

MX370109A/MX269909A XG-PHS IQproducer™ Operation Manual

Fifth Edition

- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MG3700A Vector Signal Generator Operation Manual (Mainframe), MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe) , or MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation). Please also refer to either of these documents before using the equipment.
- Keep this manual with the equipment.

ANRITSU CORPORATION

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Symbols used in manual



DANGER

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



WARNING

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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.

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



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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.

MX370109A/MX269909A
XG-PHS IQproducer™
Operation Manual

31 October 2008 (First Edition)
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- 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 Computer Virus Infections

Prior to the software installation

Before installing this software or any other software recommended or approved by Anritsu, run a virus scan on your computer, including removable media (e.g. USB memory stick and CF memory card) you want to connect to your computer.

When using this software and connecting with the measuring instrument

- Copying files and data

On your computer, do not save any copies other than the following:

- Files and data provided by Anritsu
- Files created by this software
- Files specified in this document

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Connect your computer to the network that provides adequate protection against computer viruses.

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- Simultaneously running any software other than that recommended or approved by Anritsu
- Closing the lid (Laptop computer)
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1. Product Model

Software: MX370109A/MX269909A XG-PHS IQproducer™

2. Applied Directive and Standards

When the MX370109A/MX269909A XG-PHS IQproducer™ is installed in the MG3710A, or MS2690A/MS2691A/MS2692A, the applied directive and standards of this software conform to those of the MG3710A, or MS2690A/MS2691A/MS2692A main frame.

PS: About main frame

Please contact Anritsu for the latest information on the main frame types that MX370109A/MX269909A can be used with.

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C-tick marking



1. Product Model

Software: MX370109A/MX269909A XG-PHS IQproducer™

2. Applied Directive and Standards

When the MX370109A/MX269909A XG-PHS IQproducer™ is installed in the MG3710A, or MS2690A/MS2691A/MS2692A, the applied directive and standards of this software conform to those of the MG3710A, or MS2690A/MS2691A/MS2692A main frame.

PS: About main frame

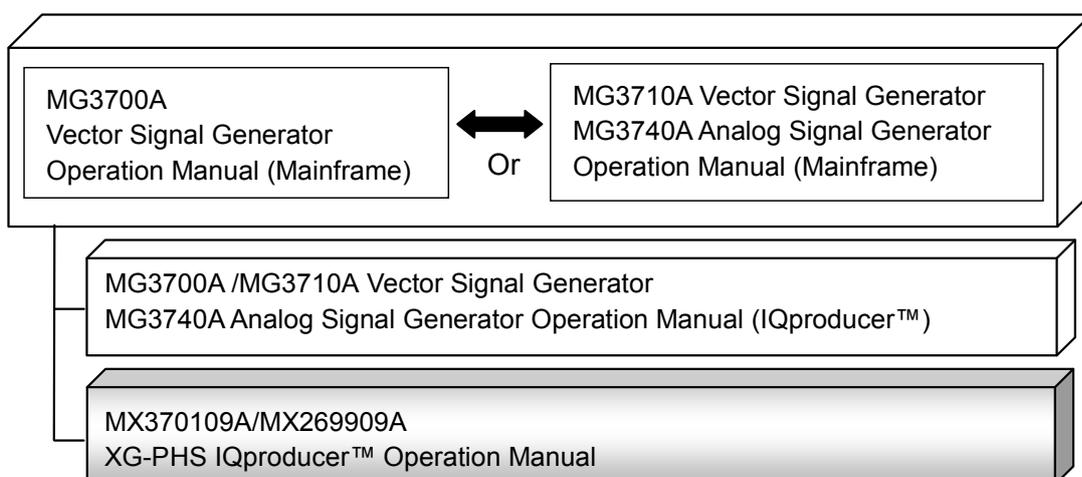
Please contact Anritsu for the latest information on the main frame types that MX370109A/MX269909A can be used with.

About This Manual

■Associated Documents

The operation manual configuration of the MX370109A/MX269909A XG-PHS IQproducer™ is shown below.

■If using MG3700A or MG3710A:



- MG3700A Vector Signal Generator Operation Manual (Mainframe)

This describes basic operations, maintenance procedure, and remote functions of the MG3700A Vector Signal Generator.



- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)

This describes basic operations, maintenance procedure, and remote functions of the MG3710A Vector Signal Generator and the MG3740A Analog Signal Generator.

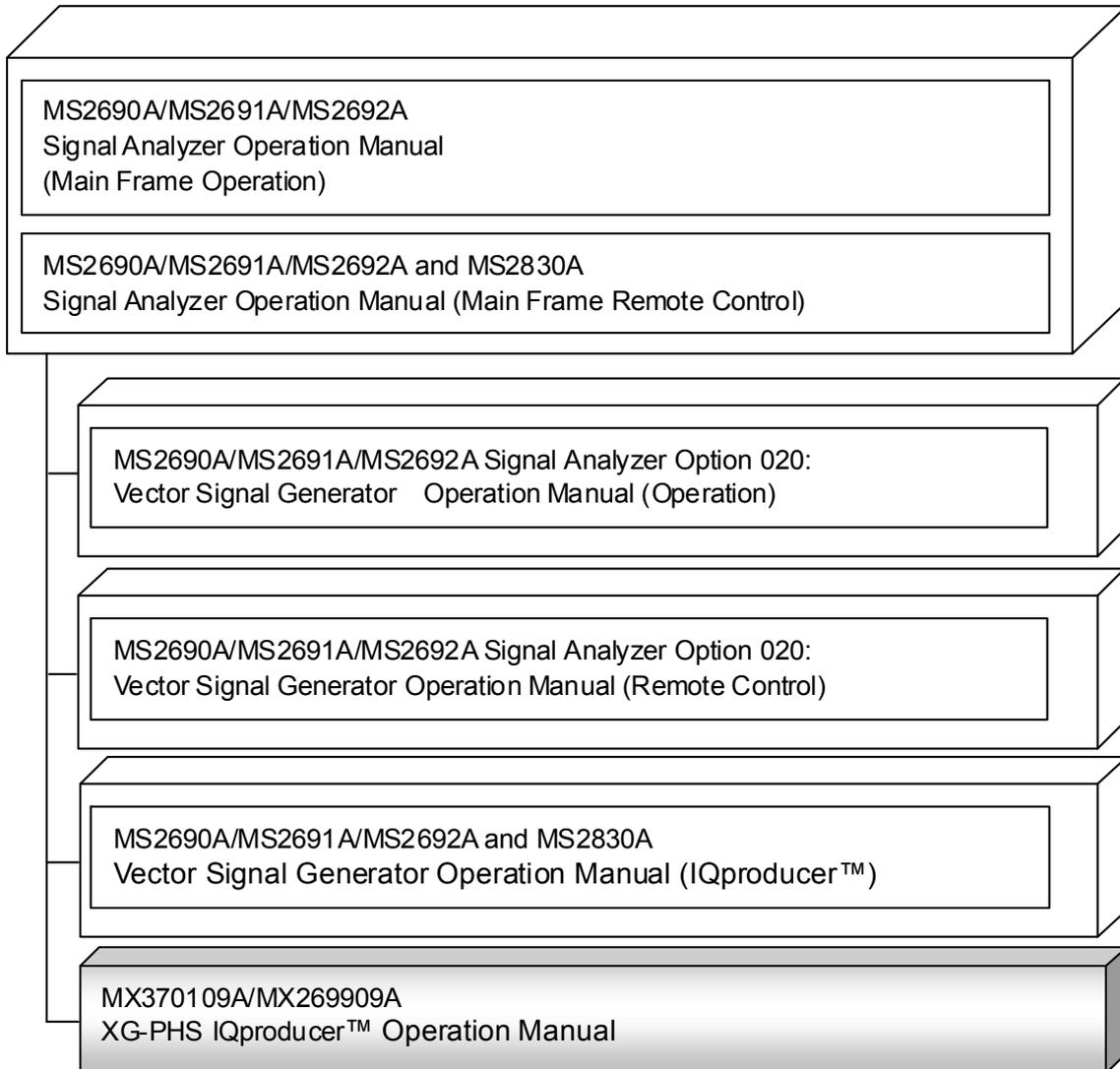
- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)

This describes the functions and how to use the IQproducer, which is Windows software for the Vector Signal Generator and the Analog Signal Generator.

- XG-PHS IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the XG-PHS IQproducer™.

■If using MS2690A/MS2691A/MS2692A:



- MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe, Operation)

This describes basic operations, maintenance procedure, common functions and common remote functions of the MS2690A/MS2691A/MS2692A.

- MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe, Remote Control)

These describe basic operations, maintenance procedure, common functions and common remote functions of the MS2690A/MS2691A/MS2692A or MS2830A.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual, Operation

This describes the functions and how to use the Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual, Remote Control

This describes how to remotely control the Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)

This describes the functions and how to use the IQproducer, which is Windows software for the Vector Signal Generator option.

- XG-PHS IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the XG-PHS IQproducer™.

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Chapter 1 Overview

This chapter provides an overview of the MX370109A/MX269909A XG-PHS IQproducer™.

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1.1 Overview

MX370109A/MX269909A XG-PHS IQproducer™ (hereinafter referred to as “this software”) is software used to generate waveform patterns conforming to the Physical Channel Specification of the Next Generation PHS Specification.

This software requires either of the following environment:

- MG3710A Vector Signal Generator
- MS2690A/MS2691A/MS2692A Signal Analyzer with Vector Signal Generator option mounted
- Personal computer (hereinafter, “PC”)

This software generates waveform patterns that support the specifications of XG-PHS with various characteristics. This is made possible by the editing/customizing of parameters according to its use.

A waveform pattern created by this software can be output using an RF signal after being downloaded into the MG3700A Vector Signal Generator ,MG3710A Vector Signal Generator , or an MS2690A/MS2691A/MS2692A Signal Analyzer with Vector Signal Generator option installed (collectively referred to as “mainframe”, or “this equipment”).

1.2 Product Composition

The following table lists the model name and specifications of this software according to the equipment.

Table 1.2-1 Restrictions

Mainframe Restrictions	MG3700A	MG3710A	MS2690A MS2691A MS2692A
Software name	MX370109A		MX269909A
Maximum Size of Waveform Patterns	256 M sample 512 M sample* ¹	64 M sample 128 M sample* ⁴ 256 M sample* ⁵ 512 M sample* ⁶	256 M sample
Transmission method of Waveform Patterns	LAN, CompactFlash Card	External device such as LAN, USB memory* ²	USB Memory and other external device * ²
Installation of this software to this equipment	N/A	Possible	Possible * ³

- *1: The ARB memory expansion 512M sample (optional) must be installed into the MG3700A to use waveform patterns that exceed 256 M samples.
- *2: Transferring waveform patterns is not required if the waveform patterns are created on the equipment using this software.
- *3: Although this software can be installed and run in the MS2690A/MS2691A/MS2692A, the measurement functions of the MS2690A/MS2691A/MS2692A are not guaranteed while this software runs.
- *4: The Combination of Baseband Signal (optional) must be installed into the MG3710A to use waveform patterns of maximum 128 M samples.
- *5: The ARB memory expansion 256M sample (optional) must be installed into the MG3710A to use waveform patterns of maximum 256 M samples.

*6: To use waveform patterns of maximum 512 M samples, either of the following must be installed into MG3710A:

- ARB memory expansion 1024 M sample (optional)
- ARB memory expansion 256 M (optional) and Combination of Baseband Signal (optional)

■Notes on waveform pattern conversion

The waveform patterns generated with this software varies according to the main unit type. If using the waveform pattern to the different main unit, you need to convert the waveform pattern.

For details about how to convert a waveform pattern, refer to each one of the following manuals.

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
4.5 “File Conversion on Convert Screen”
- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
4.5 “File Conversion on Convert Screen”

Chapter 2 Preparation

This chapter describes the operating environment for the MX370109A/MX269909A.

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2.1 Operating Environment

The following environment is required for operating the MX370109A/MX269909A.

- (1) PC that meets the following conditions

OS	Windows XP/Windows Vista/Windows 7
CPU	Pentium III 1 GHz equivalent or faster
Memory	512 MB or more
Hard disk space	5 GB or more free space in the drive where this software is to be installed. The free hard disk space necessary to create waveform pattern varies depending on the waveform pattern size. The free disk space of 27 GB or greater is required to create four maximum (512 Msample) waveform patterns.

- (2) If viewing on PC, displays with a resolution of 1024 × 768 pixels are best viewed using a small font setting.

2.2 Installation/Uninstallation

This software is included in the IQproducer™ installer. It is automatically installed by installing the IQproducer™ that is supplied with this equipment or this software. When using a waveform pattern created using this software in the equipment, the license file must be installed in advance.

■ Installing/Uninstalling IQproducer™

For how to install and uninstall IQproducer™, refer to each of the following manuals:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
Chapter 2 “Installation”
- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
Chapter 2 “Installation”

■ Installing/Uninstalling IQproducer™ license file

For how to install license file to MG3700A/MG3710A, refer to the following manual:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
5.1 “Installing License File”

For how to uninstall license file from MG3700A/MG3710A, refer to each one of the following manuals:

- MG3700A Vector Signal Generator Operation Manual (Mainframe)
3.10.10 “Install”
- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)
9.4.4 “Install”

Refer to the following manual for details of how to install/uninstall license file to MS2690A/MS2691A/MS2692A with Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
2.2 “Installation/Uninstallation”

2.3 Starting up and exiting the software

This section explains how to start and stop this software.

Note:

The following explanation assumes the use of Windows XP. The screen image may differ slightly if not using Windows XP.

2.3.1 Starting Software: When installed on other than MG3710A

Start this software using the following procedure.

The example assumes that it is a PC operation.

<Procedure>

1. Click **Start** on the task bar, and point to **All Programs**. Next, point to **Anritsu Corporation**, point to **IQproducer**, and then click **IQproducer**.
2. When IQproducer™ starts, the **Select instrument** screen is displayed.

On the **Select instrument** screen, select the model of the main unit that uses the waveform patterns created by IQproducer™.

Notes:

- This software does not support MS2830A and MG3740A.
- To hide this screen and to start with the selected mainframe's screen from the next time, select the **Don't show this window next time** check box.

- The common platform screen is displayed when **OK** is clicked in the **Select instrument** screen.

The common platform screen is a screen used to select each function of the IQproducer™.

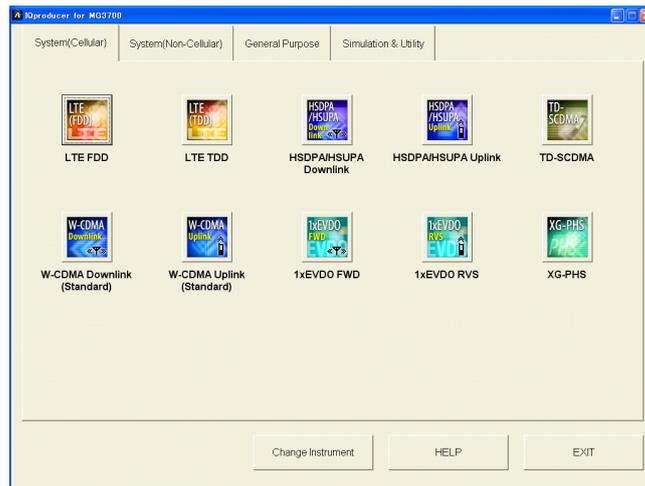


Figure 2.3.1-1 Common Platform Screen

- Click the **System (Cellular)** tab on the common platform screen, to show the **System (Cellular)** selection screen that supports each telecommunication system.

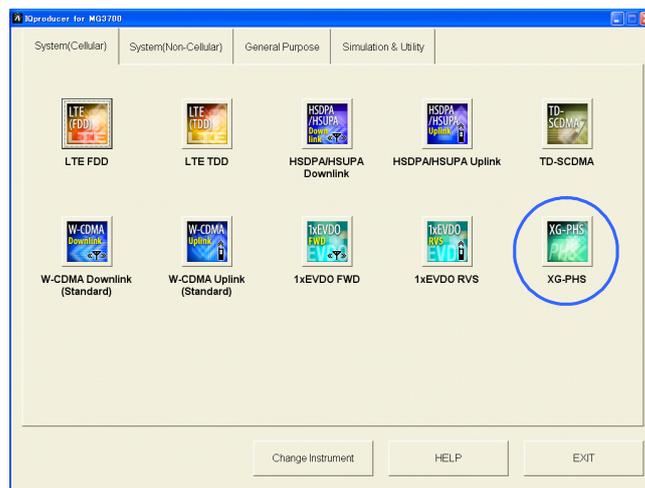


Figure 2.3.1-2 System (Cellular) Selection Screen

- Click **XG-PHS** to display the main screen. For details of the main screen, refer to Chapter 3 “Detailed Description of Functions”.

Note:

If **Change Instrument** is clicked, the **Select instrument** screen will appear each time the software is loaded.

2.3.2 Starting Software: When installed on MG3710A

Start this software using the following procedure.

<Procedure>

1. Press  on the MG3710A front panel to display the common platform screen.

The common platform screen is a screen used to select each function of the IQproducer™.

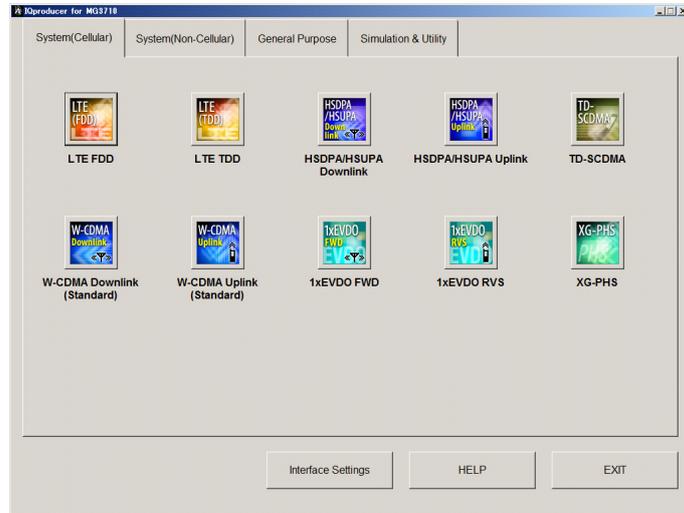


Figure 2.3.2-1 Common Platform Screen

2. Click the **System (Cellular)** tab on the common platform screen, to show the **System (Cellular)** selection screen that supports each telecommunication system.

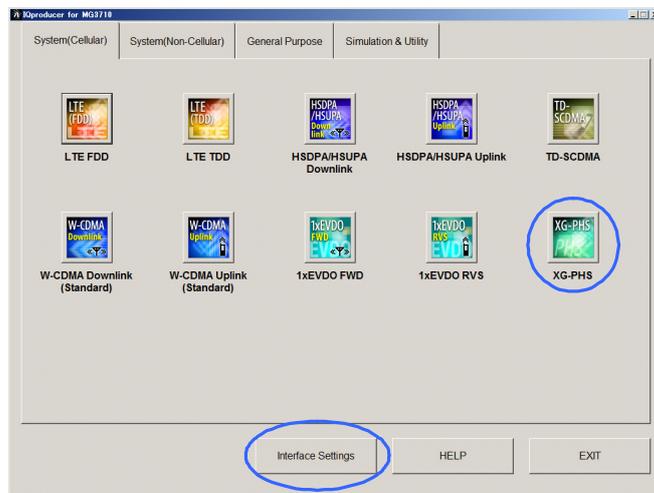


Figure 2.3.2-2 System (Cellular) Selection Screen

- Click **XG-PHS** to display the main screen. For details of the main screen, refer to Chapter 3 “Detailed Description of Functions”.

Note:

When this software is installed on MG3710A, **Change Instrument** displays instead of **Interface Settings**. Clicking **Interface Settings** displays the Interface Setting dialog box.

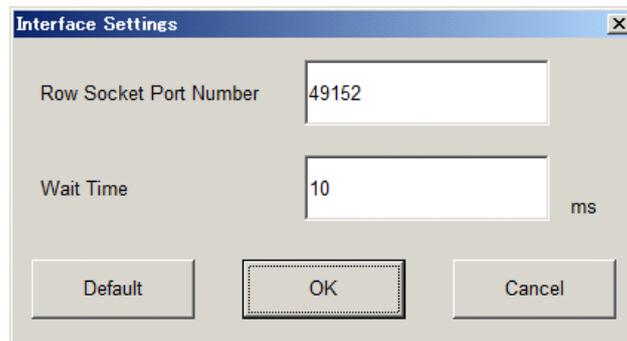


Figure 2.3.2-3 Interface Settings Dialog Box

Here, you can configure interface-related settings of IQproducer and MG3710A. To return to factory defaults, click **Default**.

- Row Socket Port Number
Sets Row Socket port number. Set the same value as that for MG3710A.
- Wait Time
Sets the wait time between commands.

2.3.3 Exiting Software

Stop this software using the following procedure.

■When exiting only this software

To exit only this software without closing the Common Platform screen, or other IQproducer™ tools, do one of these below:

- Click the Exit button () on the tool bar.
- Select Exit from the File menu.
- Click the  button on the upper right screen.

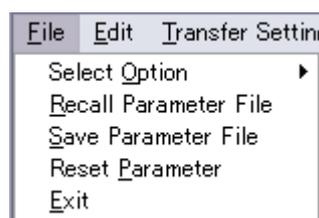


Figure 2.3.3-1 Exiting Software

The operation of the three screen buttons is explained below.



Figure 2.3.3-2 Exit Confirmation Window

- **Yes** Saves current parameters to file and stops this software.
- **No** Stops this software without saving current parameters to file.
- **Cancel** or  Cancels the process and returns to the main screen.

When stopping this software using the **Yes** button, the saved parameters are read at the next start and reset for each parameter.

■When exiting entire IQproducer™ application

To exit all tools of IQproducer™ that are running, select **Exit** on the Common Platform Screen. In this case, a dialog is displayed to confirm stopping of each running tool.

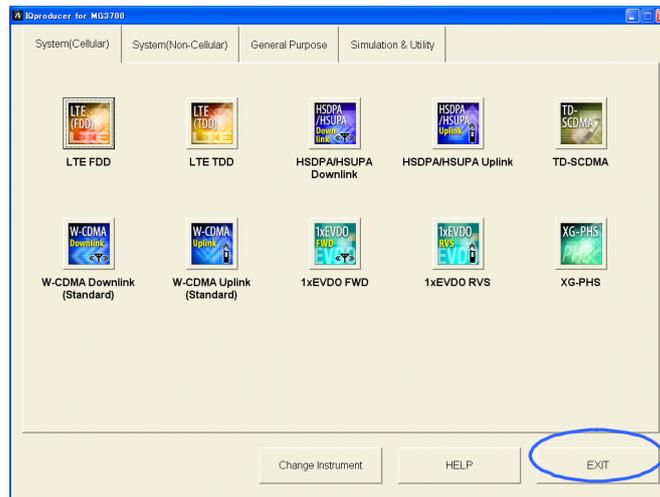


Figure 2.3.3-3 Exiting IQproducer™

Chapter 3 Detailed Description of Functions

This chapter provides detailed descriptions of this software.

Notes:

- The examples and screens used throughout this chapter are based on the assumption that the IQproducer™ is activated with the MG3700A.
- The MG3710A and MS2690A/MS2691A/MS2692A functions are described as notes in each item.

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3.1 Screen Details

3.1.1 Menu and tool button

On common platform screen, select the **System (Cellular)** tab, and then select **XG-PHS** to display the main screen.

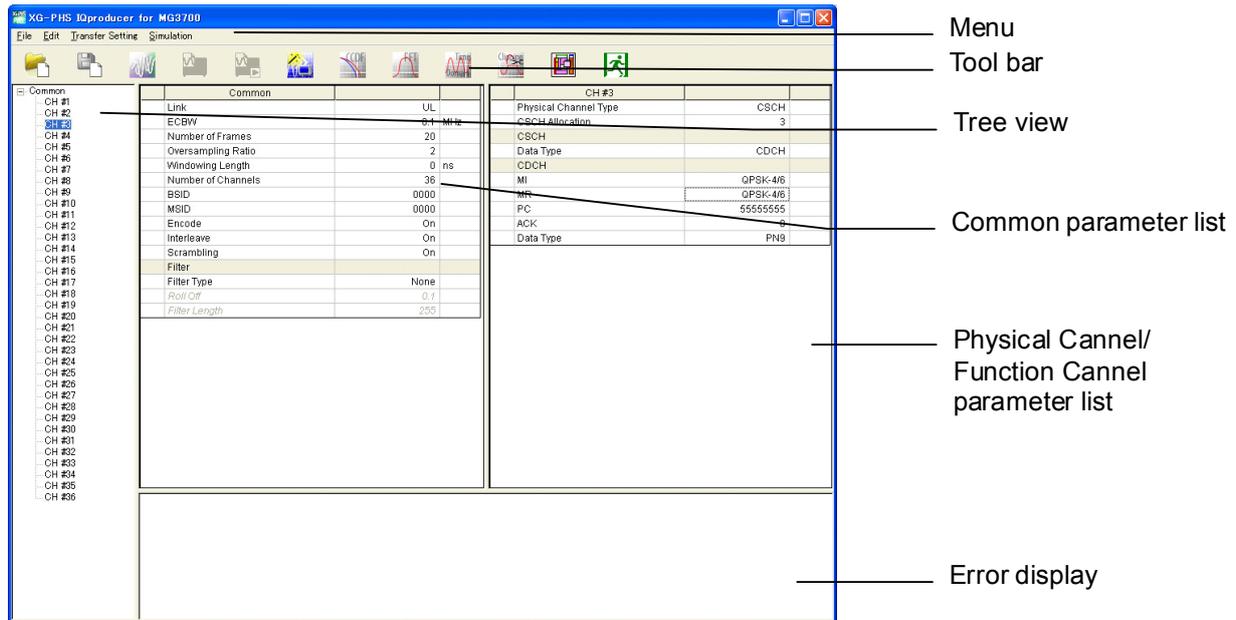


Figure 3.1.1-1 Main screen

■ Basic operations of main screen

- The window can be maximized, minimized, expanded, and reduced.
- Each field of the tree view, Common parameter list, Physical Channel parameter list, and error display can be moved by dragging to a separate position.
- The leftmost symbol of each item in the tree view is – when the integrated items are open, or + when they are closed. Clicking the mark changes the status.
- The items in italic cannot be changed. These items are set automatically. The state of each item may change depending on the setting for other items.
- The grayed out items indicate parameters not related to the generated waveforms in the current setting and cannot be changed. The state of each item may change depending on the setting for other items.

■ Screen transitions

Figure 3.1.1-2 shows transitions from the main screen that is displayed when the XG-PHS IQproducer™ is started to other screens (Export File, Calculation, and Frame Structure screens). For details about each of the screens, refer to the sections shown below the corresponding screen.

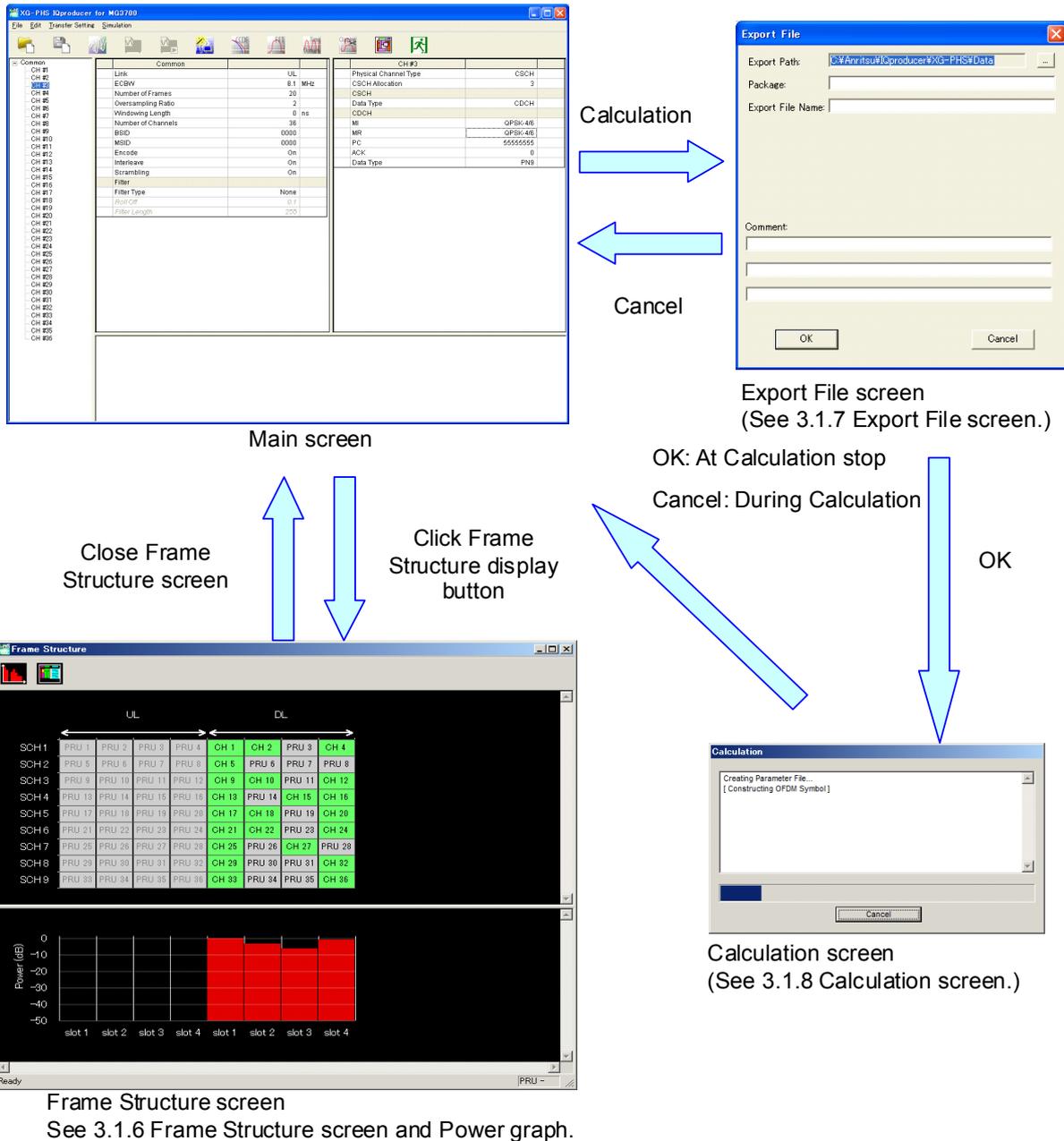


Figure 3.1.1-2 Screen transition

■ [File] menu

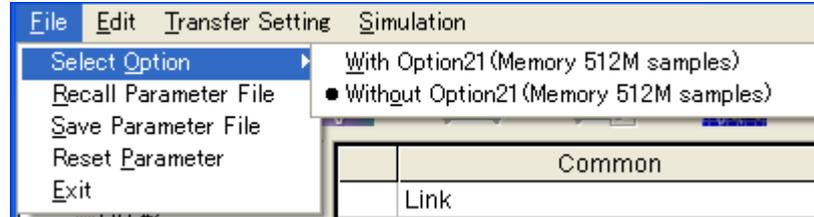


Figure 3.1.1-3 File menu

• Select Option

Notes:

- This function is available only when **MG3700**, or **MG3710** is selected in the **Select instrument** screen.
- ARB Memory Expansion (option) is not available for MS269xA. Only Memory 256M samples, 1 GB is available.

■When using MG3700A

Select whether the ARB memory expansion option 256Msamples is installed. Selecting **With Option21 (Memory 512M 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 256Msamples when **Without Option21 (Memory 512M samples)** is selected. Select either according to the presence of ARB memory expansion option.

Table 3.1.1-1 Available Options for MG3700A

Items	ARB Memory Expansion
With Option21 (Memory 512M samples)	1 GB x 2 memory
Without Option21 (Memory 512M samples):	512 MB x 2 Memories

■When using MG3710A

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.

Table 3.1.1-2 Available Options for MG3710A

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.

Table 3.1.1-3 Waveform Pattern Maximum Size

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

- Recall Parameter File
Loads the parameter files saved by the Save Parameter File menu. When the parameter file is loaded, the settings when it was loaded are recovered.
- Save Parameter File
Saves the current setting parameters to a file.
- Reset Parameter
Initialize all the parameters.
- Exit
Exits from this software.

■ [Edit] Menu



Figure 3.1.1-4 Edit menu

- Calculation
Generates waveform patterns.
- Calculation & Load
Note:
This function is available only when this software is used on MG3710A.

After waveform generation is finished, the created waveform pattern is loaded into the MG3710A waveform memory.
- Calculation & Play
Note:
This function is available only when this software is used on MG3710A.

After waveform generation is finished, the created waveform pattern is loaded and selected at the MG3710A waveform memory.
- Show Frame Structure
Starts Frame Structure screen.
- Clipping
Displays Clipping setting screen. In this screen, clipping and filtering processing can be performed for a generated waveform pattern.

- [Transfer Setting] Menu



Figure 3.1.1-5 Transfer Setting menu

- Transfer & Setting Wizard

Note:

This function is available only when **MG3700** or **MG3710** is selected in the **Select instrument** screen.

Displays the Transfer Setting Wizard screen. Every operation ranging from connecting the PC and MG3700A or MG3710A and transferring the waveform pattern to the MG3700A or MG3710A, to loading the waveform pattern into the MG3700A or MG3710A ARB memory is performed at this screen.

- [Simulation] menu



Figure 3.1.1-6 Simulation menu

- CCDF

Displays the CCDF Graph Monitor screen. In this screen, the CCDF of the generated waveform pattern is displayed in a graph.

- FFT

Displays the FFT Graph Monitor screen. In this screen, the FFT-processed spectrum of the generated waveform pattern is displayed in a graph.

- Time Domain

Displays Time Domain screen. In this screen, the time domain waveform of a generated waveform pattern is displayed in a graph.

■ Tool buttons

Notes:

- Transfer&Setting Wizard is available only when **MG3700** or **MG3710** is selected in the **Select instrument** screen.
- Calculation & Load and Calculation & Play are available only when this software is used on MG3710A.

	Recall Parameter File
	Save Parameter File
	Calculation
	Calculation & Load
	Calculation & Play
	Transfer & Setting Wizard
	CCDF
	FFT
	Time Domain
	Clipping
	Show Segment Edit
	Exit

Clicking a tool button operates the same as the corresponding commands in the menu.

3.1.2 Tree view

The tree view displays the parameter that belongs to the waveform pattern to be created as a hierarchy structure. Right-click **Common** at the tree view and select **Add Channel** to add a channel. Right-click each channel and select **Delete Channel** to delete the channel where the cursor is pointing. Channels can be added and deleted by setting **Number of Channels** in the common parameter list.

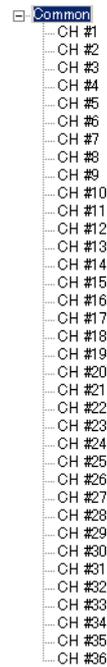


Figure 3.1.2-1 Tree view

3.1.3 List of Common Parameters

The items displayed in the common parameter list are described below. Parameters that require setting are listed in the common parameter list. The common parameters are displayed under Common.

Link

[Function] Sets signal Uplink, and Downlink.
[Default] DL
[Setting range] UL, DL
[Remarks] The Physical Channel setting for each channel remains unchanged when Link changes but related parameters are initialized.

ECBW

[Function] Sets effective channel width.
[Default] 8.1 MHz
[Setting range] 8.1 MHz, 9.0 MHz, 16.2 MHz, 17.1 MHz, 18.0 MHz
[Remarks] Channel settings are initialized when ECBW is narrowed prior to the change.

Number of Frames

[Function] Sets the number of frames to be generated.
[Default] 1
[Setting range] When Oversampling Ratio = 2
ECBW = 8.1, 9.0 MHz 1 to 2796
ECBW = 16.2, 17.1, 18.0 MHz, 1 to 1398
When Oversampling Ratio = 4
ECBW = 8.1, 9.0 MHz 1 to 1398
ECBW = 16.2, 17.1, 18.0 MHz, 1 to 699
[Resolution] 1
[Remarks] The number of frames differs whether Option 21 is installed or not. This is explained in the table below.

Table 3.1.3-1 Number of frames for MG3700A

Select Option	Oversampling Ratio	ECBW	Number of frames
With Option 21 (Memory 512Msamples)	2	8.1, 9.0 MHz	1 to 5592
		16.2, 17.1, 18.0 MHz	1 to 2796
	4	8.1, 9.0 MHz	1 to 2796
		16.2, 17.1, 18.0 MHz	1 to 1398
Without Option 21(Memory 512Msamples)	2	8.1, 9.0 MHz	1 to 2796
		16.2, 17.1, 18.0 MHz	1 to 1398
	4	8.1, 9.0 MHz	1 to 1398
		16.2, 17.1, 18.0 MHz	1 to 699

Table 3.1.3-2 Number of frames for MG3710A

Select Option	Oversampling Ratio	ECBW	Number of frames
Memory 64M samples	2	8.1, 9.0 MHz	1 to 699
		16.2, 17.1, 18.0 MHz	1 to 349
	4	8.1, 9.0 MHz	1 to 349
		16.2, 17.1, 18.0 MHz	1 to 174
Memory 64M samples x2 (With Option48, 78)	2	8.1, 9.0 MHz	1 to 1398
		16.2, 17.1, 18.0 MHz	1 to 699
	4	8.1, 9.0 MHz	1 to 699
		16.2, 17.1, 18.0 MHz	1 to 349
Memory 256M samples	2	8.1, 9.0 MHz	1 to 2796
		16.2, 17.1, 18.0 MHz	1 to 1398
	4	8.1, 9.0 MHz	1 to 1398
		16.2, 17.1, 18.0 MHz	1 to 699
Memory 256M samples x2 (With Option48, 78)	2	8.1, 9.0 MHz	1 to 5992
		16.2, 17.1, 18.0 MHz	1 to 2796
	4	8.1, 9.0 MHz	1 to 2796
		16.2, 17.1, 18.0 MHz	1 to 1398
Memory 1024M samples	2	8.1, 9.0 MHz	1 to 5992
		16.2, 17.1, 18.0 MHz	1 to 2796
	4	8.1, 9.0 MHz	1 to 5992
		16.2, 17.1, 18.0 MHz	1 to 2796
Memory 1024M samples x2 (With Option48, 78)	2	8.1, 9.0 MHz	1 to 5992
		16.2, 17.1, 18.0 MHz	1 to 2796
	4	8.1, 9.0 MHz	1 to 5992
		16.2, 17.1, 18.0 MHz	1 to 2796

Oversampling Ratio

[Function] Sets oversampling ratio.
[Default] 2
[Setting range] 2, 4

Windowing Length

[Function] Sets Windowing length.
[Default] 0 ns
[Setting range] 0 to 2000 ns

Filter Type

[Function] Sets filtering type.
[Setting range] Nyquist, Root Nyquist, Ideal, None
[Default] None
[Remarks] When Nyquist, Root Nyquist, or Ideal is selected, filtering is performed by setting frequencies within 1.1 times ECBW as the passband, and frequencies above 1.1 times ECBW as the stopband. Filtering is not performed when None is selected.

Roll Off

[Function] Sets roll-off ratio of filter.
[Setting range] 0.1 to 1.0
[Resolution] 0.1
[Default] 0.1
[Remarks] This setting is valid when Nyquist or Root Nyquist is selected for Filter Type.

Filter Length

[Function] Sets number of filter taps.
[Setting range] 1 to 1024
[Default] 255
[Remarks] This setting is valid when Nyquist or Root Nyquist is selected for Filter Type.

Number of Channels

[Function] Sets number of channels.

[Default] 1

[Setting range] ECBW = 8.1 MHz 1 to 36
 ECBW = 9.0 MHz 1 to 40
 ECBW = 16.2 MHz 1 to 72
 ECBW = 17.1 MHz 1 to 76
 ECBW = 18.0 MHz 1 to 80

[Remarks] The maximum value for Number of Channels varies with the EXCH setting.

BSID

[Function] Sets Base Station ID.

[Default] 0x0000

[Setting range] 0x0000 to 0x7FFF

MSID

[Function] Sets Mobile Station ID.

[Default] 0x0000

[Setting range] 0x0000 to 0x7FFF

Scrambling

[Function] Sets scrambling ON/OFF.

[Default] ON

[Setting range] ON, OFF

[Remarks] When ON is selected, the CRC bit is calculated by using MAC Header and MAC Frame, and then scrambling is performed for the areas of the MAC Header, MAC Frame, and CRC bit. Scrambling is not performed when OFF is selected.

Encode

[Function] Sets Encode ON/OFF.

[Default] ON

[Setting range] ON, OFF

[Remarks] When OFF is selected, data is assigned to the areas of the MAC Header, MAC Frame, CRC bit, and TAIL bit.

Interleave

[Function] Sets Interleave ON/OFF.

[Default] ON

[Setting range] ON, OFF

3.1.4 Physical Channel Parameters (DL)

This section explains each item displayed in the Physical Channel parameter list when Link is set to DL in the common parameter list.

3.1.4.1 CCCH

When CCCH is selected at Physical Channel Type, the following items are displayed in the Physical Channel parameter list.

CCCH Allocation

[Function]	Sets PRU number for allocating CCCH
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set. Allocation CCCH to one or two SCHs is permitted.

Physical Channel Data Type

[Function]	Sets data to be inserted into CRC Calculation Area.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, Function Channel

Physical Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Physical Channel Data Type.

Physical Channel User File

[Function]	Sets user file to be inserted into CRC Calculation Area.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

Function Channel Data Type

[Function]	Sets type of data to be inserted into BCCH, SCCH or PCH.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File
[Remarks]	This is displayed when Function Channel is selected for Physical Channel Data Type.

Function Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into BCCH or PCH.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into BCCH or PCH.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.4.2 ANCH

The following items are displayed in the Physical Channel parameter list when ANCH is selected at Physical Channel Type.

ANCH Allocation

[Function]	Sets PRU number for allocating ANCH.
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set.

Physical Channel Data Type

[Function]	Sets type of data used as CRC Calculation Area.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, ECCH, ICCH
[Remarks]	The CI value is set automatically when ECCH or ICCH is selected.

Physical Channel 16Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Physical Channel Data Type.

Physical Channel User File

[Function]	Sets user file to be inserted into CRC Calculation Area.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

MAP Origin

[Function]	Sets MAP start position.
[Default]	1
[Setting range]	ECBW = 8.1 MHz 0 to 8 ECBW = 9.0 MHz 0 to 9 ECBW = 16.2 MHz 0 to 17 ECBW = 17.1 MHz 0 to 18 ECBW = 18.0 MHz 0 to 19
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

MAP

[Function]	Sets MAP value.
[Setting range]	0x00000000000000000000 to 0x7FFFFFFFFFFFFFFFFFFFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. The MAP value is automatically set according to each channel allocation, and cannot be set manually.

SD

[Function]	Sets Shift Direction.
[Default]	Stay
[Setting range]	Stay, One Step Backward, Two Steps Forward, One Step Forward
[Remarks]	This is displayed when ECCH or ICCH is selected at Physical Channel Data Type.

ANCH PC

[Function]	Sets ANCH Power Control value.
[Default]	0x5555 5555
[Setting range]	0x0000 0000 to 0xFFFF FFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. One bit is set per frame, starting from upper bits.

EXCH PC

[Function]	Sets EXCH Power Control value.
[Default]	0x5555 5555
[Setting range]	0x0000 0000 to 0xFFFF FFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. Four bits are set per frame, starting from upper bits.

PC

[Function] Sets the Power Control value.
[Default] 0x5555 5555
[Setting range] 0x0000 0000 to 0xFFFF FFFF
[Remarks] This is displayed when ICCH is selected for Physical Channel Data Type. One bit is set per frame, starting from upper bits.

ACK

[Function] Sets ACK value.
[Default] 0xF FFFF FFFF
[Setting range] 0x0 0000 0000 to 0xF FFFF FFFF
[Remarks] This is displayed when ECCH is selected at Physical Channel Data Type.

V

[Function] Sets Validity value.
[Default] 0x7F
[Setting range] 0x00 to 0x7F
[Remarks] This is displayed when ECCH is selected at Physical Channel Data Type. When EXCH is set for another channel, the same value as Validity of EXCH is set and the maximum value is that of EXCH PRU Number. In this case, the number of MAC frames of EXCH is determined based on this value.

MI

[Function] Sets MI value.
[Default] QPSK-4/6
[Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks] This is displayed when ECCH is selected at Physical Channel Data Type. When EXCH is set for another channel, the same value as MCS of EXCH is set. MI cannot be set for slots to which EXCH is not assigned.

MR

[Function]	Sets MR value.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

HC

[Function]	Sets HARQ Cancel.
[Default]	0
[Setting range]	0, 1
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

Function Channel Data Type

[Function]	Sets type of data to be inserted into MAC Frame.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File
[Remarks]	This is displayed when ICCH is selected at Physical Channel Data Type.

Function Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into MAC Frame.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed only when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into MAC Frame.
[Setting range]	An arbitrary file can be selected.
[Remarks]	This is displayed only when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.4.3 EXCH

The following items are displayed in the Physical Channel parameter list when EXCH is selected at Physical Channel Type.

EXCH PRU Number

- [Function] Displays values of PRU for allocation of EXCH.
- [Default] Smallest free PRU number
- [Setting range] 1 to 80
- [Remarks] The maximum value depends on ECBW. EXCH Number is calculated based on the PRU set by EXCH Allocation.

EXCH Allocation

- [Function] Sets PRU for allocation of EXCH.
- [Default] Smallest free PRU number
- [Setting range] ECBW = 8.1 MHz 1 to 36
ECBW = 9.0 MHz 1 to 40
ECBW = 16.2 MHz 1 to 72
ECBW = 17.1 MHz 1 to 76
ECBW = 18.0 MHz 1 to 80
- [Remarks] This cannot be set when the PRU is already allocated to another channel. Click the PRU number to open the setting screen.

Physical Channel Data Type

- [Function] Sets data to be inserted into CRC Calculation Area.
- [Default] PN9
- [Setting range] PN9, PN15, PN23, 16 bit repeat, User File, EDCH

Physical Channel 16 Bit Repeat

- [Function] Sets 16-bit repeat data to be inserted into CRC Calculation Area.
- [Default] 0x0000
- [Setting range] 0x0000 to 0xFFFF
- [Resolution] 1
- [Remarks] This is displayed when 16 bit repeat is selected for Physical Channel Data Type.

Physical Channel User File

- [Function] Sets data file to be inserted into CRC Calculation Area.
 [Setting range] Any file can be selected.
 [Remarks] This is displayed when User File is selected for Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

Function Channel Data Type

- [Function] Sets type of data to be inserted into MAC Frame.
 [Default] PN9
 [Setting range] PN9, PN15, PN23, 16 bit repeat, User File
 [Remarks] This is displayed when EDCH is selected for Physical Channel Data Type.

Function Channel 16 Bit Repeat

- [Function] Sets 16 -bit repeat data to be inserted into MAC Frame.
 [Default] 0x0000
 [Setting range] 0x0000 to 0xFFFF
 [Resolution] 1
 [Remarks] This is displayed only when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

- [Function] Sets user file to be inserted into MAC Frame.
 [Setting range] Any file can be selected.
 [Remarks] This is displayed only when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

MCS

- [Function] Sets type of MCS
 [Default] QPSK-4/6
 [Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
 [Remarks] QPSK-4/6 is set for slots to which EXCH is not assigned. If Physical Channel Type and Physical Channel Data Type are set to ANCH and ECCH for another channel, respectively, the same value as MI of ANCH is set.

PRU Concatenation

[Function]	Sets PRU Concatenation
[Default]	OFF
[Setting range]	ON, OFF
[Remarks]	When PRU Concatenation is set to ON, a data symbol is assigned to all EXCH subcarriers (except the one at the center of the ECBW).

Validity

[Function]	Sets the valid PRU of EXCH.
[Default]	0
[Setting range]	0 to EXCH PRU Number
[Remarks]	If Physical Channel Type and Physical Channel Data Type are set to ANCH and ECCH for another channel, respectively, the same value as V of ANCH is set.

3.1.4.4 CSCH

The following items are displayed in the Physical Channel Parameter list when CSCH is selected at Physical Channel Type.

CSCH Allocation

[Function]	Sets PRU number for allocation of CSCH.
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set.

Physical Channel Data Type

[Function]	Sets type of data to be inserted in CRC Calculation Area.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, TCH, CDCH
[Remarks]	The CI value is set automatically when TCH or CDCH is selected.

Physical Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Physical Channel Data Type.

Physical Channel User File

[Function]	Sets data file to be inserted into CRC Calculation Area.
[Setting range]	An arbitrary file can be selected.
[Remarks]	This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

MCS

- [Function] Sets type of MCS.
- [Default] QPSK-4/6
- [Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
- [Remarks] This is displayed when a channel other than TCH or CDCH is selected for Physical Channel Data Type.

MI

- [Function] Sets MI value.
- [Default] QPSK-4/6
- [Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
- [Remarks] This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

MR

- [Function] Sets MR value.
- [Default] QPSK-4/6
- [Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
- [Remarks] This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

SD

- [Function] Sets Shift Direction.
- [Default] Stay
- [Setting range] Stay, One Step Backward, Two Steps Forward, One Step Forward
- [Remarks] This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

PC

- [Function] Sets Power Control value.
- [Default] 0x5555 5555
- [Setting range] 0x0000 0000 to 0xFFFF FFFF
- [Remarks] This is displayed when TCH or CDCH is selected at Physical Channel Data Type. One bit is set per frame, starting from upper bits.

ACK

[Function]	Sets ACK value.
[Default]	0
[Setting range]	0, 1
[Remarks]	This is displayed when CDCH is selected at Physical Channel Data Type.

Function Channel Data Type

[Function]	Sets type of data to be inserted into Mac Frame.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File
[Remarks]	When TCH is selected for Physical Channel Data Type, select one data type for ACCH and TCH.

Function Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into MAC frame.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into MAC Frame.
[Setting range]	An arbitrary file can be selected.
[Remarks]	This is displayed when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.5 Physical Channel Parameters (UL)

This section explains each of the items that are displayed in the Physical Channel parameter list when Link in the common parameter list is set to UL.

3.1.5.1 CCCH

CCCH Allocation

[Function] Sets PRU number for allocation of CCCH.
[Default] Smallest free PRU number
[Setting range] 1 to 80
[Remarks] The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set. Allocation CCCH to one or two SCH is permitted.

Physical Channel Data Type

[Function] Sets data to be inserted into Control Field.
[Default] PN9
[Setting range] PN9, PN15, PN23, 16 bit repeat, User File, Function Channel

Physical Channel 16 Bit Repeat

[Function] Sets 16-bit repeat data to be inserted into Control Field.
[Default] 0x0000
[Setting range] 0x0000 to 0xFFFF
[Resolution] 1
[Remarks] This is displayed when 16 bit repeat is selected at Physical Channel Data Type.

Physical Channel User File

[Function] Sets user file to be inserted into Control Field.
[Setting range] An arbitrary file can be selected.
[Remarks] This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B "User File Format" for details on the user file format.

Function Channel Data Type

[Function]	Sets type of data to be inserted into BCCH, SCCH or PCH.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File
[Remarks]	This is displayed when Function Channel is selected for Physical Channel Data Type.

Function Channel 16 Bit Repeat

[Function]	Sets the 16-bit repeat data to be inserted into BCCH or PCH.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into BCCH or PCH.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.5.2 ANCH

The following items are displayed in the Physical Channel parameter list when ANCH is selected at Physical Channel Type.

ANCH Allocation

[Function]	Sets PRU number for allocation of ANCH
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set.

Physical Channel Data Type

[Function]	Sets type of data.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, ECCH, ICCH
[Remarks]	The CI value is set automatically when ECCH or ICCH is selected.

Physical Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.

Physical Channel User File

[Function]	Sets user file to be inserted into CRC Calculation Area.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

RCH

[Function]	Sets RCH value.
[Default]	0x00
[Setting range]	0x00 to 0x7F
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. The RCH value includes reserved bits.

ANCH PC

[Function]	Sets ANCH Power Control value.
[Default]	0x5555 5555
[Setting range]	0x0000 0000 to 0xFFFF FFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. One bit is set per frame, starting from upper bits.

EXCH PC

[Function]	Sets EXCH Power Control value.
[Default]	0x5555 5555
[Setting range]	0x0000 0000 to 0xFFFF FFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

ACK

[Function]	Sets ACK value.
[Default]	0xF FFFF FFFF
[Setting range]	0x0 0000 0000 to 0xF FFFF FFFF
[Remarks]	This is displayed when ECCH is selected at Function Channel Data Type.

V

[Function]	Sets Validity value.
[Default]	0x7F
[Setting range]	0x0 0000 to 0xF FFFF
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. When EXCH is set for another channel, the same value as Validity of EXCH is set and the maximum value varies according to the EXCH PRU Number. In this case, the number of MAC frames of EXCH is determined based on this value.

MI

[Function]	Sets MI value.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type. When EXCH is set for another channel, the same value as MCS of EXCH is set. In this case, the MI value is fixed to QPSK4/6 for slots to which EXCH is not assigned.

MR

[Function]	Sets MR value.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

HC

[Function]	Sets HARQ Cancel value.
[Default]	0
[Setting range]	0, 1
[Remarks]	This is displayed when ECCH is selected at Physical Channel Data Type.

Function Channel Data Type

[Function]	Sets type of data to be inserted into MAC Frame (ICCH).
[Default]	PN9
[Setting range]	PN9, PN15, 16 bit repeat, User File
[Remarks]	This is displayed when ICCH is selected for Physical Channel Data Type.

Function Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into MAC Frame (ICCH).
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected for Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into MAC Frame (ICCH).
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected for Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.5.3 EXCH

The following items are displayed in the Physical Channel parameter list when EXCH is selected at Physical Channel Type.

EXCH PRU Number

[Function]	Displays value of PRU for allocation of EXCH.
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The maximum value depends on ECBW. EXCH Number is calculated based on the PRU set by EXCH Allocation.

PRU Allocation

[Function]	Sets PRU number for allocation of EXCH.
[Default]	Smallest free PRU number
[Setting range]	ECBW = 8.1 MHz 1 to 36 ECBW = 9.0 MHz 1 to 40 ECBW = 16.2 MHz 1 to 72 ECBW = 17.1 MHz 1 to 76 ECBW = 18.0 MHz 1 to 80
[Remarks]	This cannot be set when the PRU is already allocated to another channel.

Physical Channel Data Type

[Function]	Sets data type.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, EDCH

Physical Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is selected for Physical Channel Data Type.

Physical Channel User File

[Function]	Sets user file to be inserted into CRC Calculation Area.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected for Physical Channel Data Type. Refer to Appendix B "User File Format" for details on the user file format.

Function Channel Data Type

- [Function] Sets type of data to be inserted into Control Field.
- [Default] PN9
- [Setting range] PN9, PN15, 16 bit repeat, User File

Function Channel 16 Bit Repeat

- [Function] Sets 16-bit repeat data to be inserted into Control Field.
- [Default] 0x0000
- [Setting range] 0x0000 to 0xFFFF
- [Resolution] 1
- [Remarks] This is displayed only when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

- [Function] Sets user file to be inserted into Control Field.
- [Setting range] Any file can be selected.
- [Remarks] This is displayed only when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

MCS

- [Function] Sets type of MCS
- [Default] QPSK-4/6
- [Setting range] BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
- [Remarks] If Physical Channel Type and Physical Channel Data Type are set to ANCH and ECCH for another channel, respectively, the same value as MI of ANCH is set. The MCS value is fixed to QPSK-4/6 for slots to which EXCH is not assigned.

Validity	
[Function]	Sets the valid PRU for EXCH.
[Default]	Number of EXCH PRUs for each slot
[Setting range]	0 to the number of EXCH PRUs for each slot
[Remarks]	If Physical Channel Type and Physical Channel Data Type are set to ANCH and ECCH for another channel, respectively, this value is set to V of ANCH. Double-click the set value to open the Validity setting screen, and then set the valid number of EXCHs for each slot.

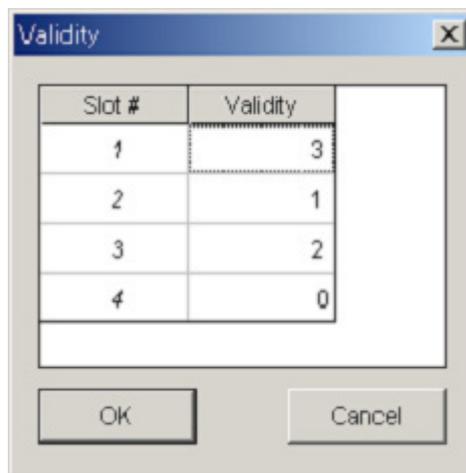


Figure 3.1.5.3-1 Validity setting screen

3.1.5.4 CSCH

The following items are displayed in the Physical Channel Parameter list when CSCH is selected at Physical Channel Type.

CSCH Allocation

[Function]	Sets PRU number for allocation of CSCH.
[Default]	Smallest free PRU number
[Setting range]	1 to 80
[Remarks]	The setting range varies with the ECBW setting. A PRU that has already been allocated to another channel cannot be set.

Physical Channel Data Type

[Function]	Sets data to be inserted in CRC Calculation Area.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File, TCH, CDCH
[Remarks]	The CI value is set automatically when TCH or CDCH is selected.

Physical Channel 16 Bit Repeat

[Function]	Sets 16-bit repeat data to be inserted into CRC Calculation Area.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed when 16 bit repeat is set at Physical Channel Data Type.

Physical Channel User File

[Function]	Sets user file to be inserted into CRC Calculation Area.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed when User File is selected at Physical Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

MCS

[Function]	Sets type of MCS.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when a channel other than TCH or CDCH is selected for Physical Channel Data Type.

MI

[Function]	Sets MI value.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

MR

[Function]	Sets MR value.
[Default]	QPSK-4/6
[Setting range]	BPSK-1, BPSK-3/4, QPSK-1, QPSK-4/6, 16QAM-1, 16QAM-4/6, 64QAM-3/4, 64QAM-6/10, 256QAM-4/6, 256QAM-8/14
[Remarks]	This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

PC

[Function]	Sets Power Control value.
[Default]	0x5555 5555
[Setting range]	0x0000 0000 to 0xFFFF FFFF
[Remarks]	This is displayed when TCH or CDCH is selected at Physical Channel Data Type.

ACK

[Function]	Sets ACK value.
[Default]	0
[Setting range]	0, 1
[Remarks]	This is displayed when CDCH is selected at Physical Channel Data Type.

Function Channel Data Type

[Function]	Sets type of data to be inserted into MAC Frame.
[Default]	PN9
[Setting range]	PN9, PN15, PN23, 16 bit repeat, User File

Function Channel 16Bit Repeat Data

[Function]	Sets 16-bit repeat data to be inserted into MAC Frame.
[Default]	0x0000
[Setting range]	0x0000 to 0xFFFF
[Resolution]	1
[Remarks]	This is displayed only when 16 bit repeat is selected at Function Channel Data Type.

Function Channel User File

[Function]	Sets user file to be inserted into MAC Frame.
[Setting range]	Any file can be selected.
[Remarks]	This is displayed only when User File is selected at Function Channel Data Type. Refer to Appendix B “User File Format” for details on the user file format.

3.1.6 Frame Structure screen and power graph

The Frame Structure screen opens when Show Frame Structure is selected at the **Edit** menu of the Main screen or when  on the Toolbar is clicked. The Frame Structure screen indicates which Physical Channel is allocated each PRU. Each channel is displayed in a different color.

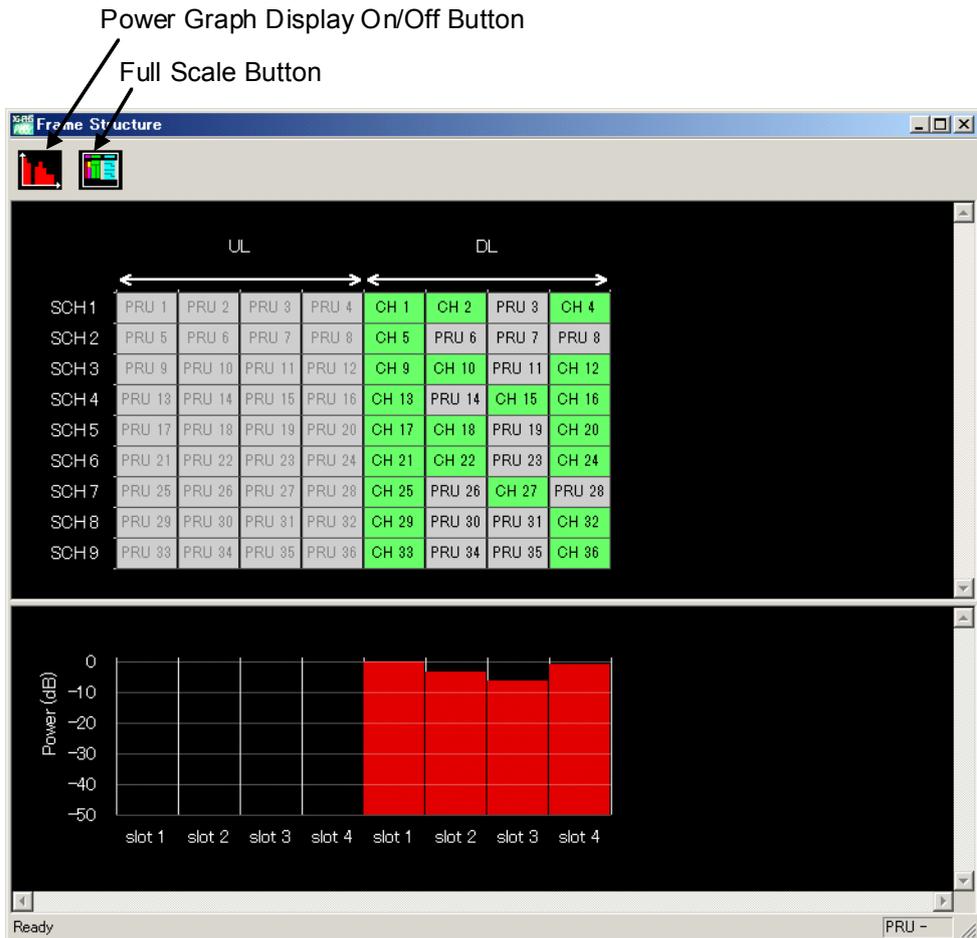


Figure 3.1.6-1 Frame Structure screen and power graph

3.1.6.1 Frame Structure screen

The Frame Structure screen displays frequency on the vertical axis and time in Slot units on the horizontal axis.

3.1.6.2 Power graph

The power graph can be displayed and hidden by clicking the show/hide button at the top left corner of the Frame Structure screen. The vertical axis indicates power as a ratio to the slot with the maximum power expressed as 0 dB. The horizontal axis indicates the match with the Slot time axis.

The power graph shows using the power of Training Symbol (0 dB) as a reference, whose slot has the greatest number of allocated channels.

This Training Symbols becomes the Amplitude defined by the mainframe.

3.1.7 Export File screen

When Calculation is selected from the **Edit** menu or the  tool button is clicked on the main screen, the Export File screen shown in Figure 3.1.7-1 is displayed.

The **Export File** screen is displayed when generating a waveform pattern. The output destination folder, package name, file name, and comment for the waveform pattern to be generated can be specified in this screen.

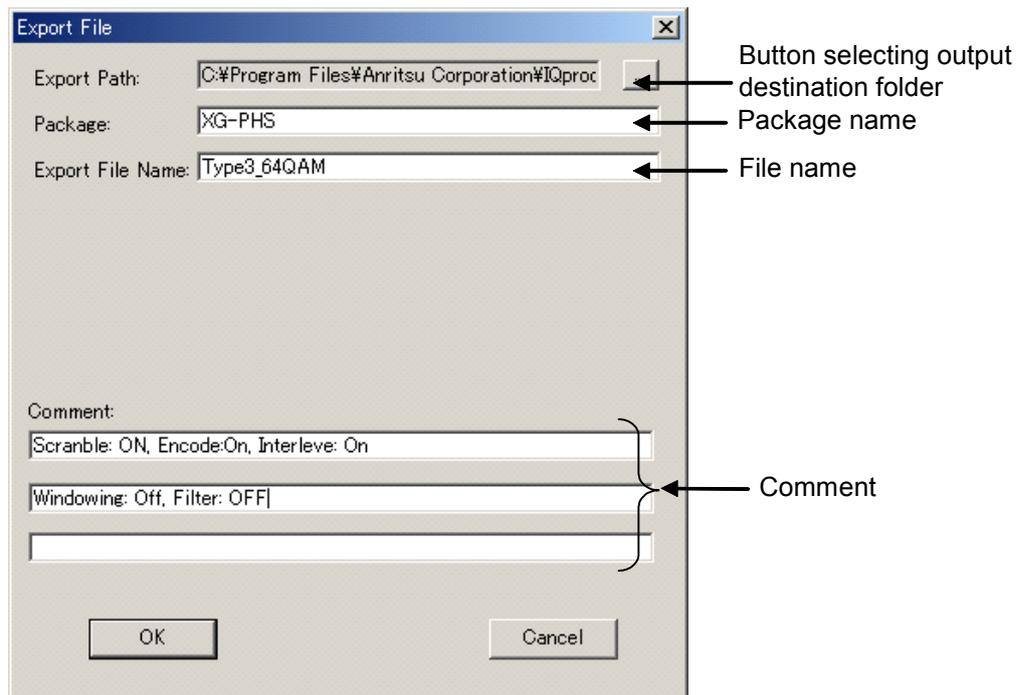


Figure 3.1.7-1 Export File screen

Only 1-byte alphanumeric characters and the following symbols can be used for a file name and package name.

! % & () + = ` { } _ - ^ @ []

When the waveform pattern output destination folder, package name, file name, and comment are set, click OK on the Export File screen. The Calculation screen shown in Figure 3.1.8-1 is displayed and waveform pattern generation starts (the output destination folder, package name, and file name must be set to start waveform pattern generation).

When started with MS269x and when **MS269x** is selected in the **Select instrument** screen, waveform pattern files generated by this application are saved in the following directory:

Installed OS	Export destination folder
Windows Embedded Standard 7	C:\Anritsu\Signal Analyzer\System\Waveform
Other than above	C:\Program Files\Anritsu Corporation\Signal Analyzer\System\Waveform

When used with MG3710A, the files are saved in the following directory:
C:\Anritsu\MG3710A\User Data\Waveform

In other cases, the output destination folder selection button is clicked, the folder selection screen shown in Figure 3.1.7-2 is displayed. Select the output destination folder. If it is not specified, the generated waveform patterns are output to the path X:\IQproducer\XG-PHS\Data (X:\IQproducer indicates the folder where the IQproducer™ is installed.)

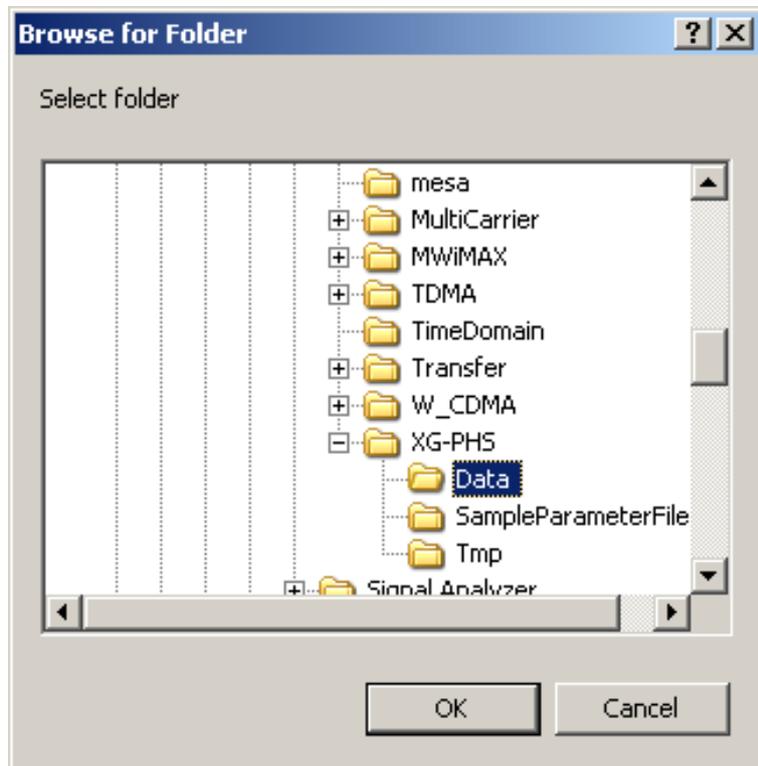


Figure 3.1.7-2 Folder selection screen

3.1.8 Calculation screen

Clicking **Calculation & Load**, **Calculation & Play**, or the **OK** button on the Export File screen will start the waveform generation.

The Calculation screen is displayed while a waveform pattern is being generated. On this screen, the progress bar is displayed indicating the generation process of the waveform pattern and the progress of the waveform pattern generation. The generation of the waveform pattern can be stopped by clicking the Cancel button. When cancelled, it returns to the main screen.

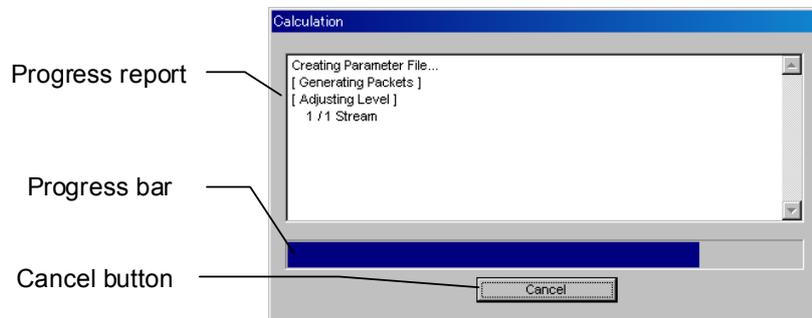


Figure 3.1.8-1 Calculation Screen (In Progress)

After waveform pattern generation is finished, the message “Calculation Completed.” is displayed in the progress window and the **Cancel** button changes to the **OK** button.

When the generation is complete, you can return to the setting screen by clicking the **OK** button. After waveform generation, two files with .wvi and .wvd extension are output.

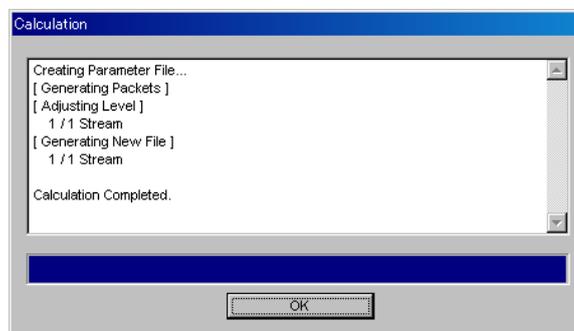


Figure 3.1.8-2 Calculation Screen (Completed)

Note:

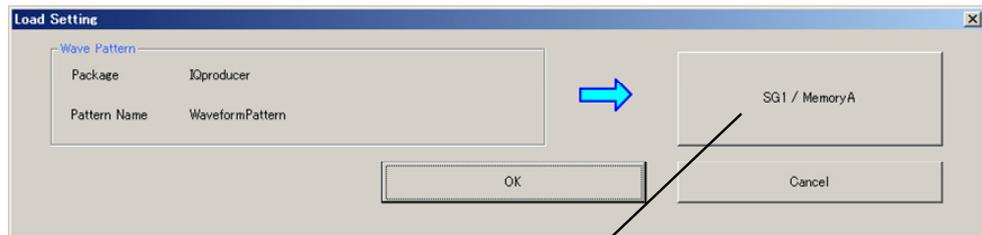
When using this software on MG3710A, and selecting **Calculation & Load** or **Calculation & Play**, the waveform generation ends without displaying the above screen.

3.1.9 Calculation & Load

Note:

This function is available only when this software is used on MG3710A.

When **Calculation & Load** is selected, the Load Setting screen will display after waveform generation.



Button for selecting load destination

Figure 3.1.9-1 Load Setting Screen

The Select Memory screen will display after clicking the load destination in the Load Setting screen.

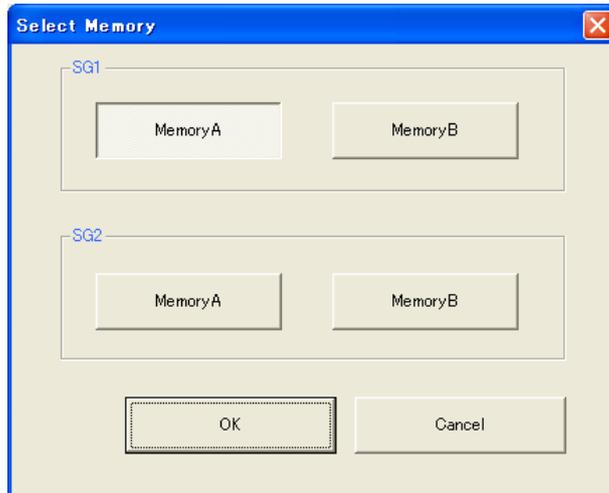


Figure 3.1.9-2 Select Memory Screen

After selecting the load destination of generated waveform in the Select Memory screen and clicking the **OK** button, the Load Setting screen will be shown again. Click the **OK** button in the Load Setting screen, and then the loading of waveform starts.

Note:

To exit this screen without loading the waveform pattern, click the **Cancel** button in the Load Setting screen.

3.1.10 Calculation & Play

Note:

This function is available only when this software is used on MG3710A.

When **Calculation & Play** is selected, after waveform creation is completed, the created waveform is loaded into memory, selected and output.

When the 2nd Vector Signal Generator (option) is installed, the Select SG screen is displayed before the start of waveform generation. This screen is used to select the signal generator for outputting the created waveform pattern.



Figure 3.1.10-1 Select SG Screen

3.2 Waveform Pattern Generation Procedure

3.2.1 Setting parameters and creating waveform pattern

This section describes the waveform pattern generation procedure, using the XG-PHS waveform pattern for which the parameters are set as shown in Table 3.2.1-1 as an example.

Table 3.2.1-1 Settings for common parameters

Parameter	Settings
Link	DL
ECBW	8.1 MHz
Number of Frames	20
Oversampling Ratio	2
Windowing Length	0
Filter Type	None
Number of Channels	4
BSID	0x0000
MSID	0x7FFF
Encode	ON
Scramble	ON
Interleave	ON

Procedure

[Creating Downlink waveform]

A Downlink waveform is created here as an example.

1. Start this software.
2. Set the common parameters as shown in Table 3.2.1-1.
3. Click **CH#1** of the tree view and set the CCCH parameters as shown in Table 3.2.1-2.

Table 3.2.1-2 CCCH Settings

Parameter	Settings
Physical Channel Type	CCCH
CCCH Allocation	1
Data Type	Function Channel
Function CH Data Type	PN9

4. Click **CH#2** of the tree view and set the ANCH parameters as shown in Table 3.2.1-3.

Table 3.2.1-3 ANCH Settings

Parameter	Settings
Physical Cannel Type	ANCH
ANCH Allocation	6
Data Type	ECCH
MAP Origin	1
SD	Stay
ANCH_PC	0x5555 5555
EXCH_PC	0xAAAA AAAA
ACK	0xF FFFF FFFF
V	0x7F
Slot #1 MI	QPSK-4/6
Slot #2 MI	16QAM-4/6
Slot #3 MI	64QAM-6/10
Slot #4 MI	256QAM-8/14
Slot #1 MR	64QAM-3/4
Slot #2 MR	16QAM-1
Slot #3 MR	QPSK-1
Slot #4 MR	BPSK-1
HC	1

- Click CH#3 of the tree view and set the CSCH parameters as shown in Table 3.2.1-4.

Table 3.2.1-4 CSCH Settings

Parameter	Settings
Physical Cannel Type	CSCH
CSCH Allocation	7
Data Type	CDCH
MI	16QAM-4/6
MR	64QAM-3/4
SD	Stay
PC	0x5555 5555
ACK	0
Data Type	PN23

- Click CH#4 of the tree view and set the EXCH parameters as shown in Table 3.2.1-5.

Table 3.2.1-5 CSCH Settings

Parameter	Settings
Physical Cannel Type	EXCH
EXCH Allocation #1	PRU = 9
EXCH Allocation #2	PRU = 13
EXCH Allocation #3	PRU = 17
EXCH Allocation #4	PRU = 21
Slot #1 MCS	64QAM-3/4
Validity	2
PRU Concatenation	ON
Data Type	PN23

7. Click the **Show Frame Structure** button to confirm the channel allocation for each PRU. Close the Frame Structure screen after completing the confirmation.
8. Click **Calculation**. While the Export File screen is displayed, input the Package name as **XG-PHS**, and the File name as **DL_Type3_Test001**.
9. Click the **OK** button to start calculation while the Calculation screen is displayed. Click the **OK** button after calculation is completed to finish waveform creation.
10. The DL_Type3_Test001.wvi, and DL_Type3_Test001.wvd files are output to the path X:\IQproducer\XG-PHS\Data installed by this software (X:\IQproducer indicates the folder installed by IQproducer™).

3.2.2 EXCH

This section explains EXCH channel coding.

If an even number of EXCH PRUs in a slot are set to be valid, every CRC Unit for that slot becomes 2PRU. If an odd number of EXCH PRUs in a slot are set to be valid, the last CRC Unit in that slot becomes 1PRU, but the other CRC Units become 2PRU.

For example, if four EXCH PRUs in a slot are set to be valid, every two PRUs make up 1 CRC Unit, resulting in two CRC Units being created in this slot.

In addition, if five EXCH PRUs in a slot are set to be valid, the last PRU makes up 1 CRC Unit and every two of the other PRUs make up 1 CRC Unit from the beginning.

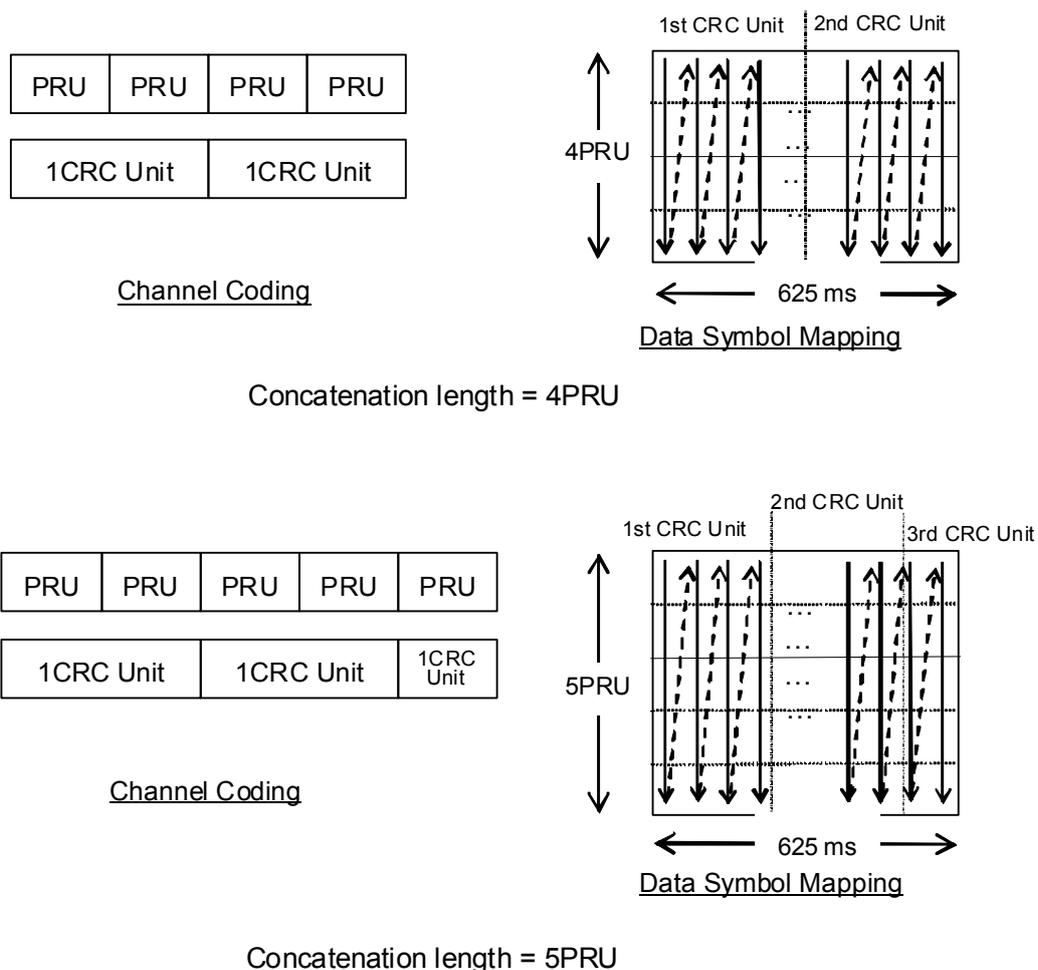


Figure 3.2.2-1 Example of PRU Concatenation

3.3 Saving/Recalling Parameters

The numeric values and settings for each item can be saved in a parameter file by using this software.

3.3.1 Saving parameter file

When running on PC or MS2690A/MS2691A/MS2692A

1. Select **Save Parameter File** from the **File** menu or click the  tool button to display the parameter file saving screen.

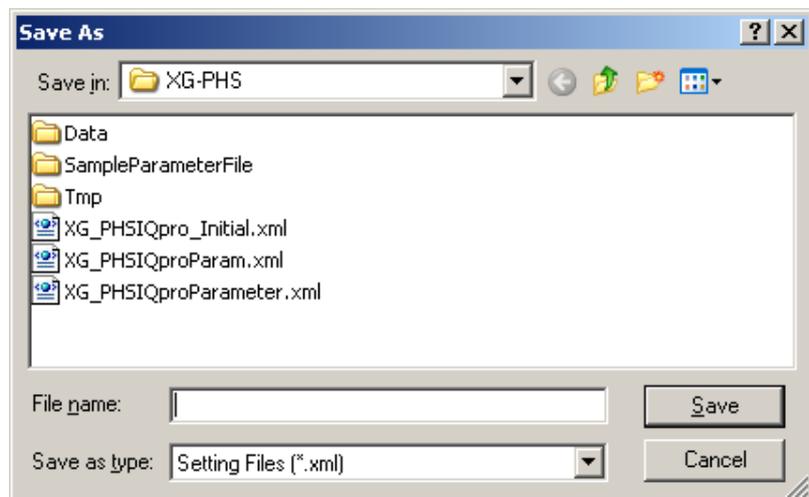


Figure 3.3.1-1 Parameter file saving screen

2. Specify **Save in**, input a file name in the **File name** text box, and click **Save** to save the parameter file.

When running on MG3710A

1. Click the **Save Parameter File** button in **File** menu or click the  button to display the parameter file saving screen.

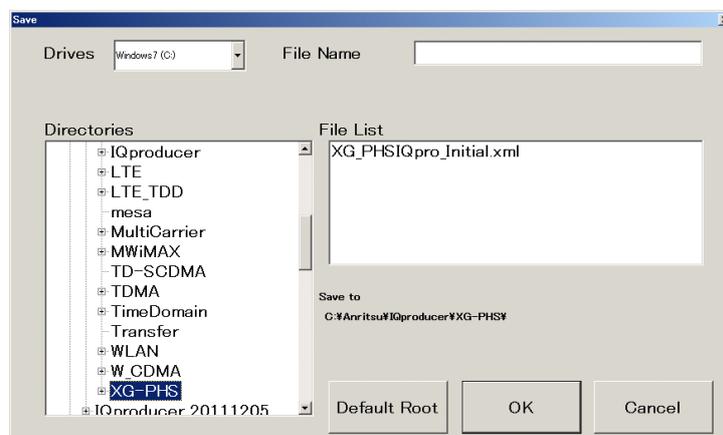


Figure 3.3.1-2 Parameter file saving screen (MG3710A)

2. Select the folder to store the file in the **Directories** field, and then enter the name of the file using the **File Name** box. Click **OK** to save the parameter file. To initialize the setting in the **Directories** field, click the **Default Root** button.

3.3.2 Recalling parameter file

When running on PC or MS2690A/MS2691A/MS2692A

1. Select **Recall Parameter File** from the **File** menu or click the  tool button to display the parameter file recalling screen.

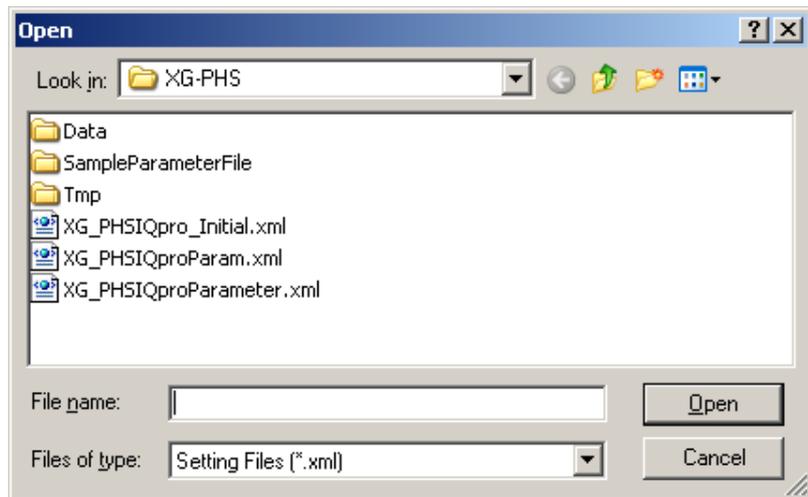


Figure 3.3.2-1 Parameter file recalling screen

2. Select the parameter file to be read from the file list, and click **Open** to recall the selected parameter file.

When running on MG3710A

1. Select **Recall Parameter File** from the **File** menu or click the  tool button to display the parameter file reading screen.

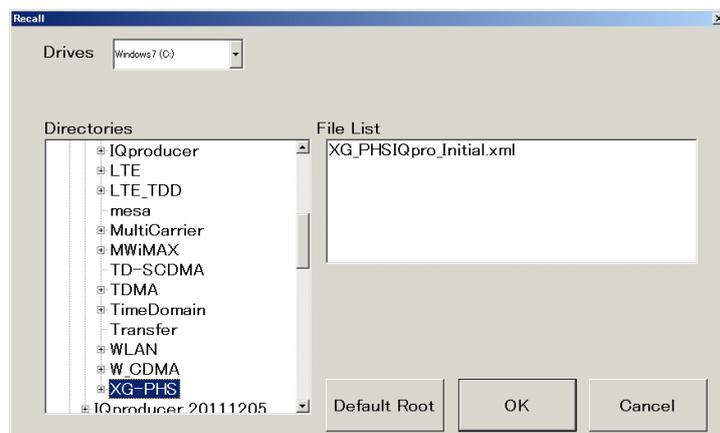


Figure 3.3.2-2 Parameter file recalling screen (MG3710A)

2. Select the directory where the files to be loaded is stored in the **Directories** field. Click the desired file from the **File List**, and click **OK**. To initialize the setting in the **Directories** field, click the **Default Root** button.

3.4 User File Reading Screen

When running on PC or MS2690A/MS2691A/MS2692A

1. When **User File** is selected in each layer, the user file reading screen is displayed.

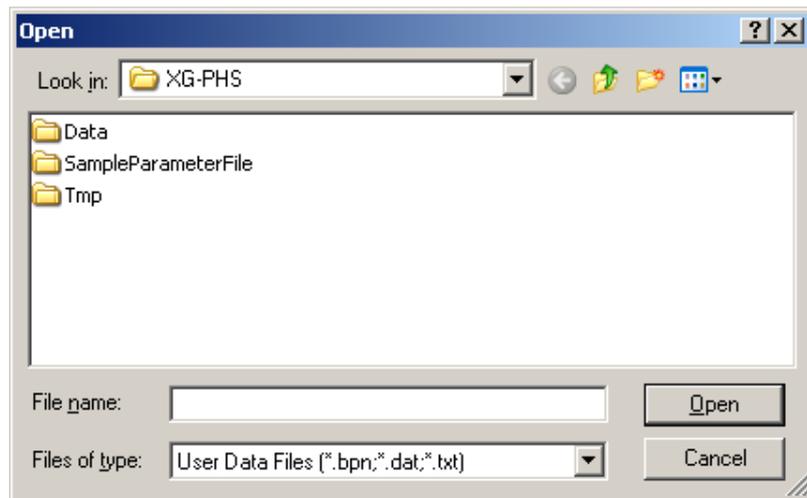


Figure 3.4-1 User File Reading Screen

2. Select the user file to be read from the file list, and then click **Open** to read the selected user file.

If an unsupported User File is selected, an error is displayed. Refer to Appendix B “User File Format” for details on the user file format.

When running on MG3710A

1. When **User File** is selected for **Data Type** setting in the Channel Setting screen, the user file reading screen is displayed.

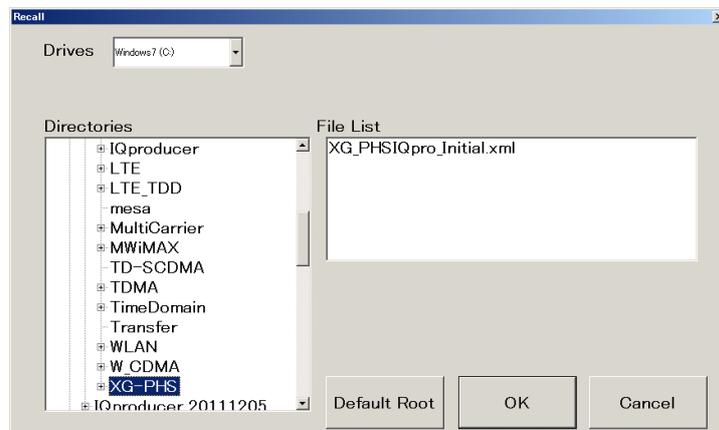


Figure 3.4-2 User File Reading Screen (MG3710A)

2. Select the directory where the user files to be loaded is stored in the **Directories** field. Click the desired file from the **File List**, and click

OK. To initialize the setting in the **Directories** field, click the **Default Root** button.

If an unsupported User File is selected, an error is displayed. Refer to Appendix B “User File Format” for details on the user file format.

3.5 Displaying Graphs

The generated waveform pattern can be displayed in a CCDF, FFT, and Time Domain graph by using this software. For details of each graph display, refer to each one of the following:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
4.3 “CCDF Graph Display”, 4.4 “FFT Graph Display”, 4.13 “Time Domain Graph Display”
- MS2690A/MS2691A/MS2692A or MS2830A Vector Signal Generator Operation Manual (IQproducer™)
4.3 “CCDF Graph Display”, 4.4 “FFT Graph Display”, 4.9 “Time Domain Graph Display”

Displaying CCDF graph

1. Generate a waveform pattern menu by executing **Calculation**.
2. Select **CCDF** from the **Simulation** menu or click the  tool button. The CCDF Graph Monitor screen is displayed with the trace of the generated waveform pattern.

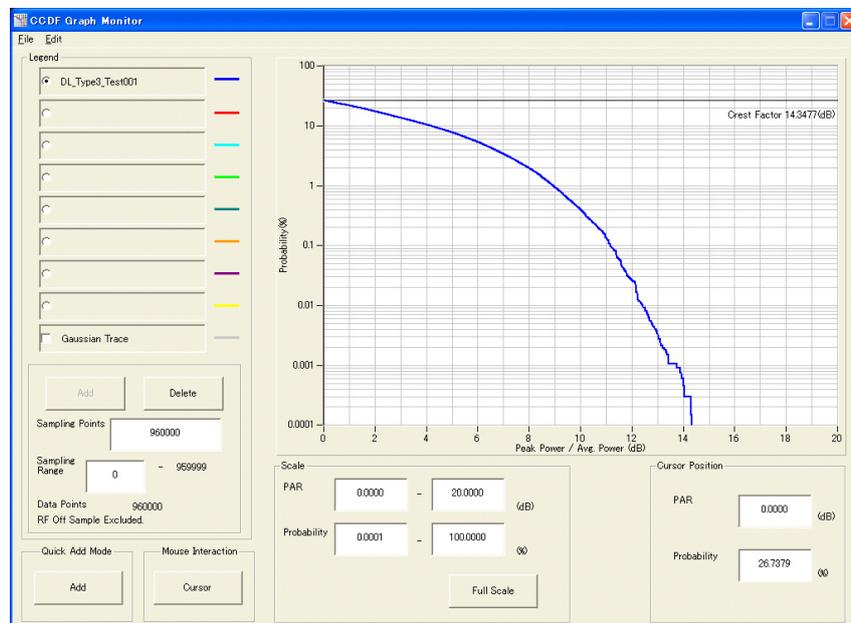


Figure 3.5-1 CCDF Graph Monitor screen

When a waveform pattern is generated by changing parameters and executing **Calculation** while other traces are displayed in the CCDF Graph Monitor screen, the trace of the newly generated waveform pattern can be displayed by either of the following two methods:

- Displaying new trace in same screen as previous traces
- Deleting previous traces to display new trace

Note:

CCDF, FFT, and Time Domain graphs cannot be created simultaneously. To display all these graphs, complete creation of each graph and then create a separate graph.

■ Displaying new trace in same screen as previous traces

1. Set **Add** for **Quick Add Mode** on the lower-left of the CCDF Graph Monitor screen.
2. Select CCDF from the **Simulation** menu or click the  tool button. The trace of the newly generated waveform pattern is additionally displayed in the CCDF Graph Monitor screen. Up to four traces can be displayed by repeating this procedure.

■ Deleting previous traces to display new trace:

1. Set **Clear** for **Quick Add Mode** on the lower-left of the CCDF Graph Monitor screen.
2. Select **CCDF** from the **Simulation** menu or click the  tool button. The confirmation dialog shown in Figure 3.5-2 below is displayed:



Figure 3.5-2 Confirmation dialog

Click the **Yes** button. The previous traces are deleted, and the trace of the newly generated waveform pattern is displayed.

Displaying FFT graph

1. Generate a waveform pattern by executing **Calculation**.
2. Select **FFT** from the **Simulation** menu or click the  tool button. The FFT Graph Monitor screen is displayed with the trace of the generated waveform pattern.

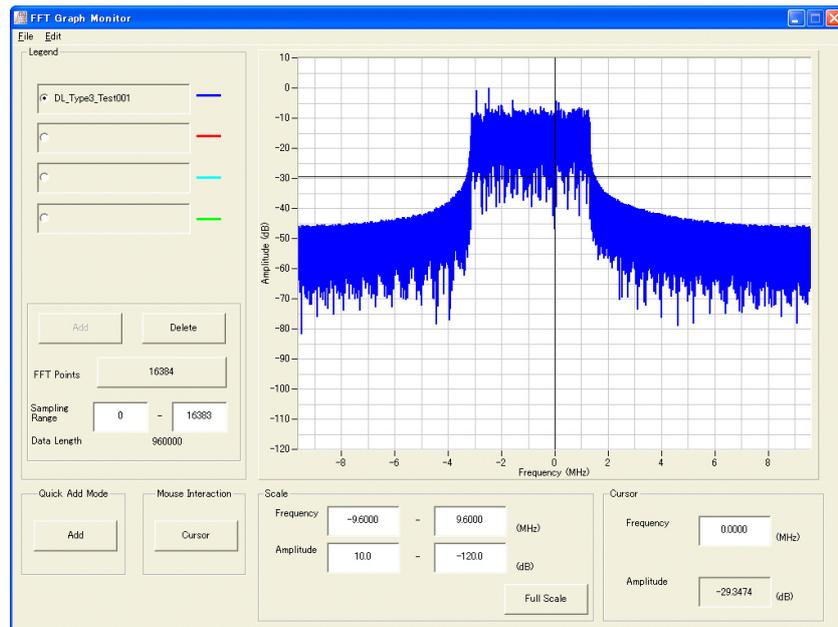


Figure 3.5-3 FFT Graph Monitor screen

When a waveform pattern is generated by changing parameters and executing Calculation while other traces are displayed in the FFT Graph Monitor screen, the trace of the newly generated waveform pattern can be displayed by either of the following two methods:

- Displaying new trace in same screen as previous traces
- Deleting previous traces to display new trace

Note:

CCDF, FFT, and Time Domain graphs cannot be created simultaneously. To display all these graphs, complete creation of each graph and then create a separate graph.

- Displaying new trace in same screen as previous traces
 1. Set **Add** for **Quick Add Mode** on the lower-left of the FFT Graph Monitor screen.
 2. Select **FFT** from the **Simulation** menu or click the  tool button. The trace of the newly generated waveform pattern is additionally displayed in the FFT Graph Monitor screen. Up to four traces can be displayed by repeating this procedure.

- When deleting previous traces to display new trace:
 1. Set **Clear** for **Quick Add Mode** on the lower-left of the FFT Graph Monitor screen.
 2. Select **FFT** from the **Simulation** menu or click the  tool button. The confirmation dialog shown in Figure 3.5-4 below appears:



Figure 3.5-4 Confirmation dialog

Click the **Yes** button. The previous traces are deleted, and the trace of the newly generated waveform pattern is displayed.

Displaying Time Domain graph

1. Generate a waveform pattern by executing **Calculation**.
2. Select **Time Domain** from the **Simulation** menu or click the  tool button. The Time Domain Graph Monitor screen shown in Figure 3.5-5 is displayed with the trace of the generated waveform pattern.

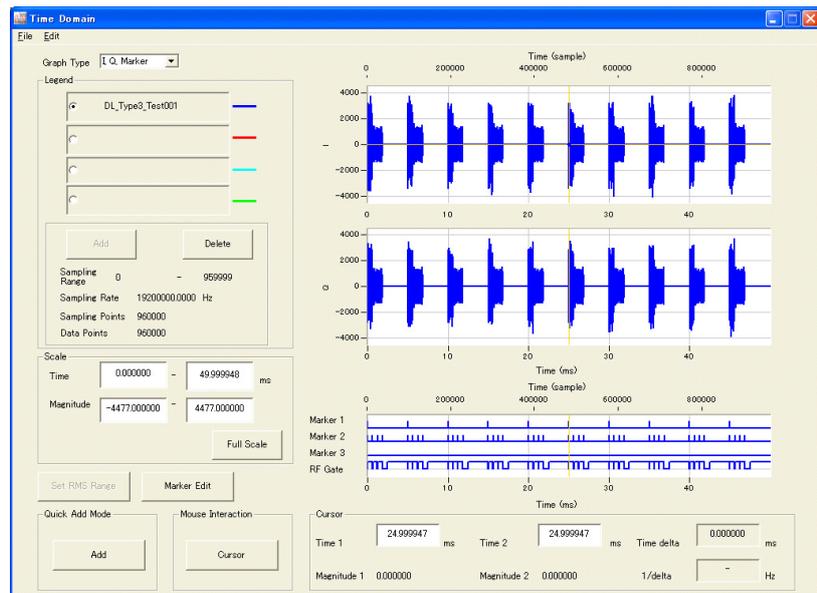


Figure 3.5-5 Time Domain screen

When a waveform pattern is generated by changing parameters and executing Calculation while other traces are displayed in the Time Domain Graph Monitor screen, the trace of the waveform pattern newly generated can be displayed by either of the following two methods:

- Displaying new trace in same screen as previous traces
- Deleting previous traces to display new trace

Note:

CCDF, FFT, and Time Domain graphs cannot be created simultaneously. To display all these graphs, complete creation of each graph and then create a separate graph.

- Displaying new trace in same screen as previous traces
 1. Set **Add** for **Quick Add Mode** on the lower-left of the Time Domain Graph Monitor screen.
 2. Select **Time Domain** from the **Simulation** menu or click the  tool button. The trace of the newly generated waveform pattern is additionally displayed in the Time Domain Graph Monitor screen. Up to four traces can be displayed by repeating this procedure.

- Deleting previous traces to display new trace:
 1. Set **Clear** for **Quick Add Mode** on the lower-left of the Time Domain Graph Monitor screen.
 2. Select **Time Domain** from the **Simulation** menu or click the  tool button. The confirmation dialog shown in Figure 3.5-6 below appears:



Figure 3.5-6 Confirmation dialog

Click the **Yes** button. The previous traces are deleted, and the trace of the newly generated waveform pattern is displayed.

3.6 Auxiliary Signal Output

When selecting waveform patterns created using XG-PHS IQproducer™ at the MS2690A/MS2691A/MS2692A, a marker that is synchronized to an RF signal can be output from the AUX Input/output connectors on the back panel as an auxiliary signal.

For details of Marker Edit function, refer to each one of the following:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
4.13.12 “Marker edit function”
- MS2690A/MS2691A/MS2692A or MS2830A Vector Signal Generator Operation Manual (IQproducer™)
4.9.12 “Marker edit function”

3.6.1 Downlink, Uplink

When creating waveform patterns, markers can be set automatically in the waveform pattern as shown below.

- Frame Pulse
A pulse that is synchronized with the beginning of the frame is output from Connector 1. Change Polarity for Marker 1 to change the signal polarity.
- Slot Pulse
A pulse that is synchronized with the beginning of the slot is output from Connector 2. Change Polarity for Marker 2 to change the signal polarity.

A waveform pattern with edited markers can be created using the Marker Edit function for Time Domain graphs.

For the error range of the auxiliary signals against the RF output, refer to each one of the following:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
4.5.6 “Input file format”
- MS2690A/MS2691A/MS2692A or MS2830A Vector Signal Generator Operation Manual (IQproducer™)
4.5.6 “Input file format”

Chapter 4 *How to Use Waveform Patterns*

The following operations are required to output a modulated signal from this equipment using the waveform pattern generated by this software:

- Transferring waveform pattern to internal hard disk
- Loading waveform patterns from the hard disk to the waveform memory
- Selecting a waveform pattern to be output from this equipment

This chapter explains the details of these operations.

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4.1 For MG3700A or MG3710A

This section describes how to download a waveform pattern created for the MG3700A/MG3710A to the hard disk of the MG3700A/MG3710A and output the pattern.

4.1.1 Transferring waveform pattern to internal hard disk

The waveform pattern created with this software can be transferred to the internal hard disk in the following ways:

Note:

This operation is not necessary if you are using MG3710A and have generated waveform patterns on MG3710A.

For MG3700A

- LAN
- CompactFlash Card

For MG3710A

- LAN
- External device such as USB Memory

■ Transferring from PC via LAN (MG3700A, MG3710A)

Two IQproducer™ tools can be used to transfer a waveform pattern to the MG3700A/MG3710A via a LAN.

- Transfer & Setting Wizard

Start this wizard by clicking the **Transfer & Setting Wizard** button of this software or by selecting **Simulation & Utility** tab → **Transfer & Setting Wizard** from the IQproducer™ after creating a waveform pattern. For details, refer to Section 4.7 “File Transfer and Loading to Memory Using Transfer & Setting Wizard” in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

Transferring a waveform pattern to the internal hard disk of the MG3700A/MG3710A, loading the waveform from the hard disk to the waveform memory, and then outputting the waveform pattern can be done using this wizard.

- Transfer & Setting Panel

This function is loaded by selecting **Transfer & Setting Panel** in the **Simulation & Utility** tab of the IQproducer™. For details, refer to Section 5.2 “Transferring Waveform Pattern” in the *MG3700A/MG3710A MG3740A Analog Signal Generator Operation Manual IQproducer™*.

Specify the folder that contains the waveform pattern to transfer to the MG3700A/MG3710A in the PC-side tree of **Transfer & Setting Panel**.

- Transferring using a CF card (MG3700A)

Copy the waveform pattern (***.wvi and ***.wvd files) to be downloaded to the MG3700A to the root directory of a CF card.

Insert the CF card into the card slot on the front panel of the MG3700A, and then copy the file to the hard disk. For details about how to use a CF card to transfer a waveform pattern, refer to (1) Loading waveform file in memory in Section 3.5.2 of the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*.

- Transferring via external device such as USB memory (MG3710A)

For details about how to transfer a waveform pattern created using this software to the hard disk of the MG3710A, refer to Section 7.3.6 “Copying external waveform pattern: Copy” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*.

4.1.2 Loading to Waveform Memory

To output a modulated signal using a waveform pattern, it is necessary to load the waveform pattern that was transferred to the internal hard disk of the MG3700A/MG3710A (described in Section 4.1.1 “Transferring waveform pattern to internal hard disk”) to the waveform memory. A waveform pattern can be loaded into the waveform memory in the following two ways.

■Configuring using the mainframe

A waveform pattern can be loaded into the waveform memory by using the instruction panel of the MG3700A/MG3710A or by using a remote command.

For operation using the front panel, refer below:

- Section 3.5.2 (1) “Loading waveform file in memory” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.4 “Loading waveform pattern: Load” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

For operation using remote commands, refer below:

- Chapter 4 “Remote Control” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.4 “Loading waveform pattern: Load” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

■Using Transfer & Setting Panel of IQproducer™

A waveform pattern can be loaded from the LAN-connected PC to the memory by using **Transfer & Setting Panel**, which can be opened from the **Simulation & Utility** tab. For details, refer to Section 4.6 “File Transfer and Loading to Memory Using Transfer & Setting Panel” in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

4.1.3 Selecting Waveform Pattern

Select a waveform pattern to use for modulation from the waveform patterns loaded into the waveform memory of the MG3700A/MG3710A according to Section 4.1.2 “Loading to waveform memory”. A waveform pattern can be selected in the following two ways.

■Configuring using the MG3700A/MG3710A

Waveform patterns to be used for modulation can be selected by operating the equipment panel or by using a remote command.

For operation using the front panel, refer below:

- Section 3.5.2 (4) “Outputting pattern loaded in Memory A for modulation in Edit mode” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.5 “Selecting output waveform pattern: Select” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

For operation using remote commands, refer below:

- Chapter 4 “Remote Control” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.5 “Selecting output waveform pattern: Select” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

■Using Transfer & Setting Panel of IQproducer™

A waveform pattern can be loaded from the LAN-connected PC to the memory, and also selected for modulation. This is done by using **Transfer & Setting Panel**, which can be opened from the **Simulation & Utility** tab. For details, refer to Section 4.6 “File Transfer and Loading to Memory Using Transfer & Setting Panel” in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

4.2 For MS2690A/MS2691A/MS2692A

This section describes how to download a waveform pattern created for the MS2690A/MS2691A/MS2692A to the hard disk of the MS2690A/MS2691A/MS2692A and output the pattern.

4.2.1 Transferring waveform pattern to internal hard disk

For details about how to transfer a waveform pattern created using this software to the hard disk of the MS2690A/MS2691A/MS2692A, refer below:

- Section 2.4.4 “Copying waveform file(s) to hard disk” in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*

Note:

Transferring waveform patterns is not required if the patterns are created using this software.

4.2.2 Loading to Waveform Memory

In order to output a modulated signal using the waveform pattern, it is necessary to load the waveform patterns stored in the internal hard disk to the waveform memory.

■ Loading to Waveform Memory

Waveform patterns can be loaded to waveform memories by operating the panel or by using a remote command.

For operation using the front panel, refer below:

- Section 2.4.1 “Loading waveform file in memory” in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*

For operation using remote commands, refer below:

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Remote Control)

4.2.3 Selecting Waveform Pattern

Select waveform patterns to be used for modulation from those loaded in the waveform memory as described in Section 4.2.1 “Transferring waveform pattern to internal hard disk” above.

■ Selecting waveform pattern

Waveform patterns to be used for modulation can be selected by operating the equipment panel or by using a remote command.

For operation using the front panel, refer below:

- Section 2.4.2 “Loading waveform file in memory” in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*

For operation using remote commands, refer below:

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Remote Control)

Appendix A Error Messages

A list of error messages is shown below. In this list, x, n₁, and n₂ indicate a numeric value, and s indicates a character string.

Table A-1 Error messages

Error Message	Description
Available memory is low.	–
Cannot open file	–
Cannot read file	–
Cannot read file("s")	–
Cannot write file	–
Cannot write file("s").	–
Input Export File Name.	–
Input Package Name.	–
Invalid file format	–
The Setting value is out of range. ("s = x(n ₁ – n ₂)")	The value of x set in parameter s is out of the setting range between n ₁ and n ₂ .
CCCH should be allocated to one or two fixed SCH.	–
Selection of an inaccurate file.("")	–
The PRU "s" is allocated already.	–
Disk full Cannot generate new waveform pattern.	–
Folder or media not found. Aborted with error.	–
The Waveform data file is not generated.	No waveform pattern. Create a waveform pattern to be displayed.

A list of warning message is shown below.

Table A-2 Warning message

Error Message	Description
Clipping was done.	–

Appendix B User File Format

This section shows examples of the user file format that can be used in the this software. A user file must be a text file. It is not necessarily required to specify an extension to user files. Note that an error occurs if a user file that does not conform to the format is read.

Be sure to write an unmodulated binary sequence into a user file. An error occurs if a user file that contains a numeric value other than 0 or 1, a character, or a symbol other than a comma or period is read.

All line feeds, commas, periods, and spaces in a user file are ignored when the user file is read.

A user file format example is shown below.

User file format example

```
111111110000011110111110001011100110010000010010100111011010001
111001111100110110001010100100011100011011010101110001001100010
00100000000100001000110000100111001010101100001101111010011011
10010001010000101011010011111011001001001011011111100100110101
001100110000000110001100101000110100101111111010001011000111010
110010110011110001111101110100000110101101101110110000010110101
111101010101000000101001010111100101110111000000111001110100100
111101011101010001001000011001110000101111011011001101000011101
1110000
```

0s and 1s in a user file are sequentially read from the leftmost of the first line.

When the number of data to be processed is larger than that in the user file, the data is set to 0s. If the user file contains more data than that to be processed, data reading terminates halfway.

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