

# MX370109A

XG-PHS IQproducer™

MG3700A  
Vector Signal Generator

For MG3700A Vector Signal Generator

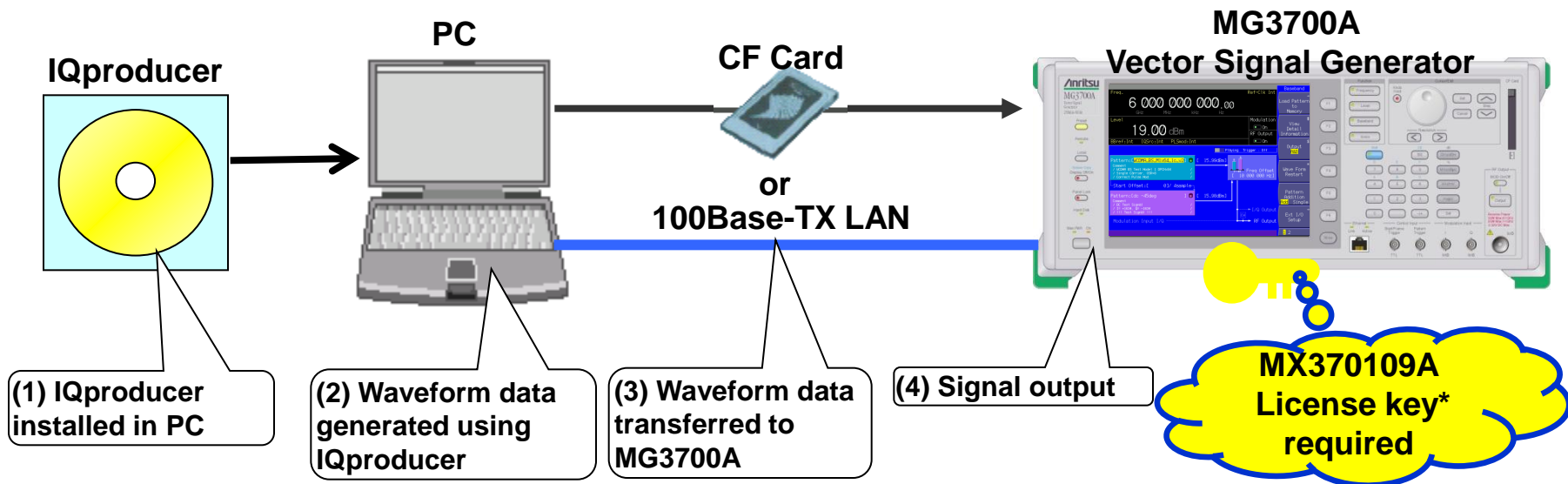
# MX370109A XG-PHS IQproducer™ Product Introduction (Version 2.00)



**Anritsu Corporation**

# What is XG-PHS IQproducer?

The MX370109A XG-PHS IQproducer™ is GUI-driven PC application software for generating waveform patterns in compliance with the next generation PHS (XGP: eXtended Global Platform ) standards. The generated waveform patterns are downloaded to the MG3700A Vector Signal Generator to output signals.



\*A shipped MG3700A requires installation of the license key file but this does not require return to the Anritsu factory.

◆ **Generating waveform patterns using MX370109A => The main frame requires a license.**

The unlicensed software will run on the PC to test waveform pattern generation but an unlicensed MG3700A cannot output signals because it does not recognize the waveform patterns.

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

# XG-PHS IQproducer Features

- **Support latest XGP standard (version 1.3)**
- **Convenient Frame Structure screen for allocating channels and checking Slot Power**
- **Versatile displays**
  - CCDF
  - Spectrum
  - Time Domain
- **Easy and convenient Clipping and Filtering functions**

# MG3700A Vector Signal Generator Feature

## Waveform combine function

### <Standard>

The MG3700A can output two signals from one unit by setting wanted and interference signals in each of two built-in arbitrary waveform memories.

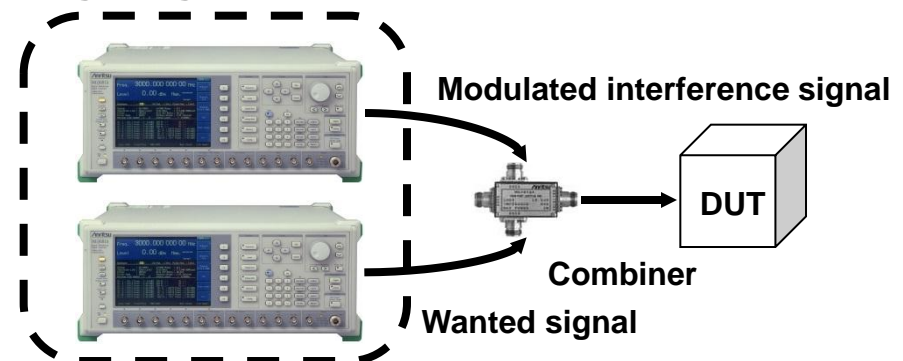
### MG3700A Setting Screen Sample

The screenshot shows the MG3700A configuration interface. Key settings include:

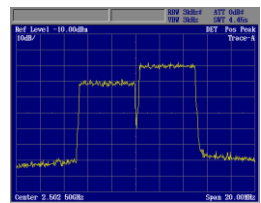
- Easy level ratio setting:** A callout box pointing to the 'C/N' (Carrier-to-Noise) setting, which is currently set to  $-63.00$  dB. It also points to the 'Level' setting, which is  $0.00$  dBm.
- Memory A: Wanted signal:** A callout box pointing to the 'File Select' field, which is set to 'WCDMA\_BS\_ACS'.
- Memory B: Interference signal:** A callout box pointing to the 'Start Offset' field, which is set to  $0.00$  Hz.
- Frequency offset setting:** A callout box pointing to the 'Freq Offset' field, which is set to  $5\ 000\ 000$  Hz.

Other visible settings include 'Output C&N', 'Waveform Restart', and 'C/N Set Constant'.

◆ Present system: Case with popular signal generator



◆ MG3700A  
MG3700A  
Vector Signal Generator



- ◆ One MG3700A unit outputs two signals
- ◆ No external combiner
- ◆ Easy level adjustment

# XG-PHS IQproducer Image

**Setup**

**Starting IQproducer**

**Editing Parameters**

**Generating Waveform**

**Transferring Waveform Pattern**

**Waveform Display Function**

**Waveform Edit Function**

**Saving/Recalling Parameters**

**Slide 6**

**Slide 7**

**Slides 8-9**

**Slide 10**

**Slides 11-12**

**Slide 13**

**Slide 14**

**Slide 15**

# Setup

- (1) Install IQproducer in the PC.
- (2) Install the MX370109A license key in the MG3700A
- (3) Connect the PC and MG3700A using a crossover cable.



## **IQproducer Operating Environment**

CPU	1 GHz or faster Pentium III
Memory	More than 512 Mb
HDD	More than 5 GB
Display	Better than 1024 × 768 pixels
OS	Windows2000 Professional, Windows XP

\*Read the appended [IQproducer Upgrade Procedure] for the IQproducer installation method.

\*Read the appended [LAN Connection] for the LAN connection method between the PC and MG3700A.

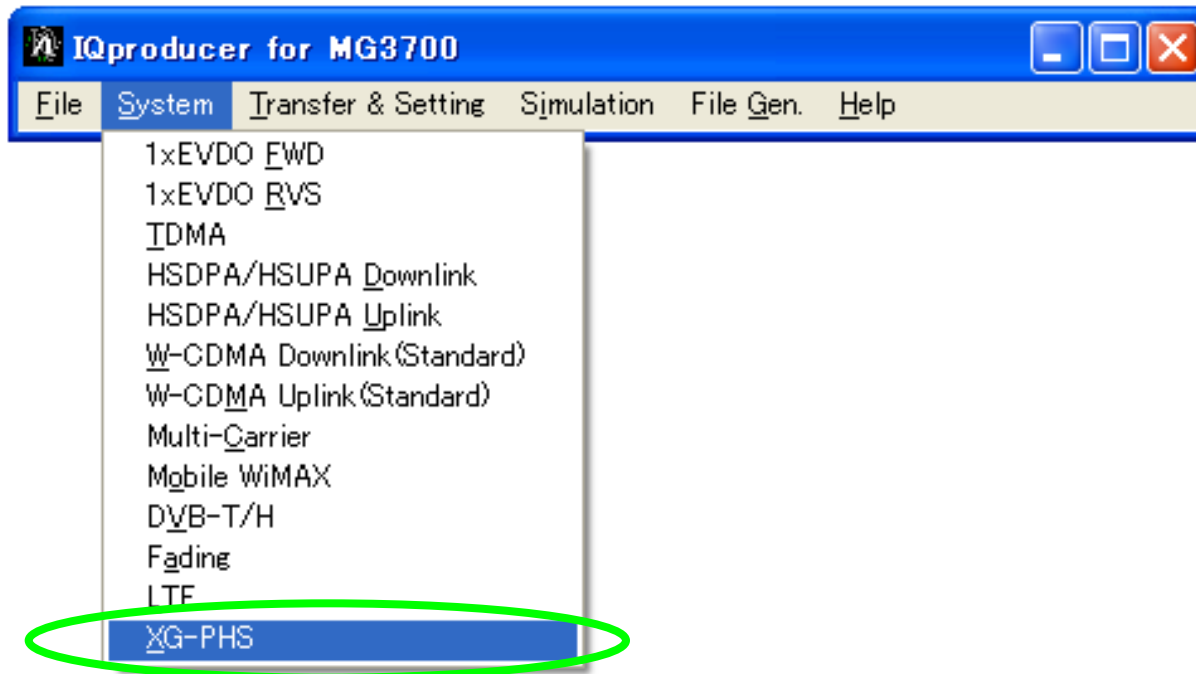
# Starting IQproducer

Start IQproducer.

Start > Programs > Anritsu Corporation > IQproducer for MG3700A

## IQproducer Main Screen

When IQproducer starts, the following screen is displayed.  
Choose XG-PHS from the [System] pull-down menu.





# Editing Parameters: Main Screen

When XG-PHS is selected at [System], the following Main screen is displayed.

## XG-PHS IQproducer Main Screen

The screenshot shows the XG-PHS IQproducer for MG3700 interface. The window title is "XG-PHS IQproducer for MG3700". The menu bar includes "File", "Edit", "Transfer Setting", and "Simulation". The toolbar contains icons for file operations and simulation. The main area is divided into three sections:

- Left Panel:** A tree view showing a hierarchy of channels from "Common" to "CH #10". "CH #10" is selected and highlighted in blue.
- Center Panel:** A table of "Common" parameters for the selected channel.
- Right Panel:** A table of parameters for "CH #10".

Callouts provide the following information:

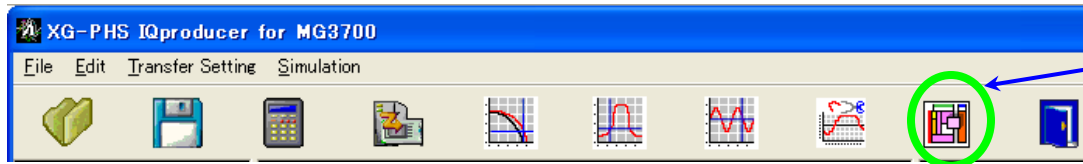
- Sets setttable CH as tree.** (Note: "setttable" is misspelled in the original image)
- Sets Common Parameters.**
- Sets CH parameters selected at tree on left.**
- Displays errors, etc.**

Common		
Link		DL
ECBW	8.1	MHz
Number of Frames	1	
Oversampling Ratio	2	
Windowing Length	0	ns
Number of Channels	10	
BSID	0000	
MSID	0000	
Encode		On
Interleave		On
Scrambling		On
Filter		
Filter Type		None
Roll Off	0.1	
Filter Length	255	

CH #10	
Physical Channel Type	CSCH
CSCH Allocation	10
CSCH	
Data Type	PN9
MCS	QPSK-4/6

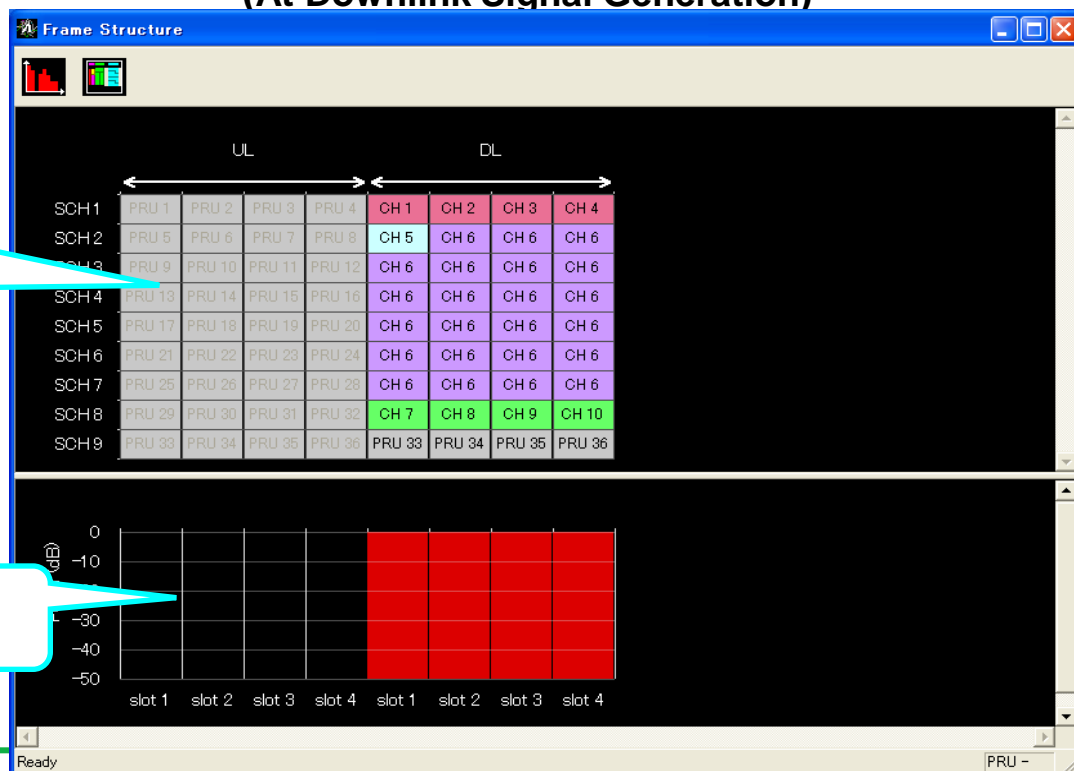
# Editing Parameters: Channel

Click the [Frame Structure] icon to open the Frame Structure screen. It is useful for checking the channel allocation status and power of each slot.



Frame Structure

Frame Structure Screen and Power Graph  
(At Downlink Signal Generation)



Displays frame configurations by vertical axis: frequency, horizontal axis: Time by slot

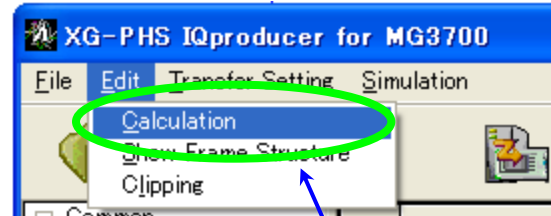
Displays relative level of each slot, setting max. power slot as 0 dB

# Generating Waveform: Calculation

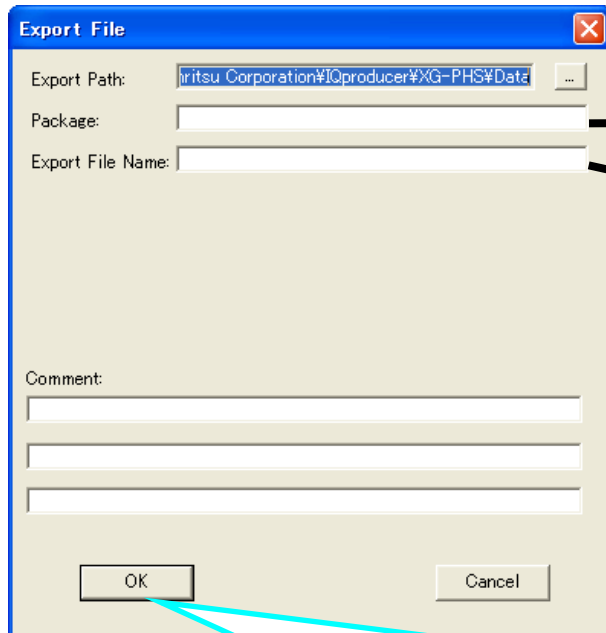
Waveform patterns are generated by clicking the [Calculation] icon.



Calculation: Creates waveform pattern



Calculation: Creates waveform pattern



Name of waveform pattern package: 31 characters max.

File name of waveform pattern: 20 characters max.

Comment on screen: 38 characters max. per line

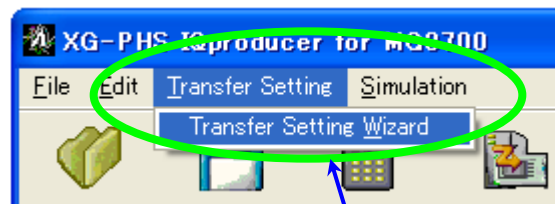
Generate the waveform pattern by clicking the [OK] button.

# Transferring Waveform Pattern (1/2)

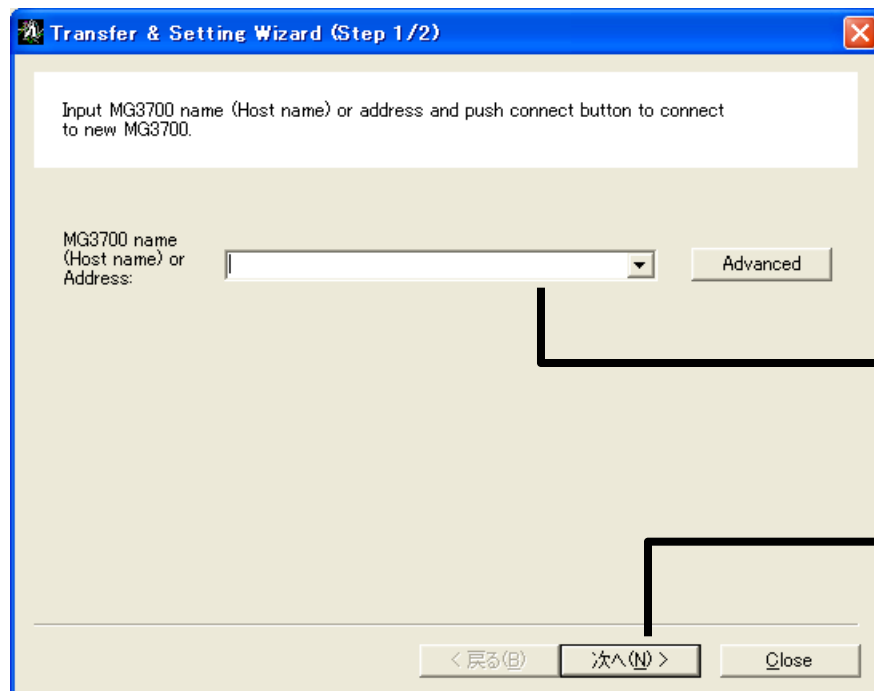
Connect the MG3700A and PC via a LAN.



Transfer & Setting: Transfers waveform pattern



Transfer & Setting: Transfers waveform pattern

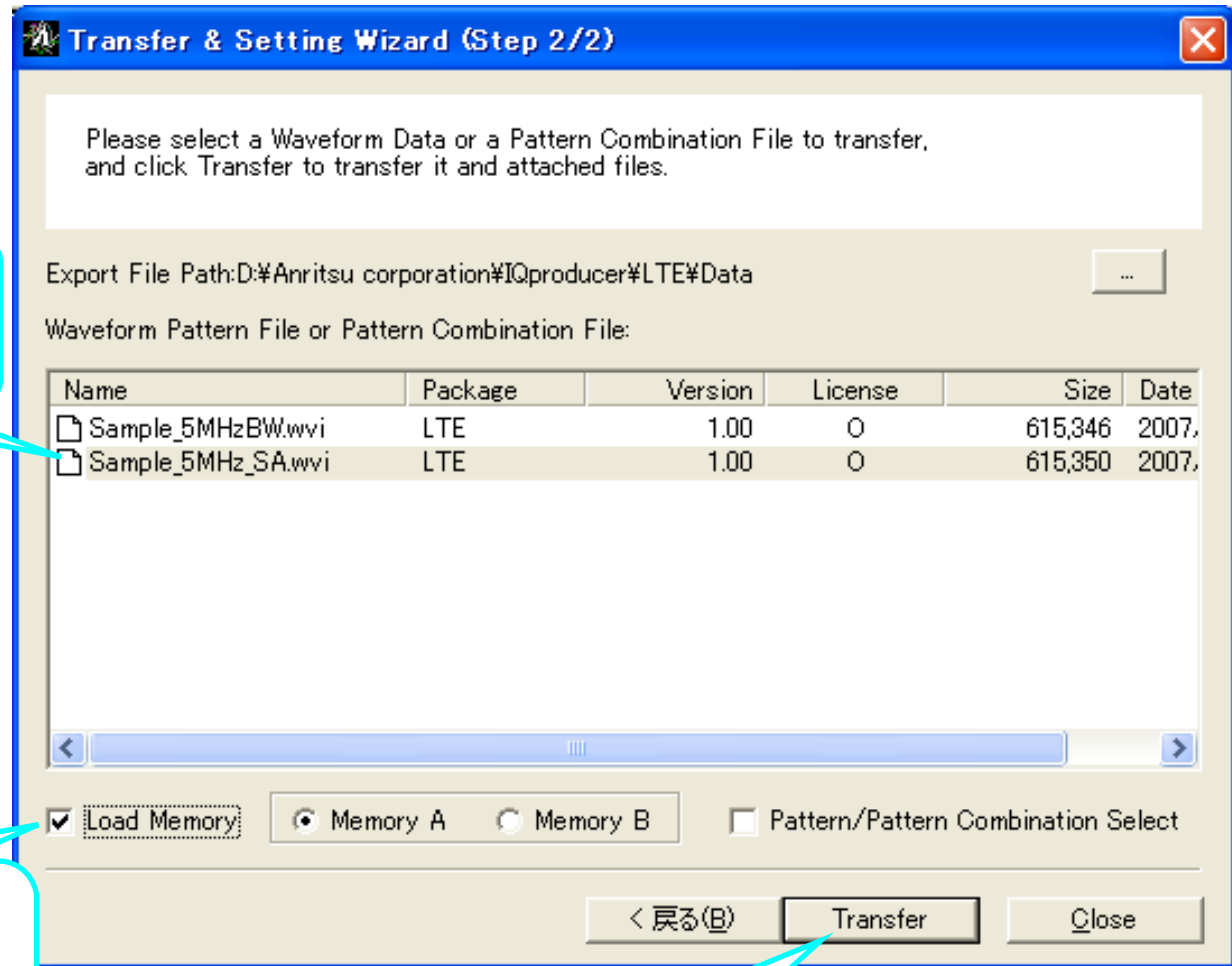


Input Host name or IP address of MG3700A main frame.

Connect to LAN.

\*Read the appended [LAN Connection] for the LAN connection method.

# Transferring Waveform Pattern (2/2)



Select waveform patterns saved on MG3700A hard disk.

Load waveform pattern into memory at same time as transfer.

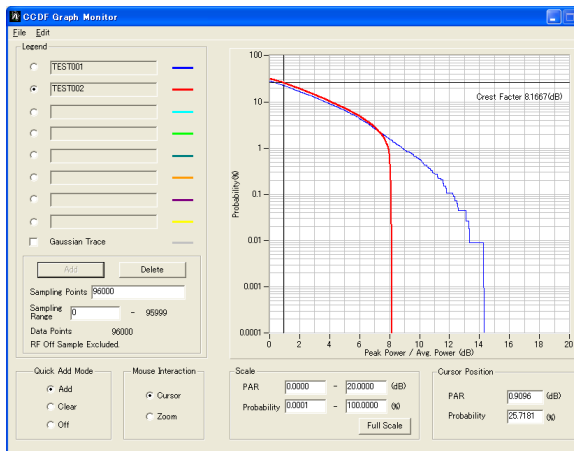
Start transfer.

# Waveform Editing Function: CCDF, FFT, Time Domain

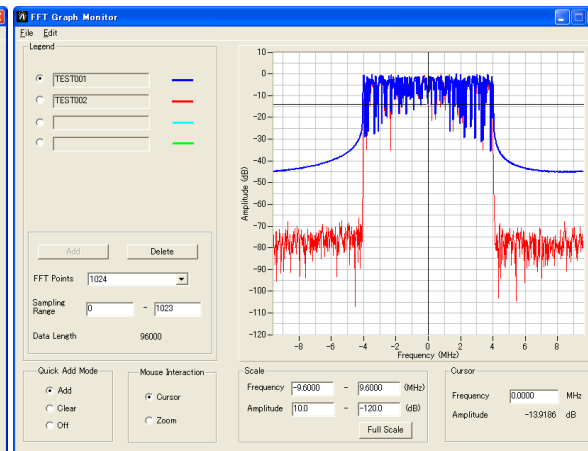
The characteristics of generated waveform patterns are checked using various waveform displays (CCDF, FFT, and Time Domain), Repeat work when intended characteristics are not obtained is cut because the signal PAPR and distortion can be grasped by preloading the waveform pattern in the SG.

Easy comparison of generated waveform-pattern characteristics by simultaneous display of multiple patterns!

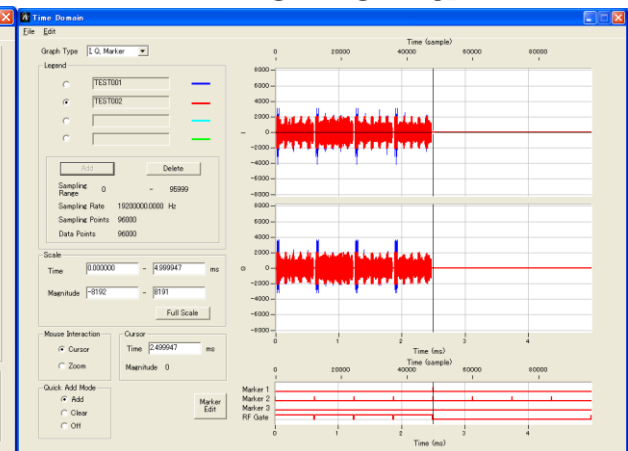
## CCDF



## FFT



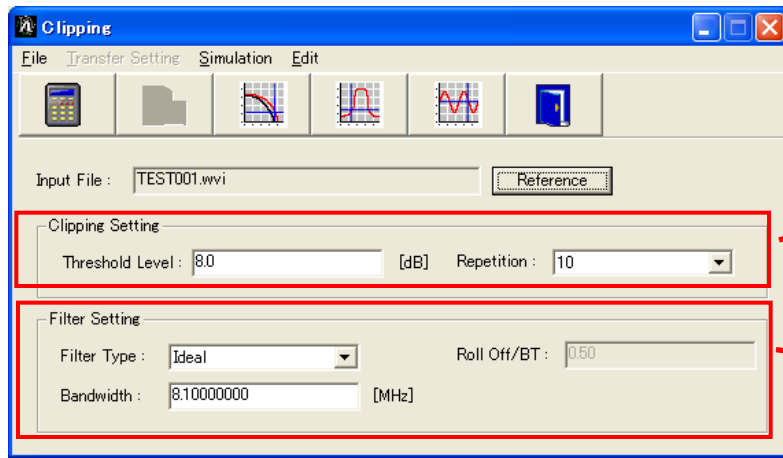
## Time Domain



# Waveform Editing Function: Clipping & Filtering

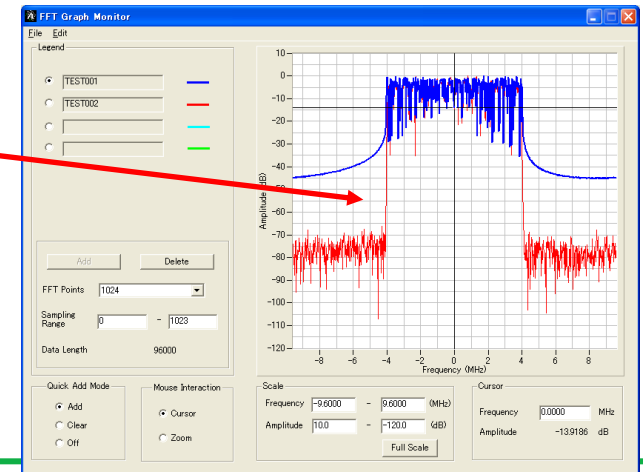
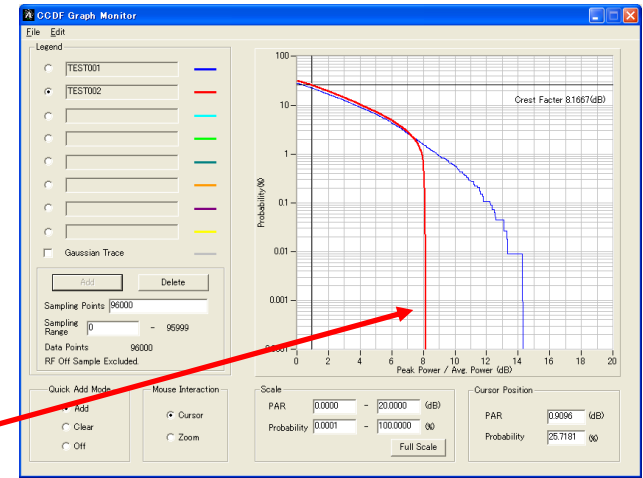
Generated waveform patterns can be easily clipped and filtered to generate test patterns with changed peak average power (PAPR) and distortion.

## Easy Clipping and Filtering



Clipping

Filtering



# Other: Saving/Recalling Parameters

Values and settings for each item can be saved as a parameter file for recall.

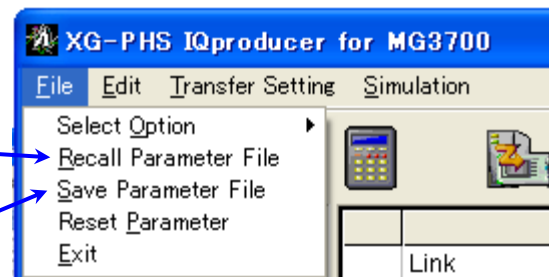


File Recall

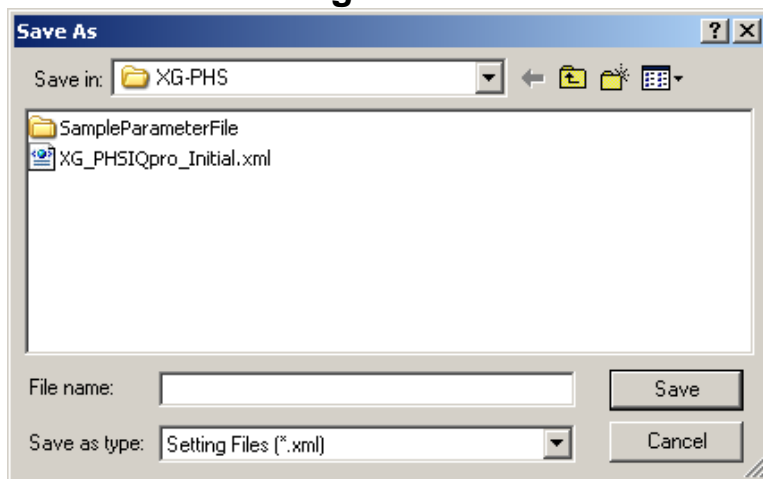
File Save

File Recall

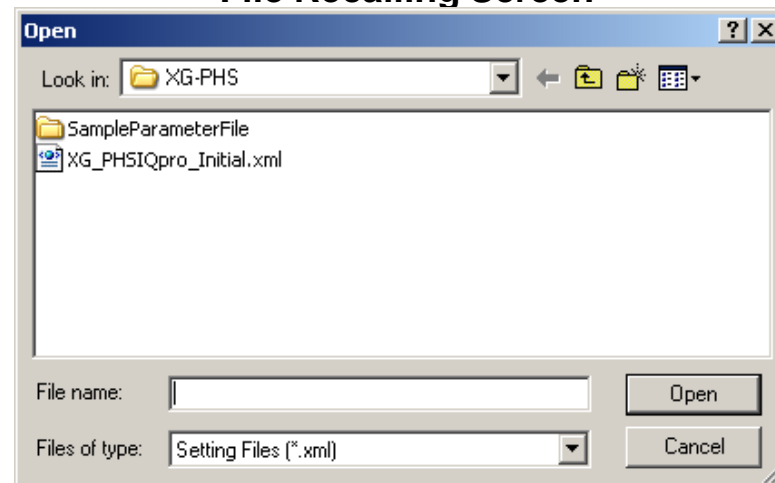
File Save



File Saving Screen



File Recalling Screen





# Appendix

# Ordering Information

Model/ Order No.	Name	Remarks		
<b>— Mainframe —</b>				
MG3700A	Vector Signal Generator		Required	
<b>— Options —</b>				
MG3700A-002	Mechanical Attenuator	Standard Electron Attenuator is changed into Mechanical Attenuator.		
MG3700A-011	Upper Frequency 6 GHz	Standard “250 kHz to 3 GHz” is extended to “250 kHz to 6 GHz.”		
MG3700A-021	ARB Memory Upgrade 512 M sample	Standard “128 Msample/channel × 2” is extended to “256 Msample/channel × 2.”	Recommendation	
MG3700A-031	High Speed BER Test Function	Standard “1 kbps to 20 Mbps” is extended to “100 bps to 120 Mbps.”		
<b>— Softwares (License Key for IQproducer system) —</b>				
MX370109A	XG-PHS IQproducer		Required	
<b>— Optional accessories —</b>				
W2495AE	MG3700A operation manual			
W2496AE	MG3700A IQproducer operation manual			
W2539AE	MG3700A standard waveform pattern operation manual			
W3152AE	MX370109A XG-PHS IQproducer operation manual		Recommendation	The PDF manual is on the software CD. Order this when a booklet is required.
J1261D	Ethernet Cable (Shield Type)	Cross, 3 m	Recommendation	Required when PC connected directly to MG3700A by LAN.
Z0777	Standard waveform pattern upgrade kit	DVD set of pre-install wave form pattern of latest version		
G0141	HDD ASSY	Exchange HDD when built-in HDD break.		
J1277	IQ Output Conversion Adapter	Cable that converts IQ output connector (D-sub) of mainframe into BNC	Recommendation	Converts IQ output connector on back of MG3700A from D-sub to BNC.

# Parameter Setting Range: Common

Display	Remarks	Setting Range
Common		
Link	Sets Uplink and Downlink signals	UL, DL
ECBW	Sets effective channel bandwidth	8.1 MHz, 9.0 MHz, 16.2 MHz, 17.1 MHz, 18.0 MHz
Number of Frames	Sets Uplink and Downlink signals	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
Oversampling Ratio	Sets oversampling ratio	2, 4
Windowing Length	Sets windowing length	0 to 2000ns
Filter Type	Sets filtering	Nyquist, Root Nyquist, Ideal, None
Number of Channels	Sets channel number	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
BSID	Sets ID for Base Station	0x0000 to 0x7FFF
MSID	Sets ID for Mobile Station	0x0000 to 0x7FFF
Scrambling	Sets ON/OFF for Scrambling	ON, OFF
Encode	Sets ON/OFF for Encode	ON, OFF
Interleave	Sets ON/OFF for Interleave	ON, OFF

# Parameter Setting Range: PHY/MAC DL/UL (1/2)

Display	Remarks	Setting Range
<b>CCCH</b>		
CCCH Allocation	Sets PRU number deploying CCCH	1 to 80
Physical Channel Data Type	Sets data inserted in CRC Calculation Area	PN9, PN15, PN23, 16 Bit Repeat, User File, Function Channel
Physical Channel 16 Bit Repeat	Sets 16-bit repeat data inserted in CRC Calculation Area	0000 to FFFF
Physical Channel User File	Sets user file inserted in CRC Calculation Area	Select any file.
Function Channel Data Type	Sets data inserted in BCCH or PCH	PN9, PN15, PN23, 16 Bit Repeat, User File
Function Channel 16 Bit Repeat	Sets 16-bit repeat data inserted in BCCH or PCH	0000 to FFFF
Function Channel User File	Sets user file inserted in BCCH or PCH	Select any file.
<b>ANCH</b>		
ANCH Allocation	Sets PRU number deploying ANCH	1 to 80
Physical Channel Data Type	Sets data inserted in CRC Calculation Area	PN9, PN15, PN23, 16 Bit Repeat, User File, ECCH, ICCH
Physical Channel 16 Bit Repeat	Sets 16-bit repeat data inserted in CRC Calculation Area	0000 to FFFF
Physical Channel User File	Sets user file inserted in CRC Calculation Area	Select any file.
RCH	Sets RCH value	0x00 to 0x7F
MAP Origin	Sets MAP start position	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
MAP	Displays MAP value	0x00000000000000000000 to 0x7FFFFFFFFFFFFFFF
SD	Sets Shift Direction	Stay, One Step Backward, Two Steps Forward, One Step Forward
ANCH PC	Sets ANCH Power Control value	0x0000 0000 to 0xFFFF FFFF
EXCH PC	Sets EXCH Power Control value	0x0000 0000 to 0xFFFF FFFF
PC	Sets Power Control value	0x0000 0000 to 0xFFFF FFFF
ACK	Sets ACK value	0x0 0000 0000 to 0xF FFFF FFFF
V	Sets Validity value	0 to 80
MI	Sets MI value	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
MR	Sets MR value	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
HC	Sets HARQ Cancel	0, 1
Function Channel Data Type	Sets data inserted in MAC Frame	PN9, PN15, PN23, 16 Bit Repeat, User File
Function Channel 16 Bit Repeat	Sets 16 Bit Repeat data inserted in MAC Frame	0000 to FFFF
Function Channel User File	Sets user file inserted in MAC Frame	Select any file.

UL only  
DL only

DL only  
DL only

# Parameter Setting Range: PHY/MAC DL/UL (2/2)

Display	Remarks	Setting Range
EXCH		
EXCH PRU Number	Displays PRU number deploying EXCH	1 to 80
EXCH Allocation	Sets PRU deploying EXCH	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
Physical Channel Data Type	Sets data inserted in CRC Calculation Area	PN9, PN15, PN23, 16 Bit Repeat, User File, EDCH
Physical Channel 16 Bit Repeat	Sets 16 Bit Repeat data inserted in CRC Calculation Area	0000 to FFFF
Physical Channel User File	Sets data file inserted in CRC Calculation Area	Select any file.
Function Channel Data Type	Sets data type inserted in MAC Frame	PN9, PN15, PN23, 16 Bit Repeat, User File
Function Channel 16 Bit Repeat	Sets 16 Bit Repeat data inserted in MAC Frame	0000 to FFFF
Function Channel User File	Sets user file inserted in MAC Frame	Select any file.
MCS	Sets MCS	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
PRU Concatenation	Sets PRU Concatenation	ON, OFF
Validity	Sets effective PRU of EXCH	0 to EXCH PRU Number
CSCH		
CSCH Allocation	Sets PRU number deploying CSCH	1 to 80
Physical Channel Data Type	Sets data inserted in CRC Calculation Area	PN9, PN15, PN23, 16 Bit Repeat, User File, TCH, CDCH
Physical Channel 16 Bit Repeat	Sets 16 Bit Repeat data inserted in CRC Calculation Area	0000 to FFFF
Physical Channel User File	Sets data file inserted in CRC Calculation Area	Select any file.
MCS	Sets MCS	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
MI	Sets MI value	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
MR	Sets MR value	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
SD	Sets Shift Direction	Stay, One Step Backward, Two Steps Forward, One Step Forward
PC	Sets Power Control value	0x0000 0000 to 0xFFFF FFFF
ACK	Sets ACK value	0, 1
Function Channel Data Type	Function Channel Data Type	PN9, PN15, PN23, 16 Bit Repeat, User File
Function Channel 16 Bit Repeat	Sets 16 Bit Repeat data inserted in MAC Frame	0000 to FFFF
Function Channel User File	Sets user file inserted in MAC Frame	Select any file.

DL only

DL only

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