Product Introduction

MX370110A/MX269910A

LTE TDD IQproducer

MG3710A
Vector Signal Generator

MS2690A/MS2691A/MS2692A/MS2830A
Signal Analyzer

MG3710A Vector Signal Generator

MS269xA-020, MS2830A-020/021 Vector Signal Generator option
for MS269xA/MS2830A Signal Analyzer

MX370110A/MX269910A LTE TDD IQproducer

NEW **MX370110A-001/MX269910A-001 LTE-Advanced TDD Option**

* MX370110A-001 supports MG3700A Vector Signal Generator

Product Introduction

MG3710A
Vector Signal Generator

MS269xA
Signal Analyzer

MS2830A
Signal Analyzer

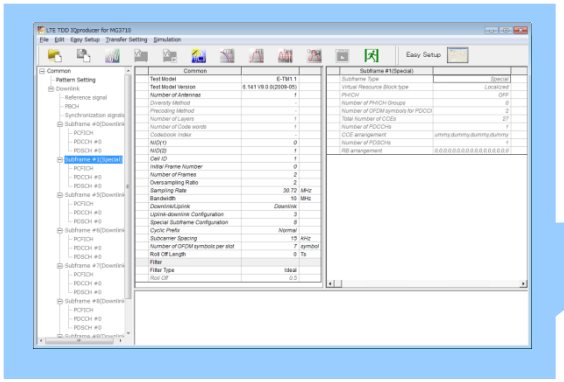
Version 2.00

ANRITSU CORPORATION

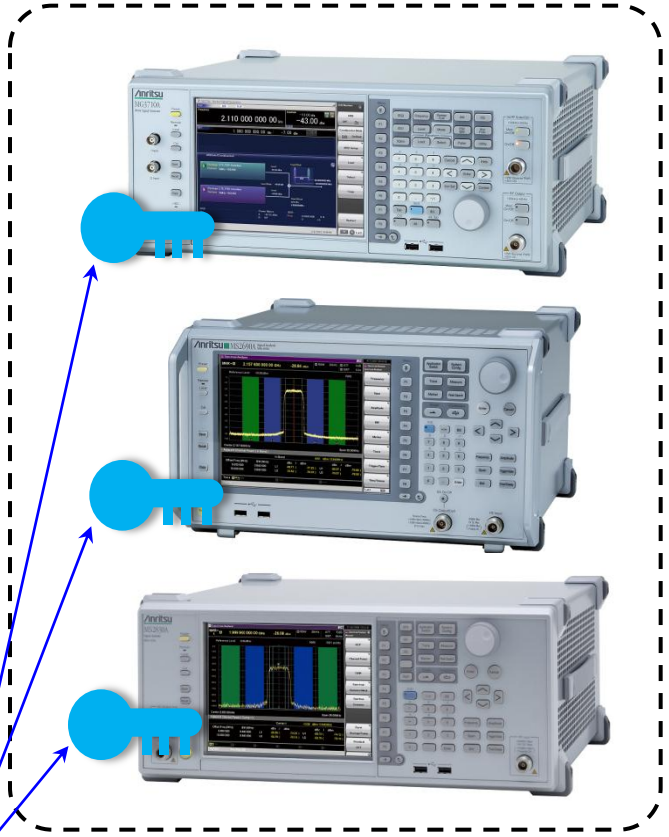
What is LTE TDD IQproducer?

The LTE TDD IQproducer is PC software for generating waveform patterns in compliance with the 3GPP LTE TDD specifications in the 3GPP TS36.211, TS36.212 and TS36.213 standards.
The MX370108A-001 LTE-Advanced TDD option supports simple generation of carrier aggregation signals added by 3GPP Rel. 10. Additionally, clustered SC-FDMA signals can be generated at Uplink.
The software runs under the Windows OS installed in the MG3710A, MS2690A/91A/92A-020, and MS2830A-020/021.
It outputs modulation signals by selecting generated waveform patterns.

LTE TDD IQproducer



Install



- Generating waveform patterns using LTE TDD IQproducer => The main frame requires a license.
The unlicensed software will run on the PC to test waveform pattern generation but an unlicensed SG cannot output signals because it does not recognize the waveform patterns.

- Generating waveform patterns using EDA Tools (C, MATLAB, Microwave Office) => Free license

What is LTE TDD IQproducer?

NEW

MX370110A-001 LTE-Advanced TDD Option: for MG3710A
MX269910A-001 LTE-Advanced TDD Option: for MS269xA-020, MS2830A-020/021

The MX370108A-001 LTE-Advanced TDD option supports simple generation of carrier aggregation signals added by 3GPP Rel. 10.
Additionally, clustered SC-FDMA signals can be generated at Uplink.

Example of Vector Signal Generator series LTE-Advanced Carrier Aggregation Function

Vector Signal Generator Series / Carrier Aggregation Mode	Vector Signal Generator		Vector Signal Generator Option for Signal Analyzer	
	MG3710A*1	MG3700A*1	MS2690A series Opt. 020*2	MS2830A Opt. 020/021*2
Intra-band contiguous Carrier Aggregation, Intra-band non-contiguous Carrier Aggregation	✓ (1 unit)	✓ (1 unit)	✓ (1 unit)	✓ (1 unit)
Inter-band non-contiguous Carrier Aggregation	✓ (2 RF 1 unit*3, or 1 RF 2 units)	✓ (2 units)	✓ (2 units)	✓ (2 units)

*1: MX370110A LTE TDD IQproducer and MX370110A-001 LTE-Advanced TDD Option installed.
*2: MX269910A LTE TDD IQproducer and MX269910A-001 LTE-Advanced TDD Option installed.
*3: MG3710A-062(2.7GHz)/064(4GHz)/066(6GHz) 2nd RF Option installed.

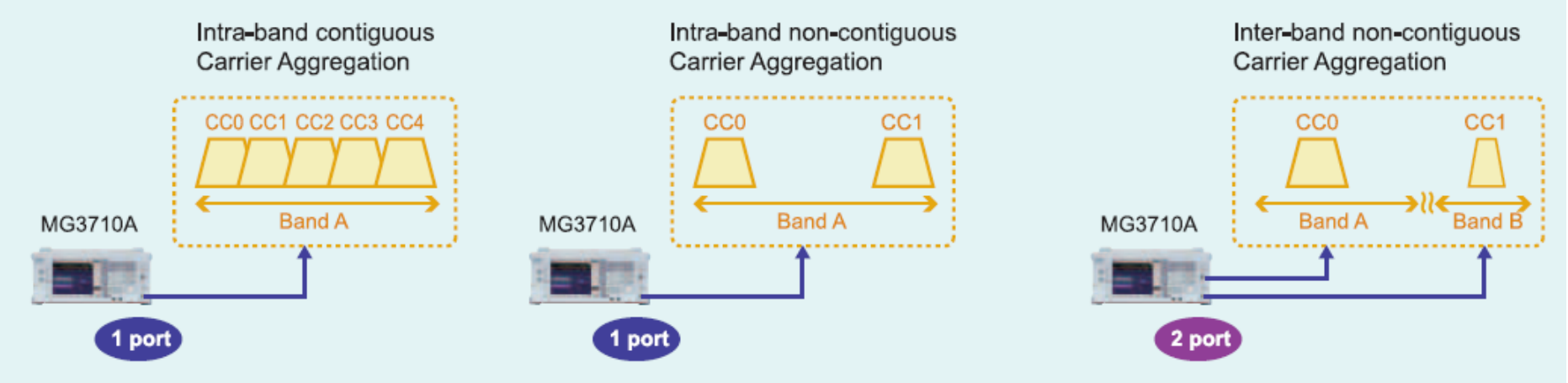
What is LTE TDD IQproducer?

NEW

MX370110A-001 LTE-Advanced TDD Option: for MG3710A

- **MG3710A Vector Signal Generator**
  - One Unit Supports Carrier Aggregation Modes -
  The MG3710A supports an upper frequency limit of 6 GHz and an internal RF modulation bandwidth of 120MHz as well as up to two RF output connectors.
  As a result, one unit supports LTE-Advanced carrier aggregation modes.

Example: MG3710A Supports Carrier Aggregation



Features–LTE TDD IQproducer

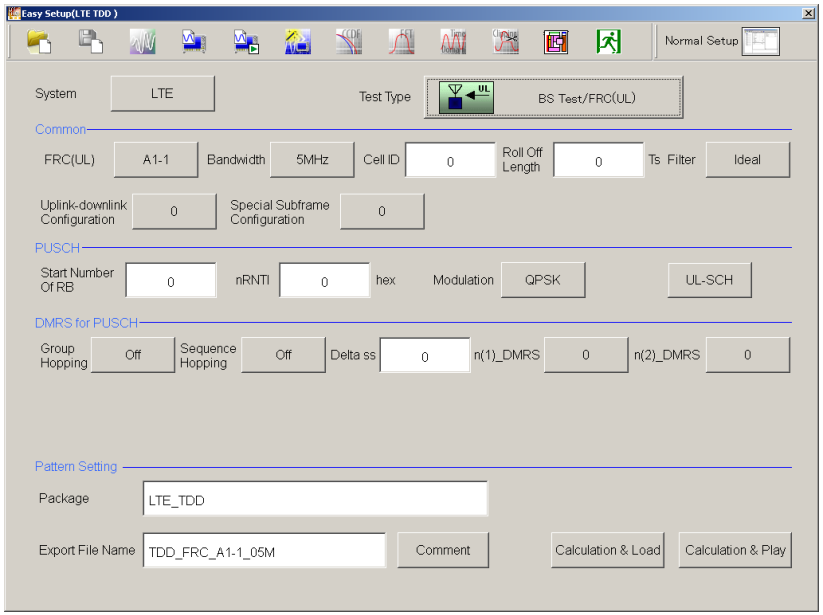
- Easy Setup Screen
- Normal Setup Screen
- Normal Setup Screen: Easy Setup Parameter
- Frame Structure Display for Channel Allocation and OFDM Symbol Power Confirmation
- Supports Spatial Multiplexing and Tx Diversity
- Generates PRACH Signals

Main Screen

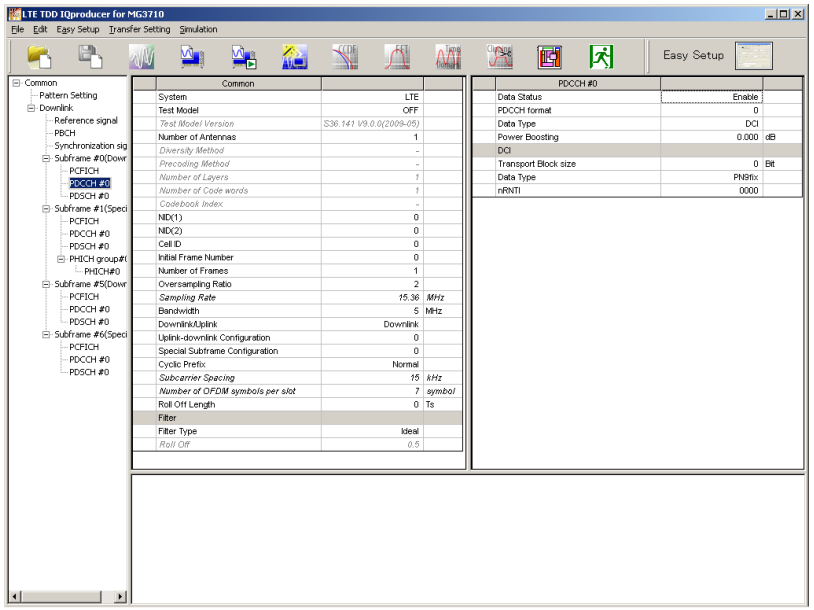
LTE TDD IQproducer supports two setting screens:

“Easy Setup Screen” and “Normal Setup Screen”.

● Easy Setup Screen



●Normal Setup Screen

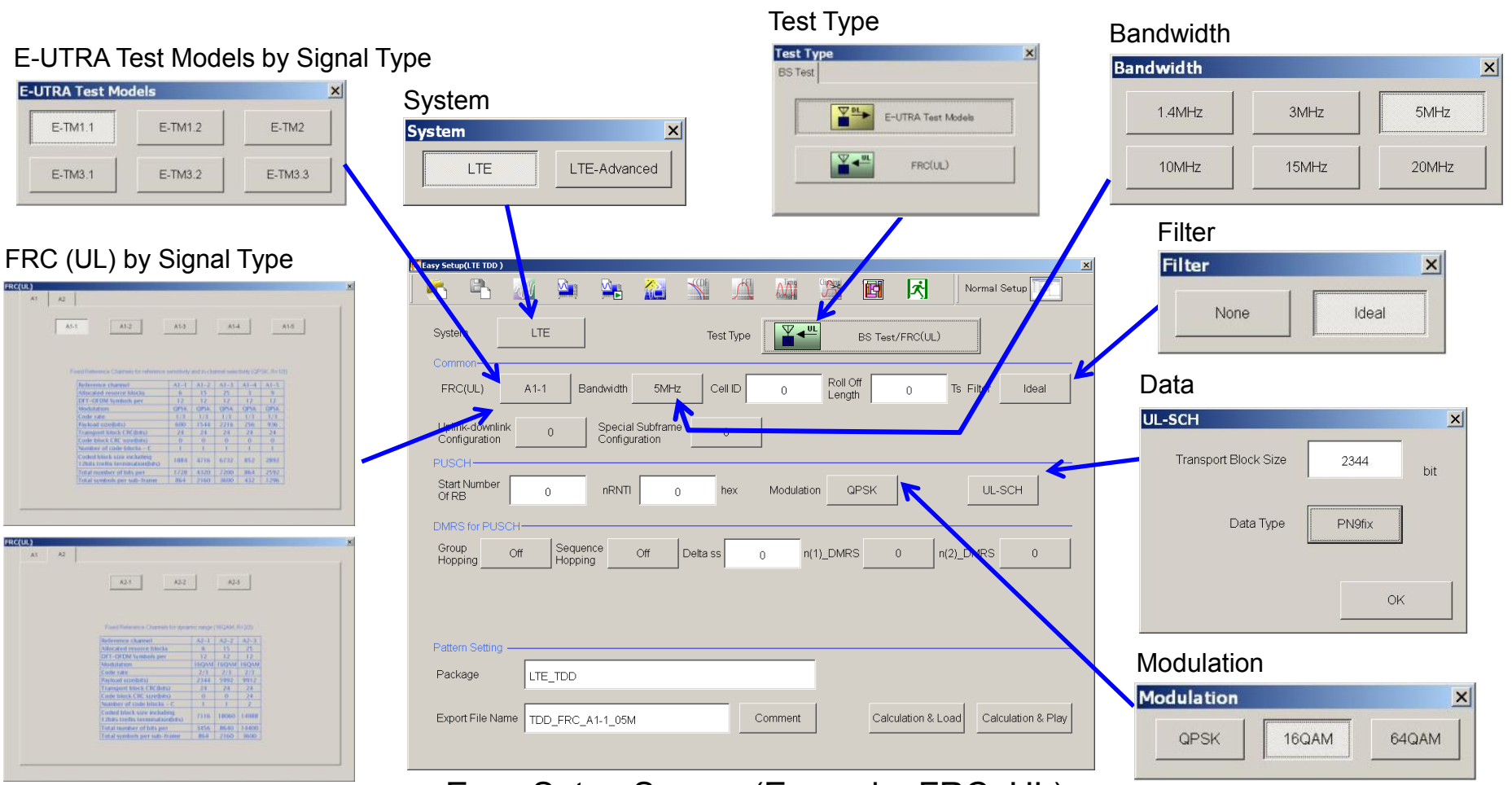


***Read the “MX3701xxA IQproducer” and “MX269xxxA series Software” Brochure for detail parameter setting range.**

Easy Setup Screen

Because it is limited to major parameters, it generates waveform patterns using simple operation. Moreover, touch-panel operation is supported when IQproducer is executed on the MG3710A.

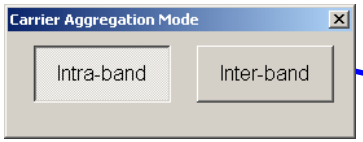
Use “Normal Setup function” for detailed parameter settings.



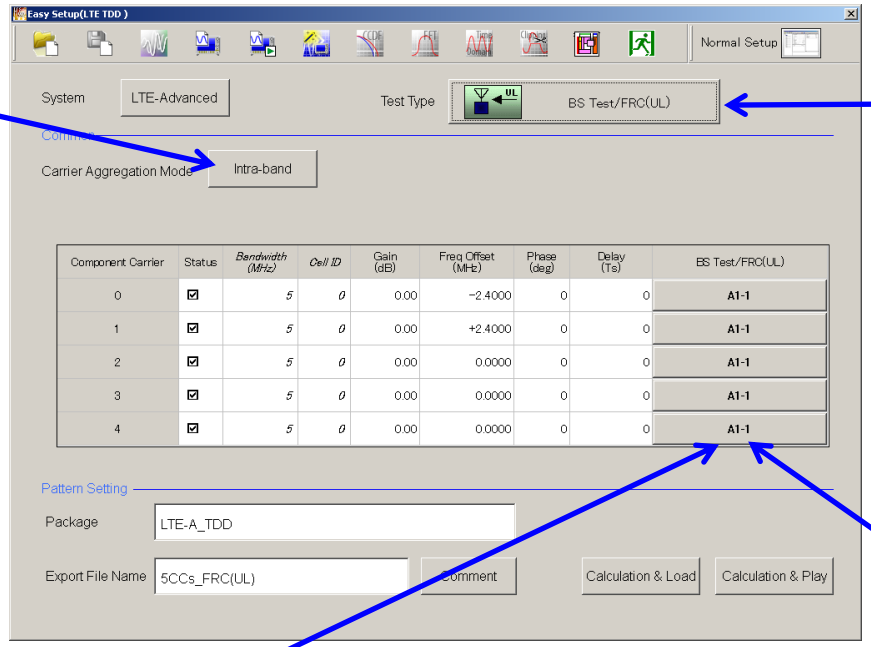
Easy Setup Screen (Example: FRC_UL)

Easy Setup Screen: LTE-Advanced

Carrier Aggregation Mode



Test Type

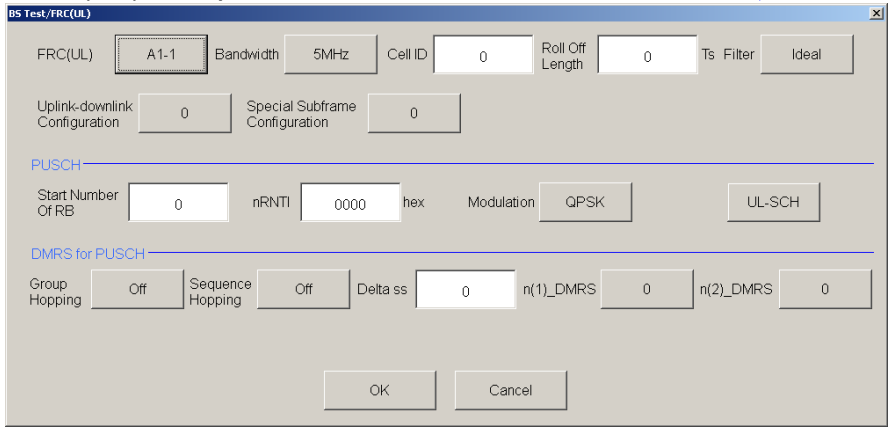


Component Carrier

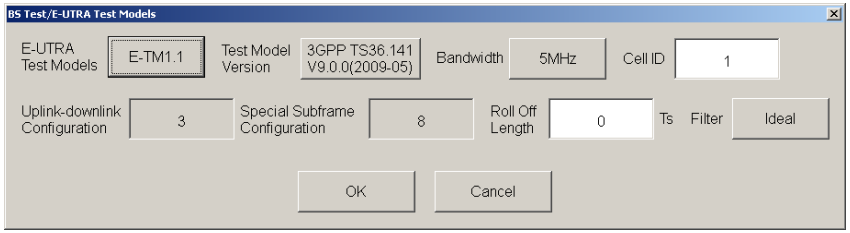
Intra-band
  Component Carrier: #0 to #4
Inter-band
  Band: #0, #1
  Component Carrier: #0 to #4

[Setup Item]
Status, Bandwidth, Cell ID, Gain
Frequency Offset, Phase, Delay

FRC (UL) Setup Screen



E-UTRA Test Models Setup Screen



LTE-Advanced Easy Setup Screen (Example: FRC(UL)Test Modes)

Normal Setup Screen

Generates test model and RMC (Reference Measurement Channel) waveform patterns used for LTE base station TRx tests and FRC (Fixed Reference Channel) waveform patterns used for LTE UE TRx tests.

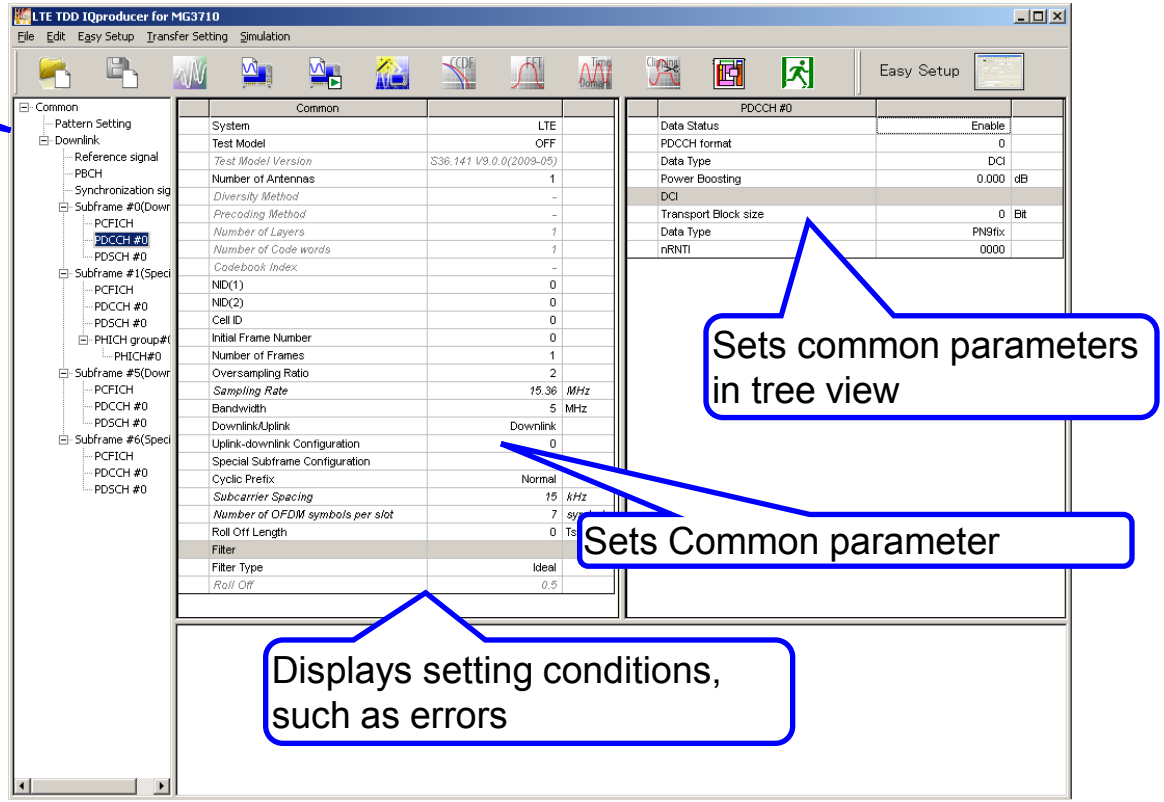
Displays PHY/MAC parameter items as tree

Channels Generated
by MX370110A LTE TDD IQproducer

Downlink
- Cell-specific Reference Signal
- Primary Synchronization Signal
- Secondary Synchronization Signal
- PBCH (Physical Broadcast Channel)
- PCFICH (Physical Control Format Indicator Channel)
- PDCCH (Physical Downlink Control Channel)
- PDSCH (Physical Downlink Shared Channel)
- PHICH (Physical Hybrid-ARQ Indicator Channel)

Uplink
- PUCCH (Physical Uplink Control Channel)
- PUSCH (Physical Uplink Shared Channel)
- Demodulation Reference Signal for PUCCH/PUSCH
- Random Access Preamble
- PRACH (Physical Random Access Channel)

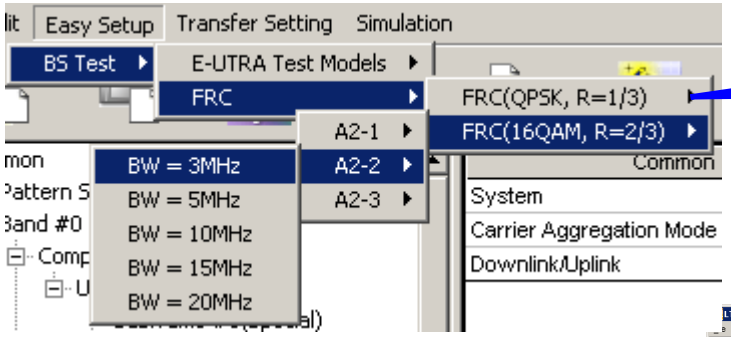
Normal Setup Screen



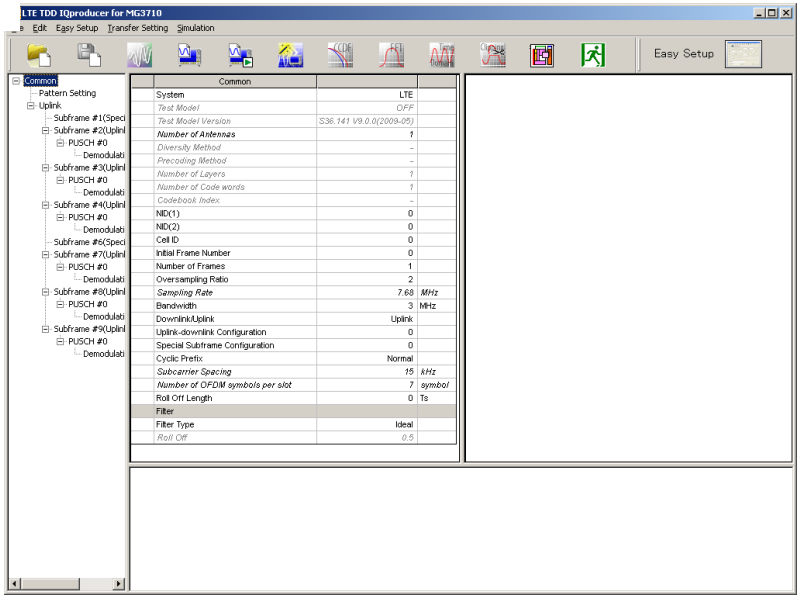
***Read the "MX3701xxA IQproducer" and "MX269xxxA series Software" Brochure for detail parameter setting range.**

Normal Setup Screen: Easy Setup Parameter

Using Easy Setup Menu sets typical parameter values as a batch for 3GPP-defined test signals. Change only the required parts to use.



Select 3GPP-defined test signals

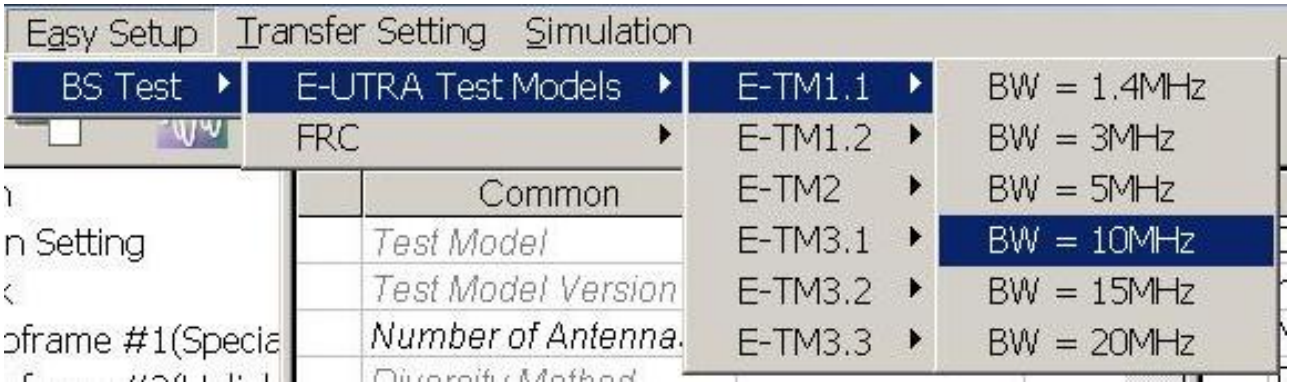


Batch setting of each parameter for selected tests

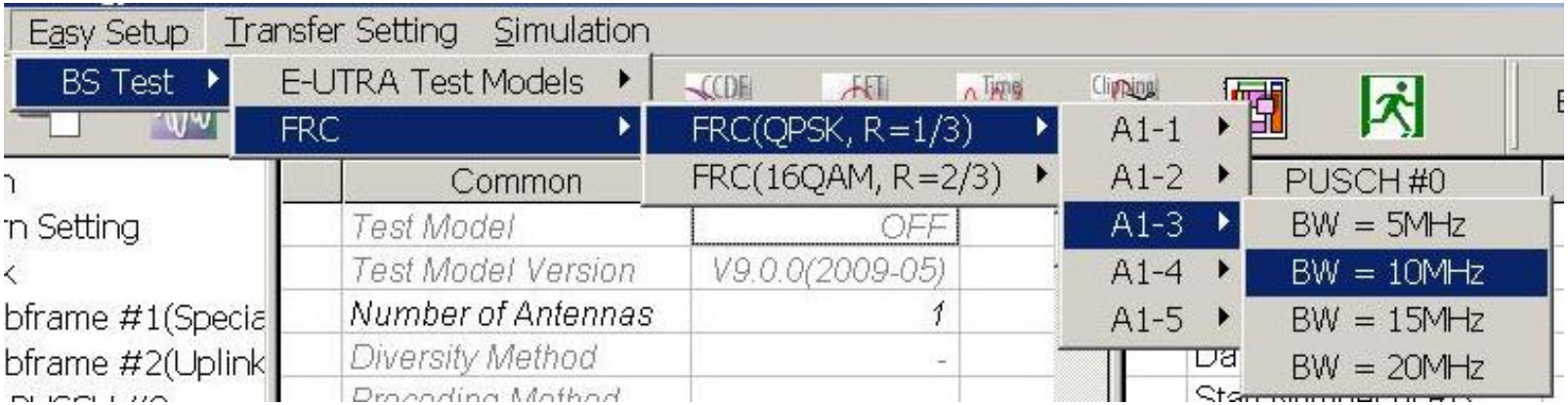
The Easy Setup Menu sets typical parameter values for 3GPP-defined test signals as a batch.

Normal Setup Screen: Easy Setup Parameter

BS Test / E-UTRA Test Models

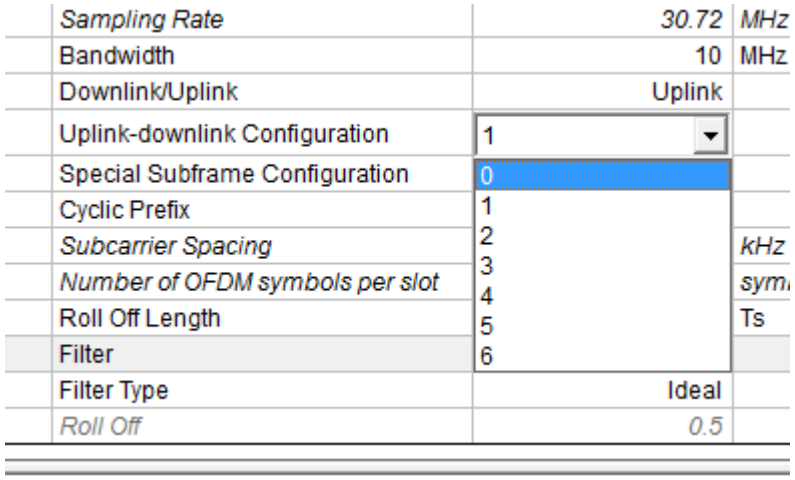


BS Test / FRC



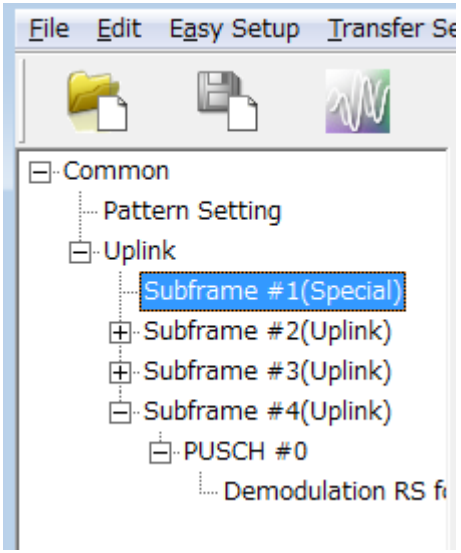
Subframe Type

Displays the Subframe type. "D" indicates Downlink Subframe, "U" indicates Uplink Subframe, and "S" indicates Special Subframe. Downlink Subframe is displayed when Downlink/Uplink is set to Downlink, Uplink Subframe is displayed when Downlink/Uplink is set to Uplink.



Subframe	Uplink-downlink Configuration						
	0	1	2	3	4	5	6
0	D	D	D	D	D	D	D
1	S	S	S	S	S	S	S
2	U	U	U	U	U	U	U
3	U	U	D	U	U	D	U
4	U	D	D	U	D	D	U
5	D	D	D	D	D	D	D
6	S	S	S	D	D	D	S
7	U	U	U	D	D	D	U
8	U	U	D	D	D	D	U
9	U	D	D	D	D	D	D

Example) Uplink, Configuration = 3



Normal Setup Screen: LTE-Advanced

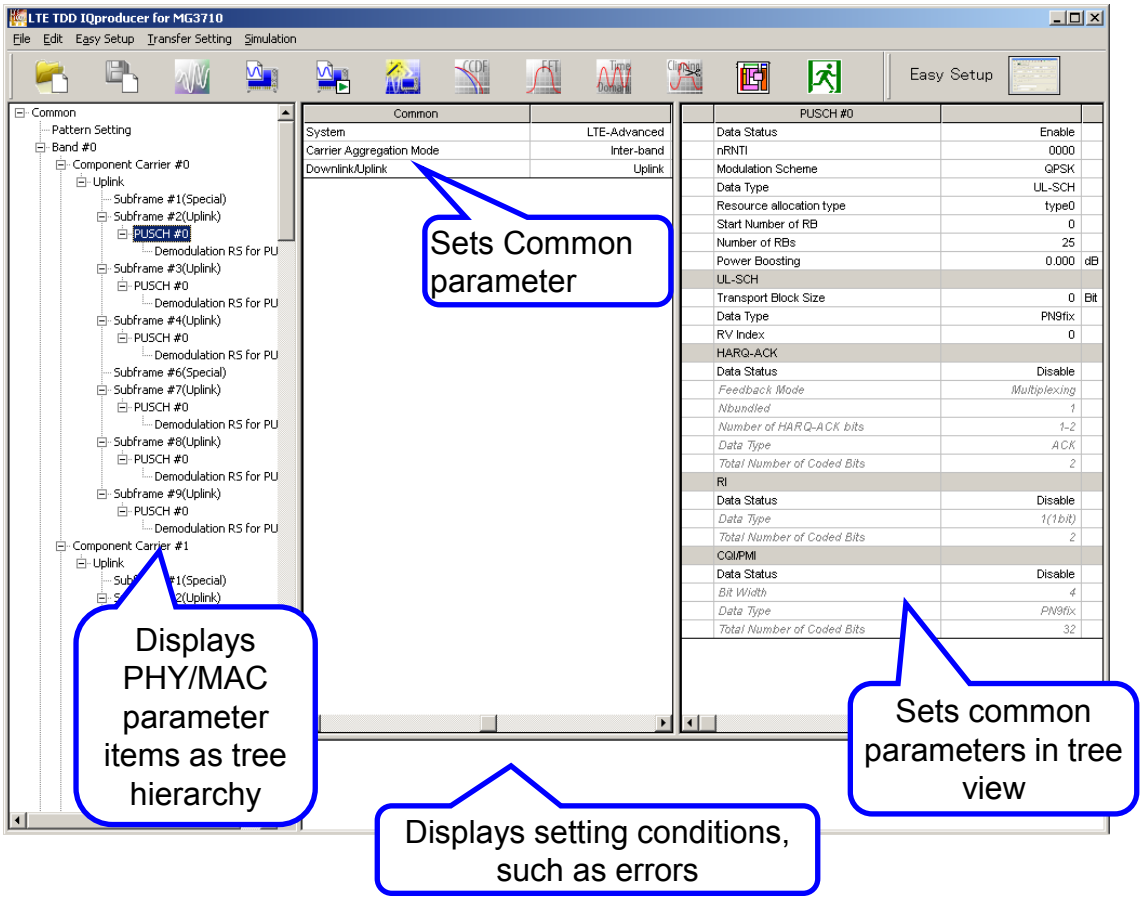
This screen is used to set detailed parameters, such as the carrier aggregation mode and component carriers for LTE-Advanced waveforms.

Carrier Aggregation Mode

Intra-band
Component Carrier #0 to #4

Inter-band
Band #0, #1
Component Carrier #0 to #4

Normal Setup Screen

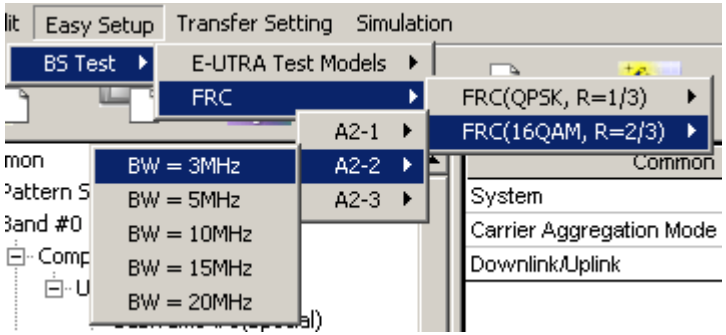


***Read the "MX3701xxA IQproducer" and "MX269xxxA series Software" Brochure for detail parameter setting range.**

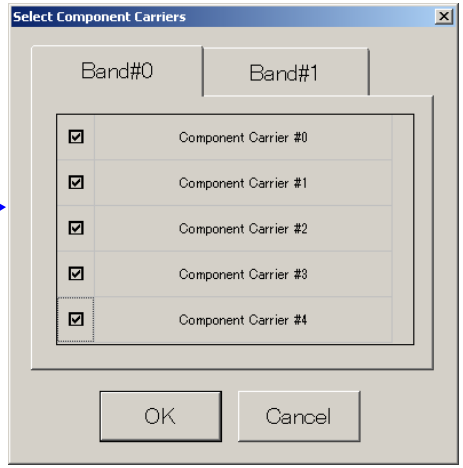
Normal Setup Screen: LTE-Advanced Easy Setup Parameter

Selecting target signals at the Easy Setup Parameter function of the Normal Setup Screen supports batch setting of parameters matching component carriers with standards.

Example: FRC Setup



Select Component Carrier Screen



Simple operation by selecting target signals and component carriers as batch

***Read the "MX3701xxA IQproducer" and "MX269xxxA series Software" Brochure for detail parameter setting range.**

Frame Structure Screen

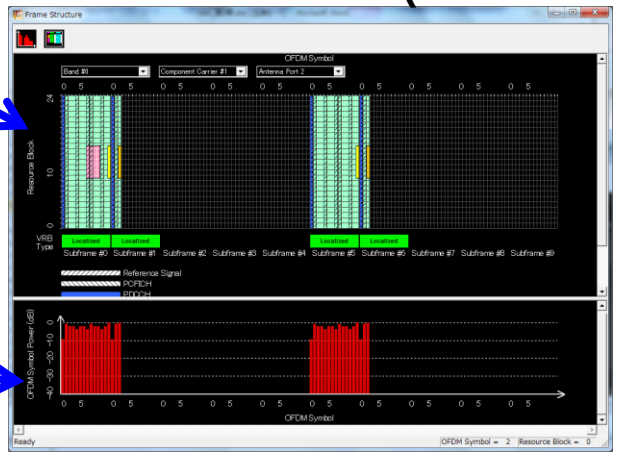
Clicking the [Frame Structure] icon opens the Frame Structure screen. It is useful for checking the power of each OFDM symbol and channel allocation status and.

Frame Structure

Frame Structure Screen(LTE)

Graphical display of allocation of each channel
Y-axis: Frequency (Resource Block units)
X-axis: Time (OFDM Symbol units)

Frame Structure Screen(LTE-Advanced)



Displays relative level with OFDM Symbol with maximum power as 0 dB
Y-axis: OFDM Symbol Power
X-axis: Time (OFDM Symbol units)

Supports Spatial Multiplexing and Tx Diversity

MIMO signal parameters (Spatial Multiplexing/Tx Diversity) for downlink can be set by setting the number of received antennas to 2 or 4 at the Common Parameter Setting screen.

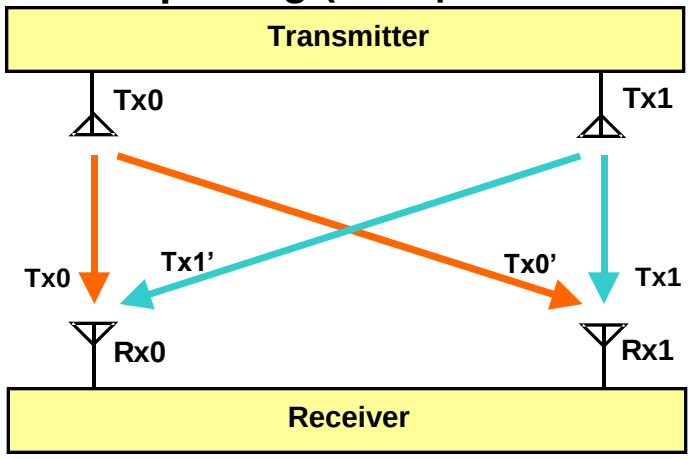
Number of Antennas parameter setting

Common	
System	LTE
Test Model	OFF
Test Model Version	*6.141 V9.0.0(2009-05)*
Number of Antennas	1
Diversity Method	1
Precoding Method	2
Number of Layers	4

Diversity Methodpa parameter setting

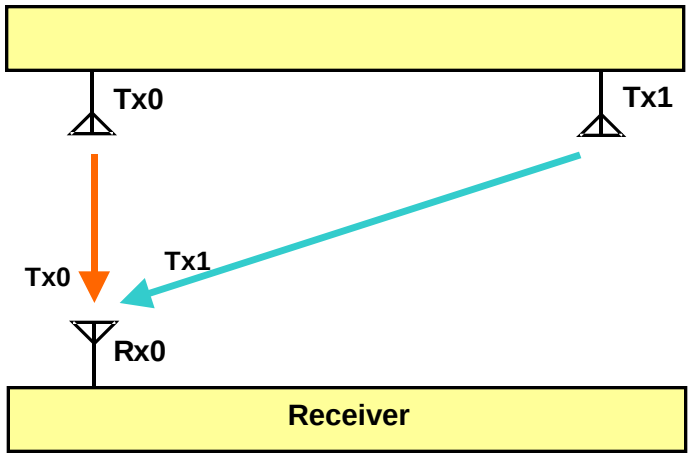
Common	
System	LTE
Test Model	OFF
Test Model Version	*6.141 V9.0.0(2009-05)*
Number of Antennas	4
Diversity Method	Spatial Multiplexing
Precoding Method	Spatial Multiplexing
Number of Layers	Tx Diversity

Spatial Multiplexing (Example of two antennas)



Channel capacity and data rate doubled

Tx Diversity (Example of two antennas)



Coverage at cell edge upgraded by improving reliability for fading signals and lowering available SNR

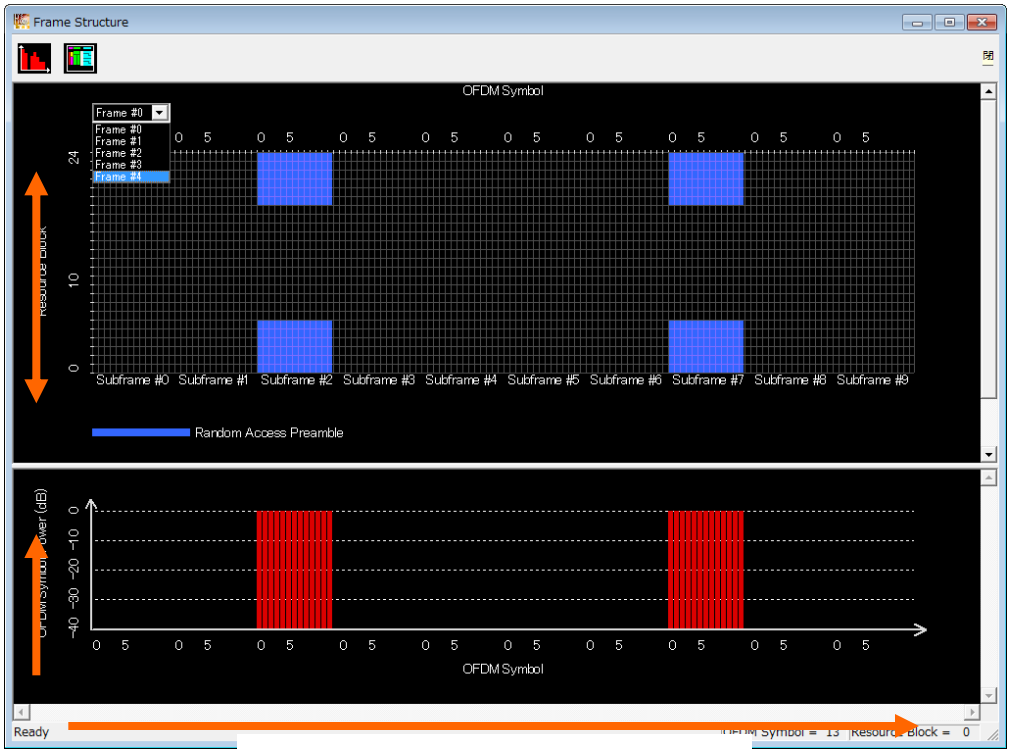
PRACH Setting

PRACH signal parameters for frequency hopping and power ramping can be set when PRACH is selected at Uplink Parameter Setting.

PRACH Parameter Setting

Uplink	
Transmission Type	Data Transmission
DMRS Parameters	Data Transmission
PUCCH Parameters	PRACH

PRACH



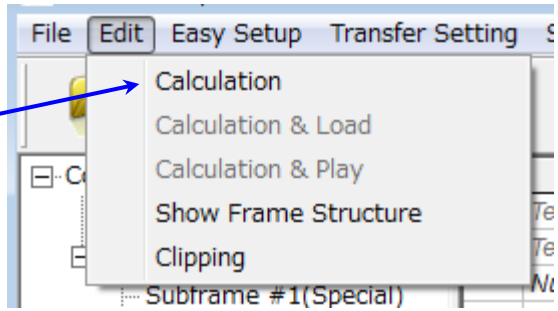
Frequency (RB units)

Power

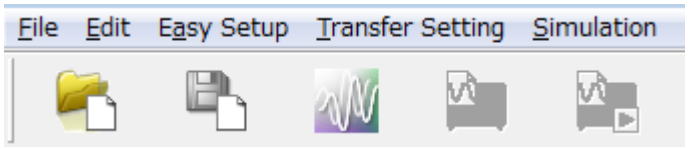
Time (OFDM Symbol units)

Waveform Generation: Calculation

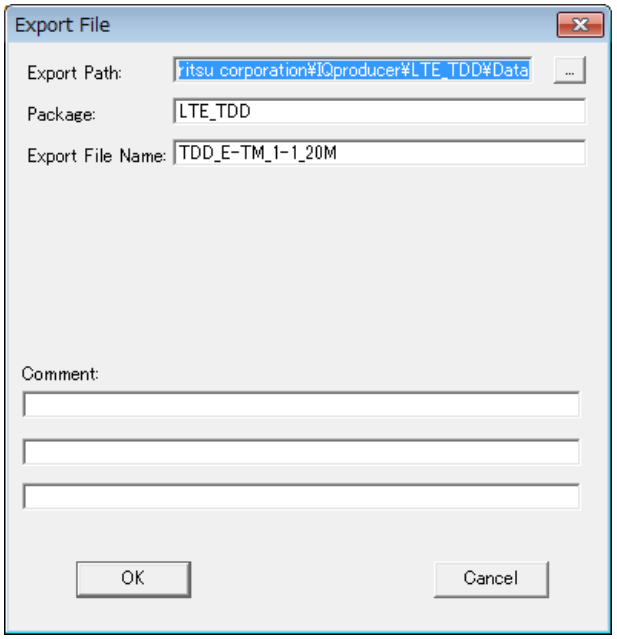
After setting parameters, click the [Calculation] icon to generate the waveform pattern.



Generates waveform pattern



Generates waveform pattern



File export destination folder

Name of waveform pattern package: 31 characters max.

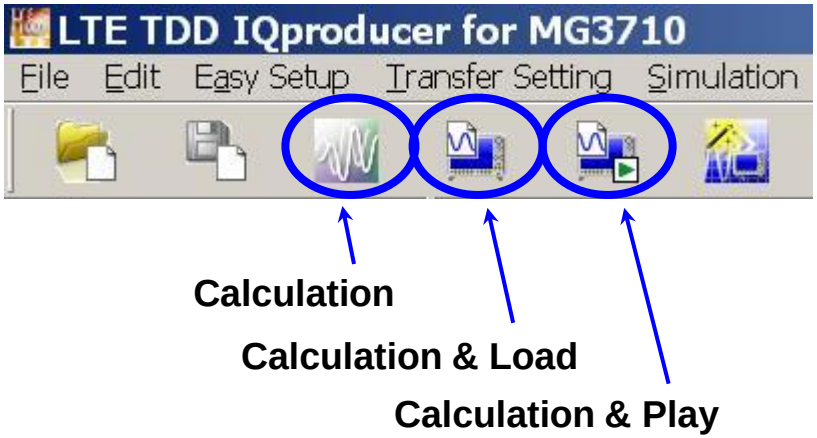
Name of waveform pattern file: 20 characters max.

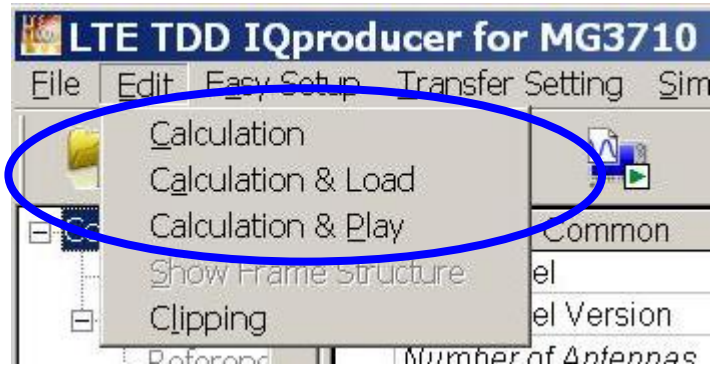
Comment on screen
38 characters max. per line

Calculation & Load & Play

MG3710A only

After setting parameters, click the [Calculation] icon to generate the waveform pattern.





Calculation:

Generates a waveform pattern after parameters are set.
/Calculation/

Calculation & Load:

After waveform generation is finished, the created waveform pattern is loaded into the MG3710A waveform memory.
/Calculation/ > /Load/

Calculation & Play:

After waveform generation is finished, the created waveform pattern is loaded and selected at the MG3710A waveform memory.
/Calculation/ > /Load/ > /Select/

File size of waveform patterns

MG3710A only

The presence/absence of the ARB Memory Expansion (option) and Baseband Signal Combination Function (option) is selected. Selecting the ARB Memory Expansion (option) and the Baseband Signal Combination Function (option) generates a bigger waveform pattern, while selecting the Baseband Signal Combination Function (option) generates a waveform pattern. If an uninstalled option is selected, sometimes the created waveform pattern may not be usable. Set the combination of installed options based on the following setting items.

Items	Combinations of Options
Memory 64M samples	None
Memory 64M samples × 2	Option48 and Option 78
Memory 256M samples	Option45 or Option 75
Memory 256M samples × 2	Option 45 and Option 48 or Option 75 and Option 78
Memory 1024M samples	Option46 or Option 76
Memory 1024M samples × 2	Option 46 and Option 48 or Option 76 and Option 78

The maximum size of the generated waveform pattern for each of the setting items is shown below.

Items	Maximum Size
Memory 64M samples	64M samples
Memory 64M samples × 2 (With Option48, 78)	128M samples
Memory 256M samples	256M samples
Memory 256M samples × 2 (With Option48, 78)	512M samples
Memory 1024M samples	512M samples
Memory 1024M samples × 2 (With Option48, 78)	512M samples

File size of waveform patterns

MS269xA/MS2830A only

MS2830A:

Select whether the ARB memory expansion option 256Msamples is installed.

Selecting With Option27 (Memory 256M samples) supports creation of larger waveform patterns. If the ARB memory expansion option is not installed, the generated waveform pattern may not be able to be used. Waveform patterns cannot be created with a size greater than 64M samples when Without Option27 (Memory 256M samples) is selected. Select either according to the presence of ARB memory expansion option.

Model	Items	ARB Memory Expansion
MS2830A	With Option27 (Memory 256M samples)	1 GB
	Without Option27 (Memory 256M samples)	256 MB

MS269xA:

ARB Memory Expansion (option) is not available for MS269xA. Only Memory 256M samples, 1 GB is available.

Note

Anritsu

Specifications are subject to change without notice.

• **United States**
Anritsu Company
1155 East Collins Blvd., Suite 100, Richardson,
TX 75081, U.S.A.
Toll Free: 1-800-267-4878
Phone: +1-972-644-1777
Fax: +1-972-671-1877

• **Canada**
Anritsu Electronics Ltd.
700 Silver Seven Road, Suite 120, Kanata,
Ontario K2V 1C3, Canada
Phone: +1-613-591-2003
Fax: +1-613-591-1006

• **Brazil**
Anritsu Eletrônica Ltda.
Praça Amadeu Amaral, 27 - 1 Andar
01327-010 - Bela Vista - São Paulo - SP - Brazil
Phone: +55-11-3283-2511
Fax: +55-11-3288-6940

• **Mexico**
Anritsu Company, S.A. de C.V.
Av. Ejército Nacional No. 579 Piso 9, Col. Granada
11520 México, D.F., México
Phone: +52-55-1101-2370
Fax: +52-55-5254-3147

• **United Kingdom**
Anritsu EMEA Ltd.
200 Capability Green, Luton, Bedfordshire, LU1 3LU, U.K.
Phone: +44-1582-433200
Fax: +44-1582-731303

• **France**
Anritsu S.A.
12 avenue du Québec, Bâtiment Iris 1- Silic 612,
91140 VILLEBON SUR YVETTE, France
Phone: +33-1-60-92-15-50
Fax: +33-1-64-46-10-65

• **Germany**
Anritsu GmbH
Nemetschek Haus, Konrad-Zuse-Platz 1
81829 München, Germany
Phone: +49-89-442308-0
Fax: +49-89-442308-55

• **Italy**
Anritsu S.r.l.
Via Elio Vittorini 129, 00144 Roma, Italy
Phone: +39-6-509-9711
Fax: +39-6-502-2425

• **Sweden**
Anritsu AB
Borgarfjordsgatan 13A, 164 40 KISTA, Sweden
Phone: +46-8-534-707-00
Fax: +46-8-534-707-30

• **Finland**
Anritsu AB
Teknobulevardi 3-5, FI-01530 VANTAA, Finland
Phone: +358-20-741-8100
Fax: +358-20-741-8111

• **Denmark**
Anritsu A/S (Service Assurance)
Anritsu AB (Test & Measurement)
Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

• **Russia**
Anritsu EMEA Ltd.
Representation Office in Russia
Tverskaya str. 16/2, bld. 1, 7th floor.
Russia, 125009, Moscow
Phone: +7-495-363-1694
Fax: +7-495-935-8962

• **United Arab Emirates**
Anritsu EMEA Ltd.
Dubai Liaison Office
P O Box 500413 - Dubai Internet City
Al Thuraya Building, Tower 1, Suit 701, 7th Floor
Dubai, United Arab Emirates
Phone: +971-4-3670352
Fax: +971-4-3688460

• **India**
Anritsu India Private Limited
2nd & 3rd Floor, #837/1, Binnamangla 1st Stage,
Indiranagar, 100ft Road, Bangalore - 560038, India
Phone: +91-80-4058-1300
Fax: +91-80-4058-1301

• **Singapore**
Anritsu Pte. Ltd.
60 Alexandra Terrace, #02-08, The Comtech (Lobby A)
Singapore 118502
Phone: +65-6282-2400
Fax: +65-6282-2533

• **P.R. China (Shanghai)**
Anritsu (China) Co., Ltd.
Room 1715, Tower A CITY CENTER of Shanghai,
No.100 Zunyi Road, Chang Ning District,
Shanghai 200051, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

• **P.R. China (Hong Kong)**
Anritsu Company Ltd.
Unit 1006-7, 10/F., Greenfield Tower, Concordia Plaza,
No. 1 Science Museum Road, Tsim Sha Tsui East,
Kowloon, Hong Kong, P.R. China
Phone: +852-2301-4980
Fax: +852-2301-3545

• **Japan**
Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-1221
Fax: +81-46-296-1238

• **Korea**
Anritsu Corporation, Ltd.
502, 5FL H-Square N B/D, 681
Sampyeong-dong, Bundang-gu, Seongnam-si,
Gyeonggi-do, 463-400 Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• **Australia**
Anritsu Pty. Ltd.
Unit 21/270 Ferntree Gully Road, Notting Hill,
Victoria 3168, Australia
Phone: +61-3-9558-8177
Fax: +61-3-9558-8255

• **Taiwan**
Anritsu Company Inc.
7F, No. 316, Sec. 1, NeiHu Rd., Taipei 114, Taiwan
Phone: +886-2-8751-1816
Fax: +886-2-8751-1817

1209

Please Contact:

Printed on Recycled Paper

No. MX370110A/MX269910A-E-L-1-(2.00) 公知 Printed in Japan 2013-3 MG