td>2]:AM[1]</td>
</tr>
<tr>
<td>:AM:SOURce INT1</td>
<td>INT2</td>
<td>INT3</td>
</tr>
<tr>
<td>:AM:SOURce?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
</tbody>
</table>
### J.1.5 Frequency Modulation

Frequency modulation device messages available in MG3710A/MG3740A are shown in Table J.1.5-1.

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>[:FM[:FM1][[:DEViation] &lt;freq&gt;</td>
<td>[:SOURce[1]</td>
<td>2]:FM[1]</td>
</tr>
<tr>
<td>[:FM[:FM1][[:DEViation]?</td>
<td>[:SOURce[1]</td>
<td>2]:FM[1]</td>
</tr>
<tr>
<td>[:FM[:FM1]:STATe</td>
<td>[:SOURce[1]</td>
<td>2]:FM[1]</td>
</tr>
<tr>
<td>[:FM[:FM1]:STATe?</td>
<td>[:SOURce[1]</td>
<td>2]:FM[1]</td>
</tr>
<tr>
<td>[:FM[:FM1]:SOURce INT1</td>
<td>INT2</td>
<td>INT3</td>
</tr>
<tr>
<td>[:FM[:FM1]:SOURce?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>[:FM[:FM2][[:DEViation] &lt;freq&gt;</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:FM[:FM2][[:DEViation]?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:FM[:FM2]:STATe</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:FM[:FM2]:STATe?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>[:FM[:FM2]:SOURce INT1</td>
<td>INT2</td>
<td>INT3</td>
</tr>
<tr>
<td>[:FM[:FM2]:SOURce?</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
J.1.6 Phase Modulation

Phase modulation device messages available in MG3710A/MG3740A are shown in Table J.1.6-1.

Table J.1.6-1 Phase Modulation Device Messages

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:PM:IMPedance HIGH</td>
<td>LOW</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:PM:IMPedance?</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
## J.1.7 Modulation Signal Source

Modulation signal source device messages available in MG3710A/MG3740A are shown in Table J.1.7-1.

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>::LFSource:FREQuency 0</td>
<td>1</td>
<td>400HZ</td>
</tr>
<tr>
<td>::LFSource:FREQuency2 &lt;freq&gt;</td>
<td>::SOURce[1]</td>
<td>2]:LFSource:FREQuency2 &lt;freq&gt;</td>
</tr>
<tr>
<td>::LFSource:WAVEform2 SIN</td>
<td>TRI</td>
<td>SAW</td>
</tr>
<tr>
<td>::LFSource:FREQuency3 &lt;freq&gt;</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>::LFSource:FREQuency3?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>::LFSource:WAVEform3 SIN</td>
<td>TRI</td>
<td>SAW</td>
</tr>
<tr>
<td>::LFSource:WAVEform3?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>::LFSource:EXTernal:COUPling AC</td>
<td>DC</td>
<td>::SOURce[1]</td>
</tr>
<tr>
<td>MG3641A/MG3642A Commands</td>
<td>MG3710A/MG3740A Commands (MG364xA mode)</td>
<td>MG3710A/MG3740A Commands (SCPI mode) / Remarks</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>:LFSource:EXTernal2:COUPling AC</td>
<td>DC</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:LFSource:OUTPut:LEVel</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:LFSource:OUTPut:SOURce</td>
<td>INT1</td>
<td>INT2</td>
</tr>
</tbody>
</table>
J.1.8 Memory Setting

Memory Setting device messages available in MG3710A/MG3740A are shown in Table J.1.8-1.

<table>
<thead>
<tr>
<th>MG3641A/MG3642A Commands</th>
<th>MG3710A/MG3740A Commands (MG364xA mode)</th>
<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:MEMory:RECall &lt;ext_numeric&gt;</td>
<td>Not supported.</td>
<td>:MMEMory:LOAD:STATe &lt;string&gt;[,&lt;device&gt;]</td>
</tr>
<tr>
<td>:MEMory:RECall:TYPE 0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>:MEMory:STORE &lt;numeric&gt;</td>
<td>Not supported.</td>
<td>:MMEMory:DELETE:STATe &lt;filename&gt;,&lt;device&gt;</td>
</tr>
<tr>
<td>:MEMory:SKIP</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:CLEAR</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:SWEep RUN</td>
<td>STOP</td>
<td>PAUSE</td>
</tr>
<tr>
<td>:MEMory:SWEep:SATRt</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:SWEep:STOP</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:SWEep:MODE AUTO</td>
<td>SINGLE</td>
<td>MANUAL</td>
</tr>
<tr>
<td>:MEMory:SWEep:TIME</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:MEMory:SWEep:MARKer</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
### J.2 System Commands

#### J.2.1 Display Subsystem

Display subsystem device messages available in MG3710A/MG3740A are shown in Table J.2.1-1.

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<tr>
<th>MG3641A/MG3642A Commands</th>
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<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:DISPlay:STATe 0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>:DISPlay:MENU</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>:SYStem:BELL &lt;boolean&gt;</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:SYStem:BEEPer ON</td>
</tr>
<tr>
<td>:SYStem:BELL?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:SYStem:BEEPer?</td>
</tr>
<tr>
<td>:SYStem:ALARm</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:SYStem:BEEPer ON</td>
</tr>
<tr>
<td>:SYStem:ALARm?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:SYStem:BEEPer?</td>
</tr>
<tr>
<td>:SYStem:MEMory SET</td>
<td>CLEAR</td>
<td>Not supported.</td>
</tr>
<tr>
<td>:SYStem:ERRor?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td>:SYStem:ERror:CODe[:NEXT]?</td>
</tr>
<tr>
<td>:SYStem:TRIGger?</td>
<td>Not supported.</td>
<td></td>
</tr>
</tbody>
</table>
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SCPI device messages available in MG3710A/MG3740A are shown in Table J.2.2-1.

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<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>:STATus:QUESTionable [:EVENt]?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:CONDition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:ENABLE</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:ENABLE?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:PTRansition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:QUESTionable:NTRansition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation [:EVENt]?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation:CONDition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation:ENABLE</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation:ENABLE?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation:PTRansition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
<tr>
<td>:STATus:OPERation:NTRansition?</td>
<td>MG3641A/MG3642A Commands can be used.</td>
<td></td>
</tr>
</tbody>
</table>
### IEEE 488.2 Common Commands

IEEE 488.2 Common Commands device messages available in MG3710A/MG3740A are shown in Table J.2.3-1.

#### Table J.2.3-1  IEEE 488.2 Common Commands Device Messages

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<th>MG3710A/MG3740A Commands (SCPI mode) / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>*IDN?</td>
<td>*IDN?</td>
<td></td>
</tr>
<tr>
<td>*OPC</td>
<td>*OPC</td>
<td></td>
</tr>
<tr>
<td>*OPC?</td>
<td>*OPC?</td>
<td></td>
</tr>
<tr>
<td>*TST?</td>
<td>*TST?</td>
<td></td>
</tr>
<tr>
<td>*WAI</td>
<td>*WAI</td>
<td></td>
</tr>
<tr>
<td>*CLS</td>
<td>*CLS</td>
<td></td>
</tr>
<tr>
<td>*ESE</td>
<td>*ESE</td>
<td></td>
</tr>
<tr>
<td>*ESE?</td>
<td>*ESE?</td>
<td></td>
</tr>
<tr>
<td>*ESR?</td>
<td>*ESR?</td>
<td></td>
</tr>
<tr>
<td>*SRE</td>
<td>*SRE</td>
<td></td>
</tr>
<tr>
<td>*SRE?</td>
<td>*SRE?</td>
<td></td>
</tr>
<tr>
<td>*STB?</td>
<td>*STB?</td>
<td></td>
</tr>
<tr>
<td>MG3641A/MG3642A Commands</td>
<td>MG3710A/MG3740A Commands (MG364xA mode)</td>
<td>MG3710A/MG3740A Commands (SCPI mode) / Remarks</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>*PCS</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*PCS?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*SAV</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*RCL</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*OPT?</td>
<td>Not supported.</td>
<td></td>
</tr>
<tr>
<td>*RST</td>
<td>*RST</td>
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<tr>
<td>φM</td>
<td>7-43</td>
</tr>
<tr>
<td>φM Deviation</td>
<td>7-44</td>
</tr>
<tr>
<td>φM Source</td>
<td>7-48</td>
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## A

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<tbody>
<tr>
<td>A/B Ratio</td>
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</tr>
<tr>
<td>A/B Signal Setting</td>
<td>7-97</td>
</tr>
<tr>
<td>AC inlet</td>
<td>3-10</td>
</tr>
<tr>
<td>Active function frame</td>
<td>3-23</td>
</tr>
<tr>
<td>Additional Analog Modulation Input SG1 connector</td>
<td>3-10</td>
</tr>
<tr>
<td>Additional Analog Modulation Input SG2 connector</td>
<td>3-10</td>
</tr>
<tr>
<td>Alarm History</td>
<td>9-20</td>
</tr>
<tr>
<td>Saving</td>
<td>9-21</td>
</tr>
<tr>
<td>ALC</td>
<td>3-18</td>
</tr>
<tr>
<td>Alt key</td>
<td>3-4</td>
</tr>
<tr>
<td>Alt-Tab key</td>
<td>3-4</td>
</tr>
<tr>
<td>AM</td>
<td>7-14, 7-16</td>
</tr>
<tr>
<td>AM Depth (Lin)</td>
<td>7-17</td>
</tr>
<tr>
<td>AM Depth (Log)</td>
<td>7-19</td>
</tr>
<tr>
<td>AM Depth Type</td>
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<tr>
<td>AM modulation</td>
<td>7-14</td>
</tr>
<tr>
<td>AM Modulation On/Off</td>
<td>7-16</td>
</tr>
<tr>
<td>AM Rate</td>
<td>7-20</td>
</tr>
<tr>
<td>AM Source</td>
<td>7-22</td>
</tr>
<tr>
<td>Analog I/Q Input Adjustments</td>
<td>7-248</td>
</tr>
<tr>
<td>Analog I/Q Output Adjustments</td>
<td>7-251</td>
</tr>
<tr>
<td>Analog Modulation</td>
<td>7-12</td>
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<tr>
<td>Analog/Pulse</td>
<td>7-12</td>
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<tr>
<td>Applicable parts</td>
<td>1-8</td>
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<tr>
<td>Application software</td>
<td>1-10</td>
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<td>ARB</td>
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<tr>
<td>ARB On/Off</td>
<td>7-77</td>
</tr>
<tr>
<td>ARB Setup</td>
<td>7-77</td>
</tr>
<tr>
<td>Arrow keys</td>
<td>3-4</td>
</tr>
<tr>
<td>at SyncLoss</td>
<td>8-31</td>
</tr>
<tr>
<td>ATT Hold</td>
<td>5-25</td>
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## B

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<td>Back key</td>
<td>3-3</td>
</tr>
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<td>Back-up battery</td>
<td>vi</td>
</tr>
<tr>
<td>Baseband Clock</td>
<td>7-161</td>
</tr>
<tr>
<td>Baseband Mode</td>
<td>7-71</td>
</tr>
<tr>
<td>Baseband Reference Clock Input connector</td>
<td>3-7</td>
</tr>
<tr>
<td>Baseband Reference Clock Output connector</td>
<td>3-7</td>
</tr>
<tr>
<td>BBDAC</td>
<td>3-18</td>
</tr>
<tr>
<td>Beep Sound</td>
<td>9-29</td>
</tr>
<tr>
<td>BER Count</td>
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<tr>
<td>Clear</td>
<td>8-16</td>
</tr>
<tr>
<td>BER dialog box</td>
<td>8-6</td>
</tr>
<tr>
<td>BER function menu</td>
<td>8-12</td>
</tr>
<tr>
<td>BER Interface</td>
<td>8-32</td>
</tr>
<tr>
<td>BER Log</td>
<td>8-54</td>
</tr>
<tr>
<td>BER Test Log</td>
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</tr>
<tr>
<td>Board Info</td>
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</tr>
<tr>
<td>BS key</td>
<td>3-4</td>
</tr>
<tr>
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<td>3-8</td>
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<td>Buffered Trigger</td>
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</table>

## C

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<tr>
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<td>3-2</td>
</tr>
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<td>Cal Type</td>
<td>7-245</td>
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<td>Calibration</td>
<td>11-6</td>
</tr>
<tr>
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<td>3-4</td>
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<td>Carrier Level</td>
<td>7-231</td>
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<td>Center Signal</td>
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