Product Introduction

MX370101A

HSDPA/HSUPA IQproducer™

MG3700A

Vector Signal Generator

For MG3700A Vector Signal Generator

MX370101A
HSDPA/HSUPA IQproducer™
Product Introduction

Version 5.00

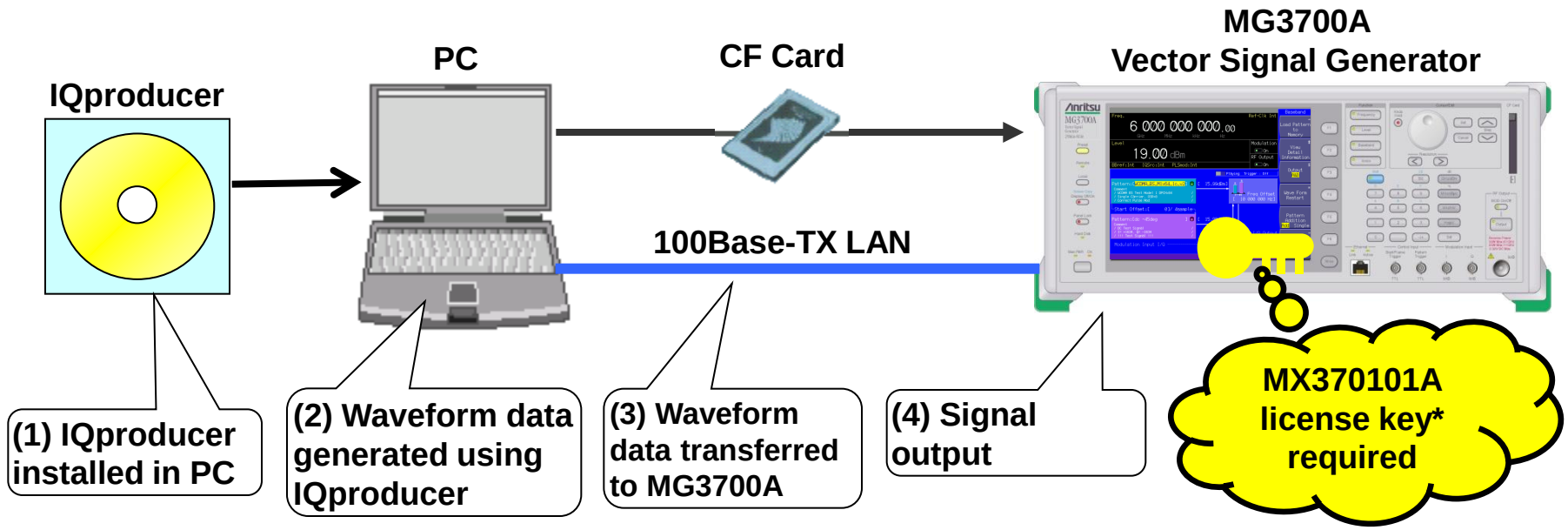
ANRITSU CORPORATION

Ordering Information

Model/Order No.	Name	Remarks	
— Mainframe —			
MG3700A	Vector Signal Generator		Required
— Options —			
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.”	
— Softwares (License Key for IQproducer system) —			
MX370101A	HSDPA/HSUPA IQproducer		Required
— Optional accessories —			
W2495AE	MG3700A operation manual	Booklet	Recommendation The PDF manual is on the software CD. Order this when a booklet is required.
W2496AE	MG3700A IQproducer operation manual	Booklet	
W2539AE	MG3700A standard waveform pattern operation manual	Booklet	
W2503AE	MX370101A HSDPA/HSUPA IQproducer operation manual	Booklet	
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.

What is HSDPA/HSUPA IQproducer?

The MX370101A HSDPA/HSUPA IQproducer is PC application software with a graphical user interface for setting parameters and generating waveform patterns in compliance with 3GPP HSDPA (uplink, downlink). The generated waveform pattern are downloaded to the MG3700A Vector Signal Generator which outputs the baseband signal and RF signal for HSDPA/HSUPA modulation using an arbitrary waveform generation function.



*Install the license key file in the main frame when adding a system license to a shipped unit. The MG3700A main frame does not require return to the factory.

What is HSDPA/HSUPA IQproducer?

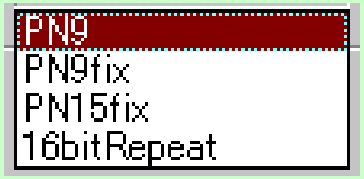
HSDPA/HSUPA IQproducer is PC application software that generates waveform patterns for the MG3700A by setting various downlink and uplink parameters in compliance with the 3GPP standard.
The following channels can be set.
Also, <u>because HSDPA/HSUPA IQproducer generates large waveform pattern files, users should add the memory upgrade option (MG3700A-021).</u>

Downlink

- Scrambling Code

- Channel (CPICH, P-CCPCH, P-SCH, S-SCH, PICH, DPCH, OCNS, HS-SCCH1/2/3/4, HS-PDSCH1/2/3/4)

- DPCH Data



Uplink

- Scrambling Code

- Channel (UL-DPCCH, UL-DPDCH, HS-DPCCH, DPCH, E-DPCCH, E-DPDCDH

- DPCH Data

- Generating waveform patterns using MX3701xxA => 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

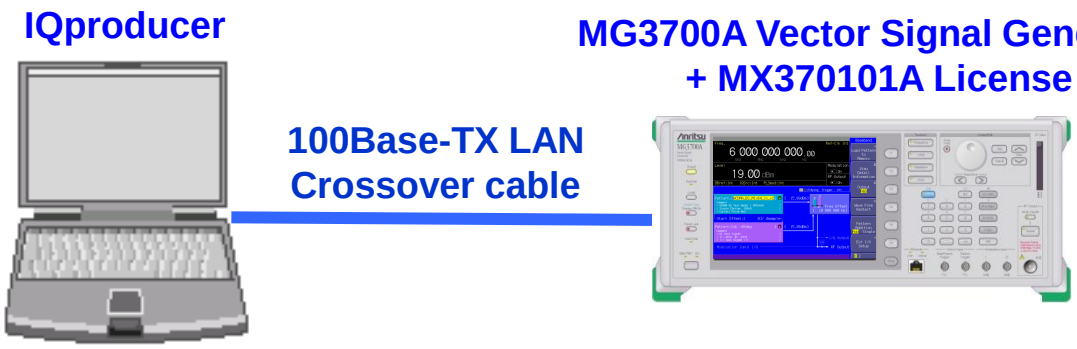
Operation Images

Setup

Connect the MG3700A and PC as shown below.

Install IQproducer in the PC.

Install the MX370101A license key in the MG3700A.



IQproducer™ Operating Environment

CPU	Pentium III, 1 GHz or faster
Memory	≥ 512 Mbytes or more
HDD	≥ 5 Gbytes or more
Display	1024 x 768 pixels or more
OS	Windows2000(R) Professional, Windows XP(R)

*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

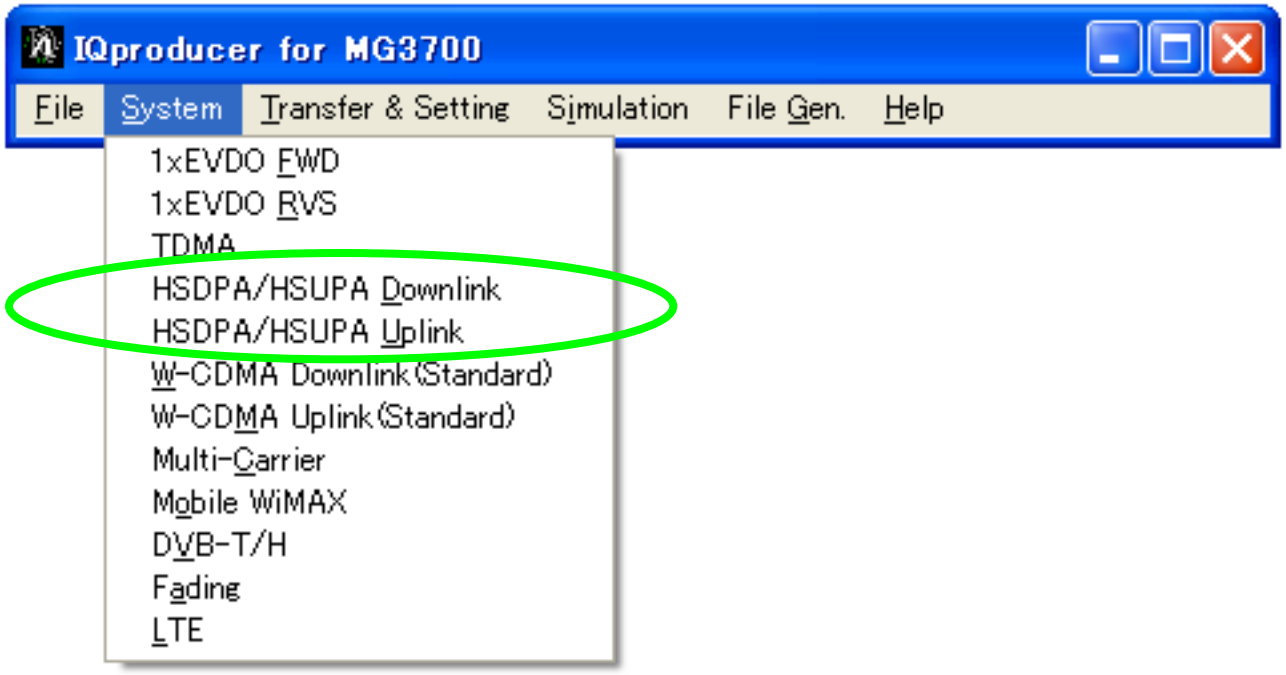
Start IQproducer as follows:

Start > Programs > Anritsu Corporation > IQproducer for MG3700A

IQproducer Main Screen

When IQproducer starts, the following screen is displayed.

Choose HSDPA/HSUPA Uplink or Downlink from the [System] pull-down menu.



Editing Parameters: Downlink

When HSDPA/HSUPA Downlink is chosen at [System], various Downlink parameters can be set according to the standard. (See "Downlink:parameter setting range" below for details.)

In addition, the Downlink Easy Setup function offers default parameter sheets for "Fixed Reference Channel (FRC) of HSDPA defined in 3GPP TS25.101" and "Reference Measurement Channel (RMC) defined in 3GPP TS25.101/TS25.104." Parameters are set just by choosing an item and the waveform pattern is generated.

[Easy Setup]

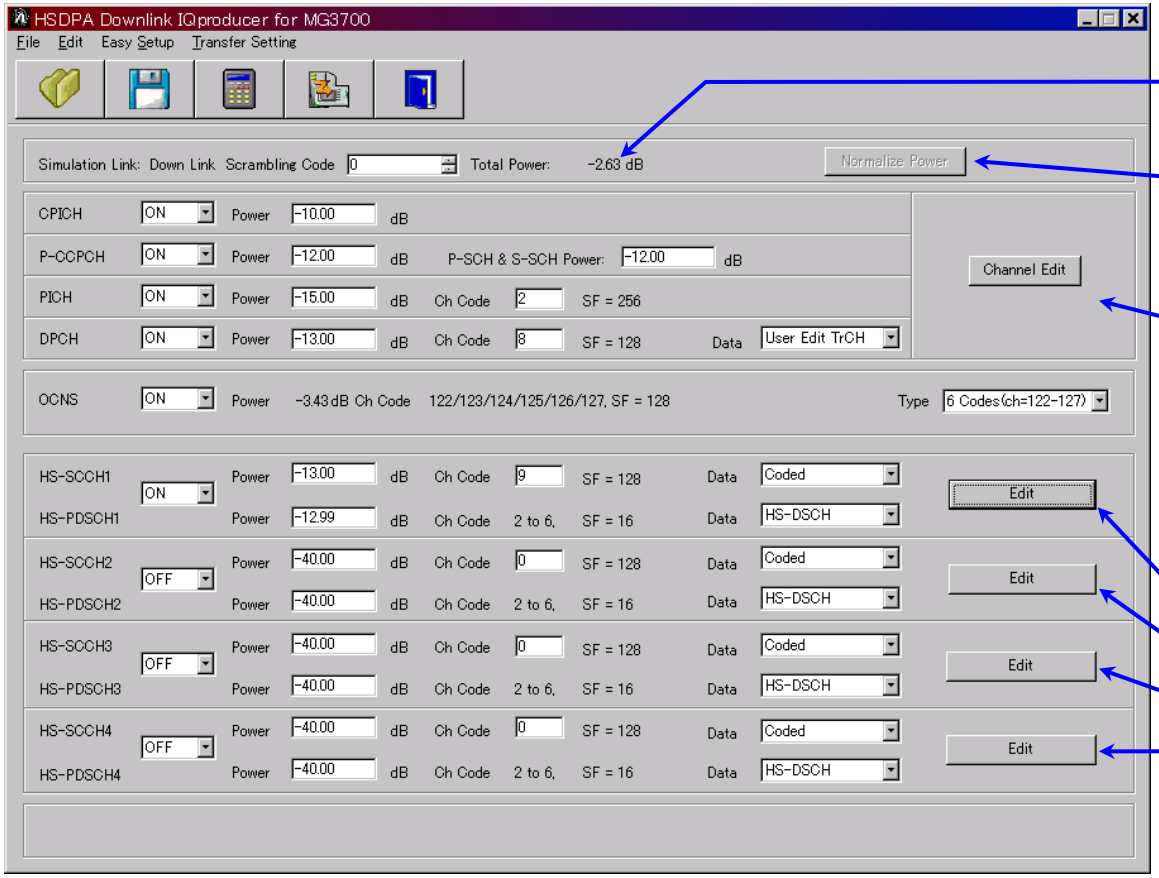
FRC:
H-Set1 (QPSK)
H-Set1 (16QAM)
H-Set2 (QPSK)
H-Set2 (16QAM)
H-Set3 (QPSK)
H-Set3 (16QAM)
H-Set4
H-Set5

RMC:
RMC12.2 Kbps (for RX test)
RMC12.2 Kbps (for Performance test)
RMC64 Kbps (for Performance test)
RMC144 Kbps (for Performance test)
RMC384 Kbps (for Performance test)

Editing Parameters: Downlink

When HSDPA/HSUPA Downlink is chosen at [System], the following setting screen is displayed.

The P-CCPCH, DPCH, HS-SCCH 1-4, and HS-PDSCH 1-4 parameters are set using the [Edit] menu.



Total Power: Displays total power of all ON channels (except OCNS)

Normalize Power: Sets Total Power to 0 dB, maintaining power ratio of all ON channels

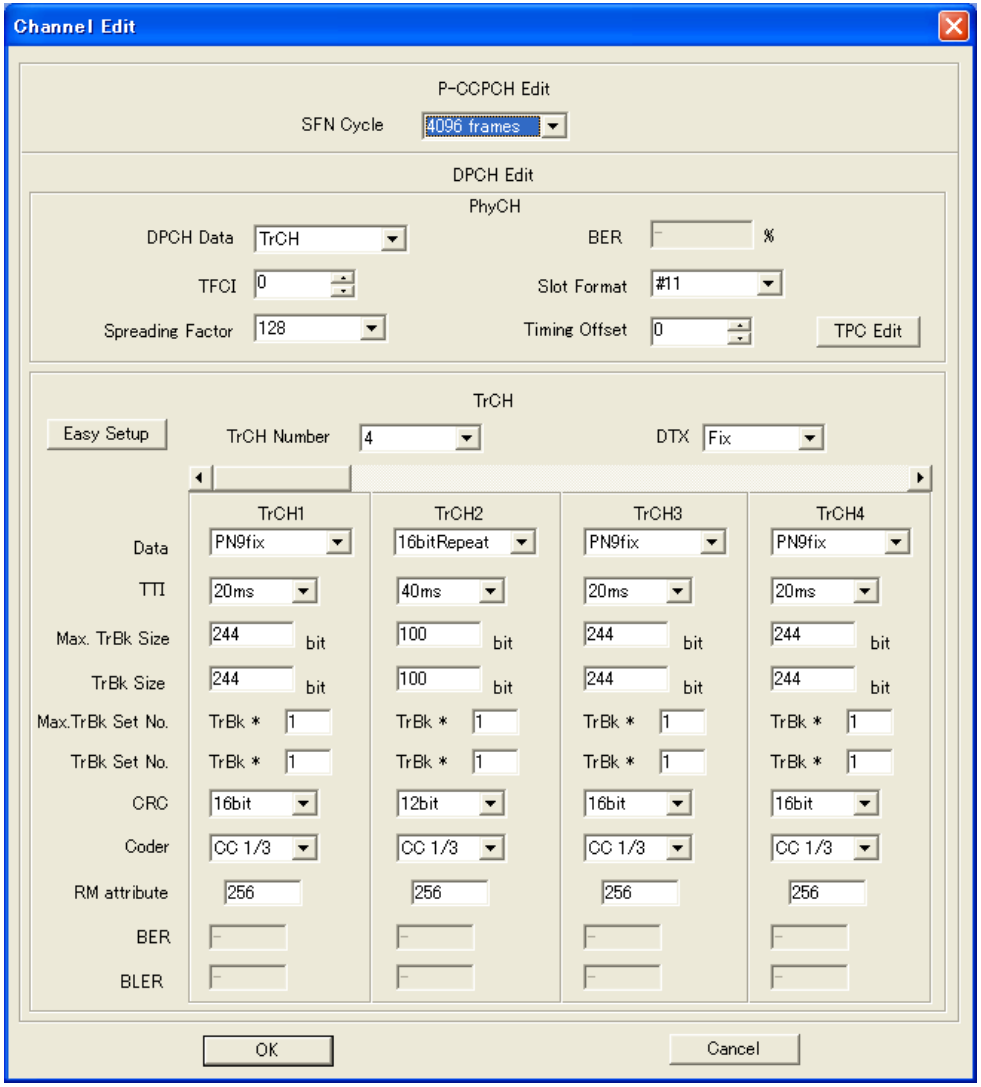
This is enabled at the OCNS = OFF setting.

Channel Edit: Starts parameter setting screen for P-CCPCH and DPCH [See the next page.]

Edit: Performs HS-SCCH 1-4 and HS-PDSCH 1-4 setup and starts parameter setting screen for PCCPCH and DPCH [See the next page.]

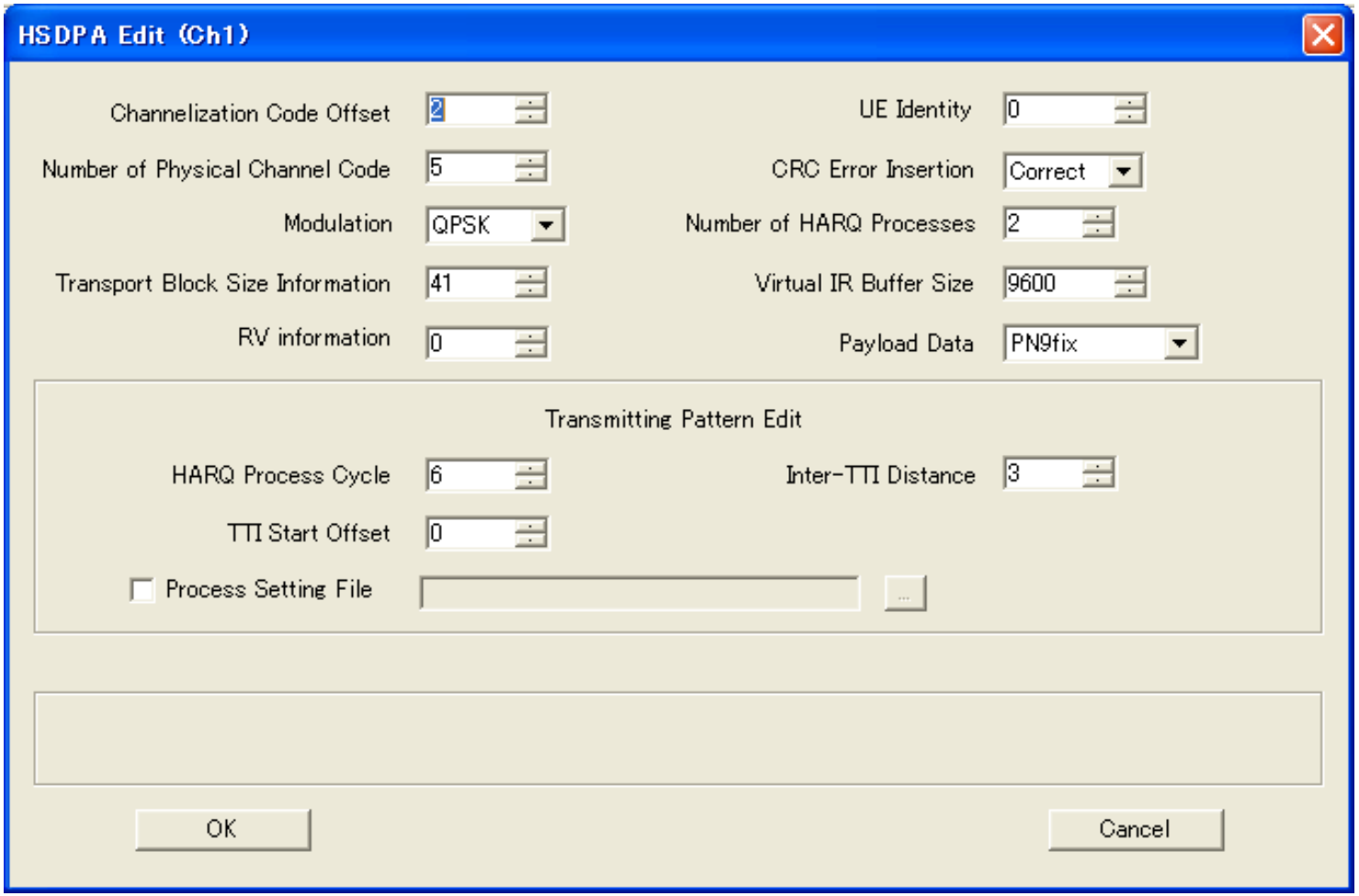
Editing Parameters: Downlink

Channel Edit Screen



Editing Parameters: Downlink

HSDPA Edit Screen



Editing Parameters: Downlink/ Parameter Setting Range (1/3)

Main Screen

Display	Setting range	
Scrambling Code		0 to 8191
CPICH	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	0 only
P-CCPCH	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	P-SCH & S-SCH Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	1 only
PICH	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	0 to 255
DPCH	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	0 to SF –1 The spreading factor (SF) varies depending on the [Data] setting as follows: RMC 12.2 Kbps = 128, RMC 64 Kbps = 32, RMC 144 Kbps = 16, RMC 384 Kbps = 8, AMR1/AMR2/AMR3 = 128, ISDN = 32, 384 Kbps Packet = 8, User Edit TrCH = Spreading Factor of Channel Edit screen
	Data	RMC12.2 Kbps/RMC 64 Kbps/RMC 144 Kbps/RMC 384 Kbps /AMR1/AMR2/AMR3/ISDN/384 Kbps Packet/User Edit TrCH
OCNS	ON/OFF	ON or OFF
	Type	16 Codes or 6 Codes(ch=122-127), 6 Codes(ch=2-7)
HS-SCCH1/2/3/4	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	0 to 127
	Data	PN9/PN9fix/PN15fix/16bitRepeat/Coded
HS-PDSCH1/2/3/4	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Channelization Code	0 to 15
	Data	PN9/PN9fix/PN15fix/16bitRepeat/HS-DSCH

Editing Parameters: Downlink/ Parameter Setting Range (2/3)

Channel Edit Screen

Display	Setting range	
P-CCPCH Edit	SFN Cycle	Short or 4096
DPCH Edit (Phy CH)	DPCH Data	PN9/PN9fix/PN15fix/16bitRepeat/TrCH
	TFCI	0 to 1023
	Spreading Factor	4, 8, 16, 32, 64, 128, 256, 512
	BER	0.0 to 100.0%, Resolution 0.1 %
	Slot Format	#0 to #16
	Timing Offset	0 to 149
	TPC Edit	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 to 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111
DPCH Edit (TrCH Edit)	TrCH Number	1 to 8
	DTX	Fix/Flex
	Data	PN9/PN9fix/PN15fix/16bitRepeat
	TTI	10, 20, 40, 80 ms
	Max. TrBk Size	0 to 5000
	TrBk Size	0 to 5000
	Max TrBk Set No.	0 to 64
	TrBk Set No.	0 to 64
	CRC	0, 8, 12, 16, 24 bit
	Coder	CC1/2, CC1/3, TC
	RM attribute	1 to 256
	BER	0.0 to 100.0%, Resolution 0.1 %
	BLER	0 to 100%, Resolution 1 %

Editing Parameters: Downlink/ Parameter Setting Range (3/3)

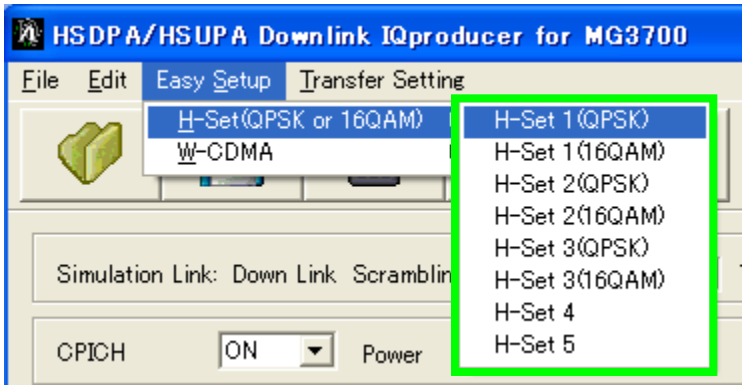
HSDPA Edit Screen

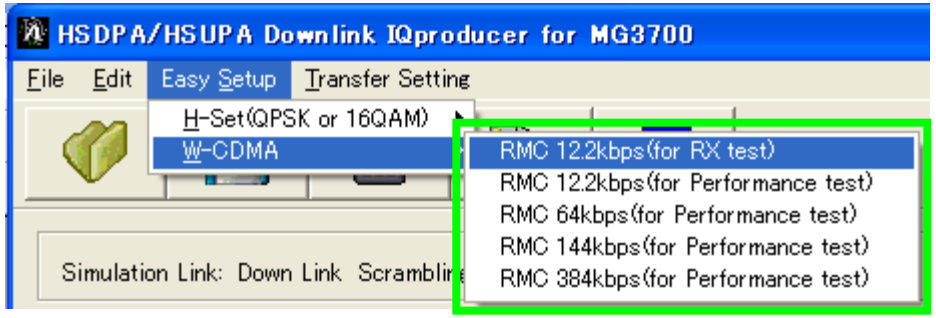
Display	Setting range	
HSDPA transport channel (HS-SCCH, HS-PDSCH parameters)	Channelization Code Offset	1 to (16 - "Number of Physical Channel Code")
	Number of Physical Channel	1 to (16 - "Channelization Code Offset")
	Modulation	QPSK or 16QAM
	Transport Block Size Informat	0 to 63
	RV Information	0 to 7
	UE Identity	0 to 65535
	CRC Error Insertion	Correct or Fail
	Number of HARQ Processes	0 to 8
	Virtual IR Buffer Size	800 to 304000
	Payload Data	PN9/PN9fix/PN15fix/16bitRepeat
Transmitting Pattern Edit	HARQ Process Cycle	1 to 16 (Note that it ranges from 1 to 6 if PN9 has been set for Payload Data.)
	Inter-TTI Distance	1 to 8
	TTI Start Offset	0 to 7
	Process Setting File	Used or Not used

Editing Parameters: Downlink/ Easy Setup Function

The Downlink Easy Setup function offers default parameter sheets for "Fixed Reference Channel (FRC) of HSDPA defined in 3GPP TS25.101" and "Reference Measurement Channel (RMC) defined in 3GPP TS25.101/TS25.104."

Since the default is displayed for the selected item, the initial work is easy.





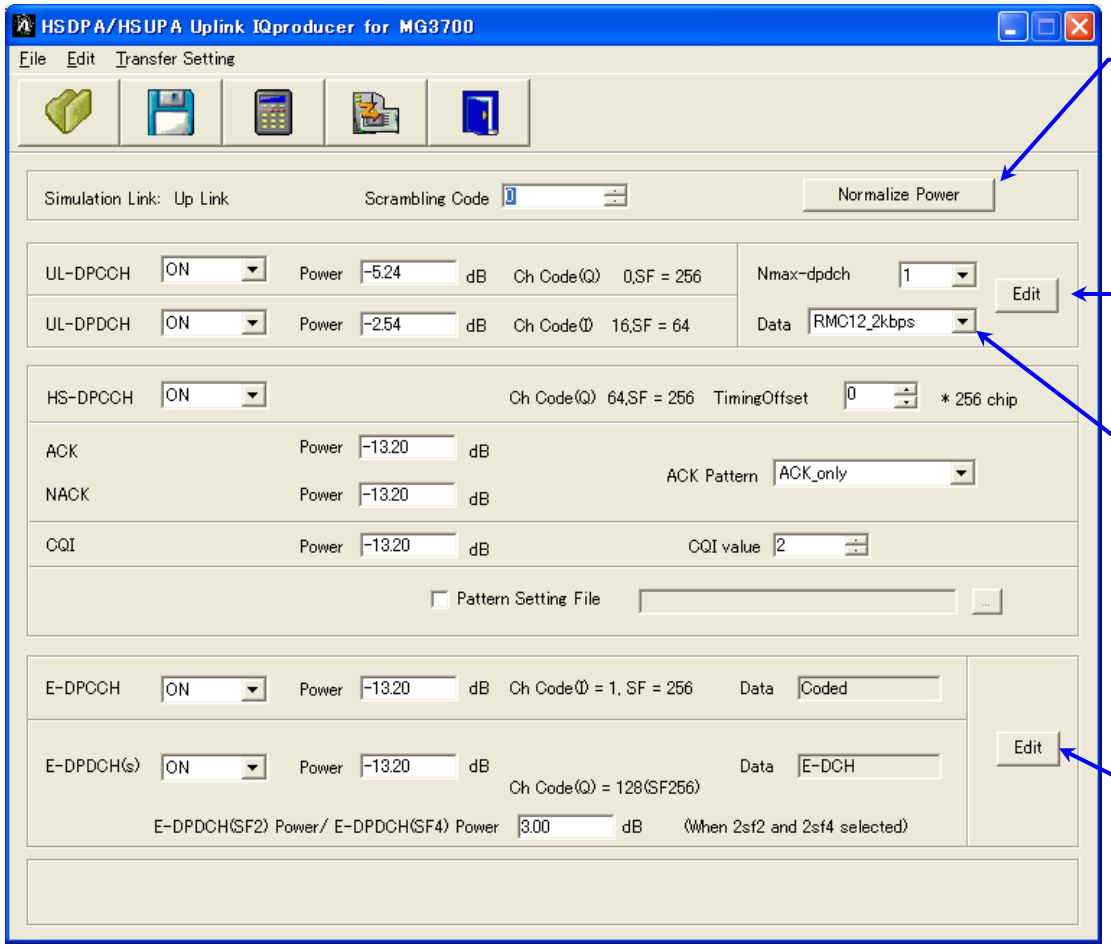
[Easy Setup]

FRC:
H-Set1 (QPSK)
H-Set1 (16QAM)
H-Set2 (QPSK)
H-Set2 (16QAM)
H-Set3 (QPSK)
H-Set3 (16QAM)
H-Set4
H-Set5

RMC:
RMC12.2 Kbps (for RX test)
RMC12.2 Kbps (for Performance test)
RMC64 Kbps (for Performance test)
RMC144 Kbps (for Performance test)
RMC384 Kbps (for Performance test)

Editing Parameters: Uplink

The following screen is displayed when HSDPA/HSUPA Uplink is chosen at [System]. The UL-DPCCH, UL-DPDCH, and HS-DPCCH parameters are set to generate the waveform pattern. (See "Uplink:parameter setting range" below for details.)



Normalize Power: Sets Total Power to 0 dB, maintaining power ratio of all ON channels For HS-DPCCH, the greatest value is chosen from ACK, NACK, and CQI and used for calculation.

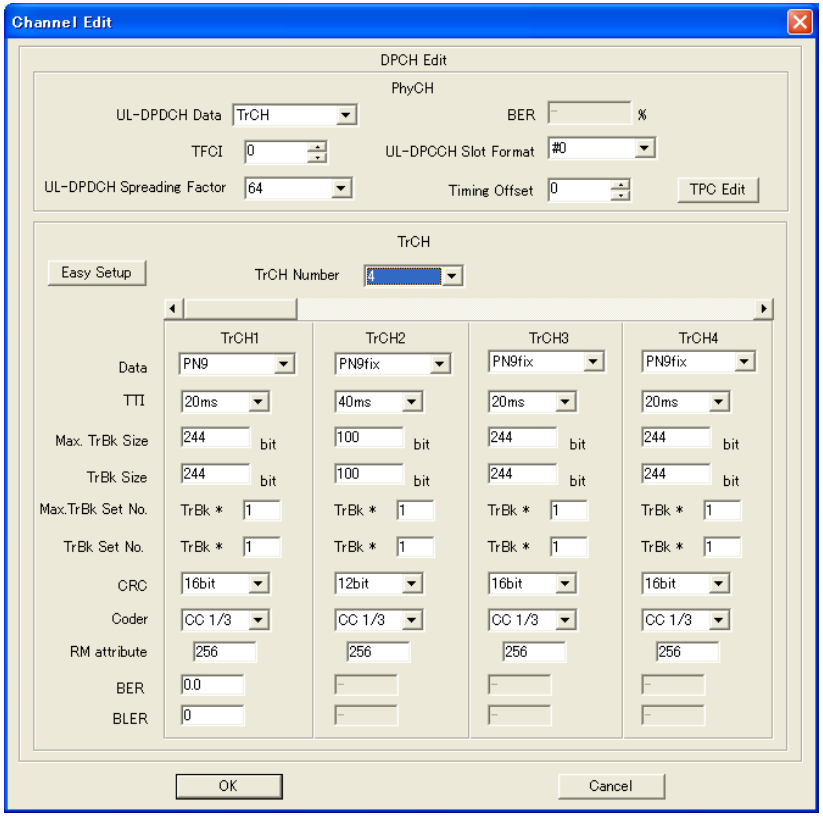
Channel Edit:
Starts Channel Edit screen to set DPCH parameters

HSUPA Edit:
Opens HSUPA Edit screen for setting

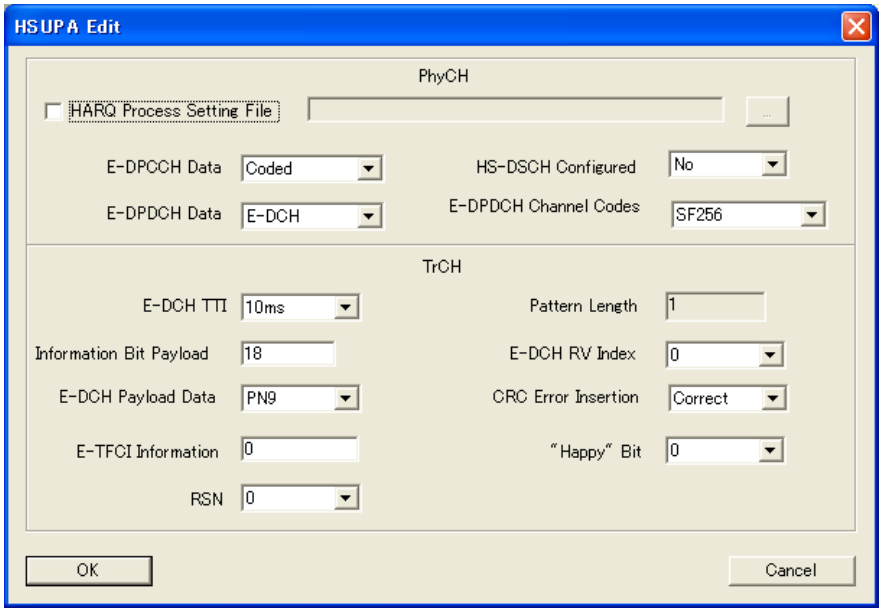
E-DPDCH/E-DPCCH Physical Layer/Transport Layer parameters

Editing Parameters: Uplink

Channel Edit Screen



HSUPA Edit Screen



Editing Parameters: Uplink/ Parameter Setting Range (1/3)

Main Screen

Display	Setting range	
Scrambling Code		0 to 16777215
UL-DPCCH, UL-DPDCH	Channel ON/OFF	ON or OFF
	Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	Nmax-dpdch	0, 1
	Data	RMC 12.2 Kbps/RMC 64 Kbps/RMC 144 Kbps/RMC 384 Kbps /AMR1/AMR2/AMR3/ISDN/64 Kbps Packet/User Edit TrCH
HS-DPCCH	ON/OFF	ON or OFF
	Timing Offset	0 to 149
	ACK Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	NACK Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	CQI Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	ACK Pattern	ACK_only, NACK_only, alt_ACK_NACK_DTX
	CQI Value	0 to 30
	Pattern Setting File	Used or Not used
E-DPCCH, E-DPDCH	E-DPCCH ON/OFF	ON or OFF
	E-DPDCH ON/OFF	ON or OFF
	E-DPCCH Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	E-DPDCH Power	–40.00 to 0.00 dB, Resolution 0.01 dB
	E-DPDCH (SF2) Power/ E-DPDCH (SF4) Power	–10.00 to 10.00 dB, Resolution 0.01 dB

Editing Parameters: Uplink/ Parameter Setting Range (2/3)

Channel Edit Screen

Display	Setting range	
DPCH Edit (Phy CH)	UL-DPDCH Data	PN9/PN9fix/PN15fix/16bitRepeat/TrCH
	TFCI	0 to 1023
	Spreading Factor	4, 8, 16, 32, 64, 128, 256
	BER	0.0 to 100.0%, Resolution 0.1 % (This setting is valid when [Data] is set to [PN9].)
	Slot Format	#0 to #1 (These settings are enabled only when [UL-DPDCH Data] is set to [TrCH].)
	Timing Offset	0 to 149
	TPC Edit	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 to 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111
DPCH Edit (TrCH Edit)	TrCH Number	1 to 8
	Data	PN9/PN9fix/PN15fix/16bitRepeat
	TTI	10, 20, 40, 80 ms
	Max. TrBk Size	0 to 5000
	TrBk Size	0 to 5000
	Max TrBk Set No.	0 to 64
	TrBk Set No.	0 to 64
	CRC	0, 8, 12, 16, 24 bit
	Coder	CC1/2, CC1/3, TC
	RM attribute	1 to 256
	BER	0.0 to 100.0%, Resolution 0.1 % (This setting is valid when [Data] is set to [PN9].)
	BLER	0 to 100%, Resolution 1 % (This setting is valid when [Data] is set to [PN9].)

Editing Parameters: Uplink/ Parameter Setting Range (3/3)

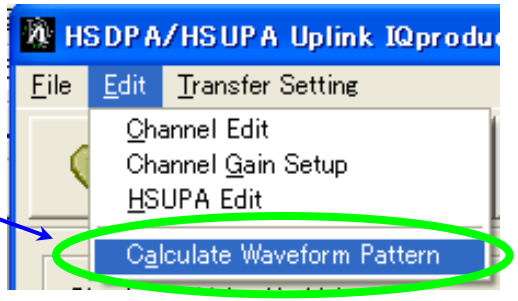
HSUPA Edit Screen

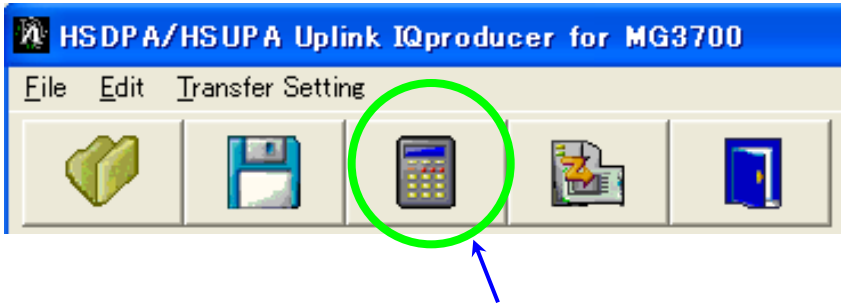
Display	Setting range	
E-DPDCH and E-DPCCH Edit (Phy CH)	HARQ Process Setting File	Common dialog opens when checkbox checked and HARQ Process Setting File selected
	E-DPCCH Data	PN9, PN9fix, PN15fix, 16bit repeat, Coded
	E-DPDCH Data	PN9, PN9fix, PN15fix, 16bit repeat, E-DCH
	HS-DSCH Configured	Yes, No
	E-DPDCH Channel Codes	SF256, SF128, SF64, SF32, SF16, SF8, SF4, 2SF4, 2SF2, 2SF2and2SF4
E-DPDCH and E-DPCCH Edit (Tr CH)	E-DCH TTI	2 ms, 10 ms
	Information Bit Payload	18 to 11484 (at E-DCH TTI = 2 ms) 18 to 20000 (at E-DCH TTI = 10 ms)
	E-DCH Payload Data	PN9, PN9fix, PN15fix, 16bit repeat
	E-TFCI Information	0 to 127
	RSN	0 to 3
	Pattern Length	Display only
	E-DCH RV Index	0 to 3
	CRC Error Insertion	Correct, Error
	Happy Bit	0, 1

Generating Waveform: Calculation

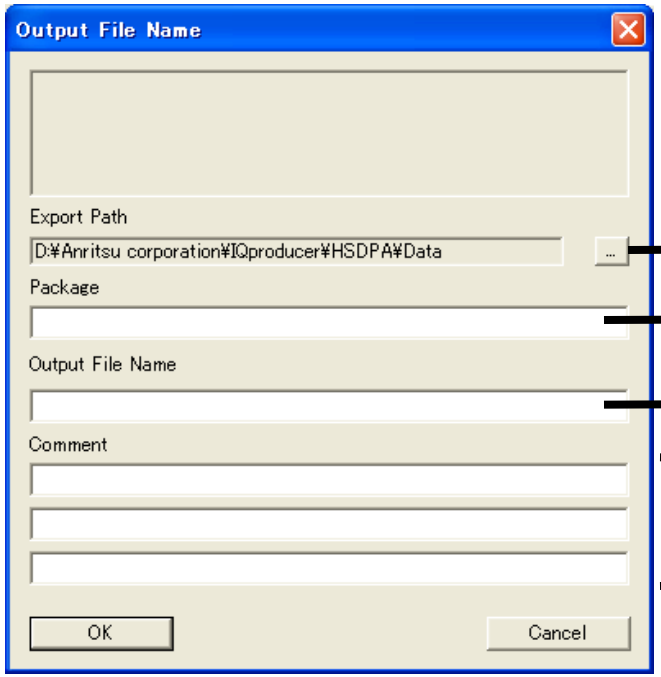
Click the [Calculation] icon to start creation of the waveform pattern after setting the parameters.

Calculation: Creates waveform pattern





Calculation: Creates waveform pattern



File export destination folder

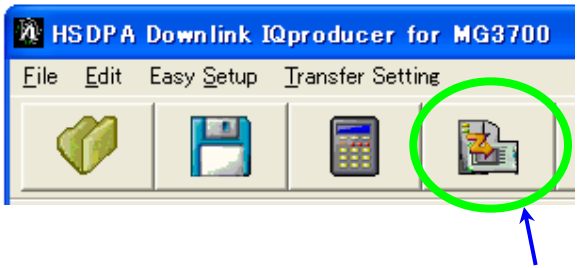
Name of waveform pattern package (31 characters max)

Name of waveform pattern file 20 characters max

Comment on MG3700A screen 38 characters max per line

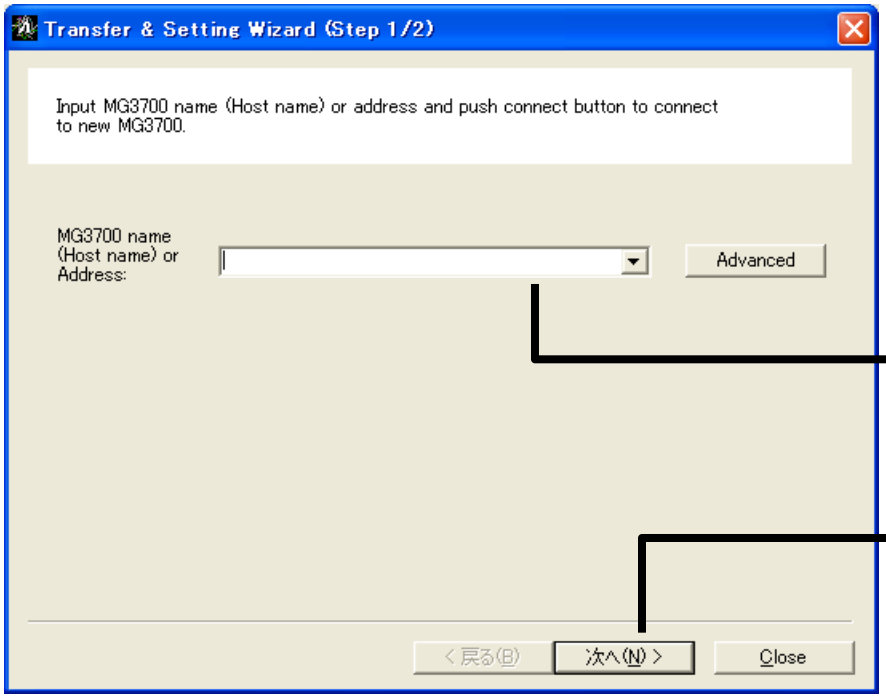
Transferring Waveform Pattern

Connect the MG3700A and PC via a LAN.



Transfer & Setting Wizard

Transfer & Setting Wizard

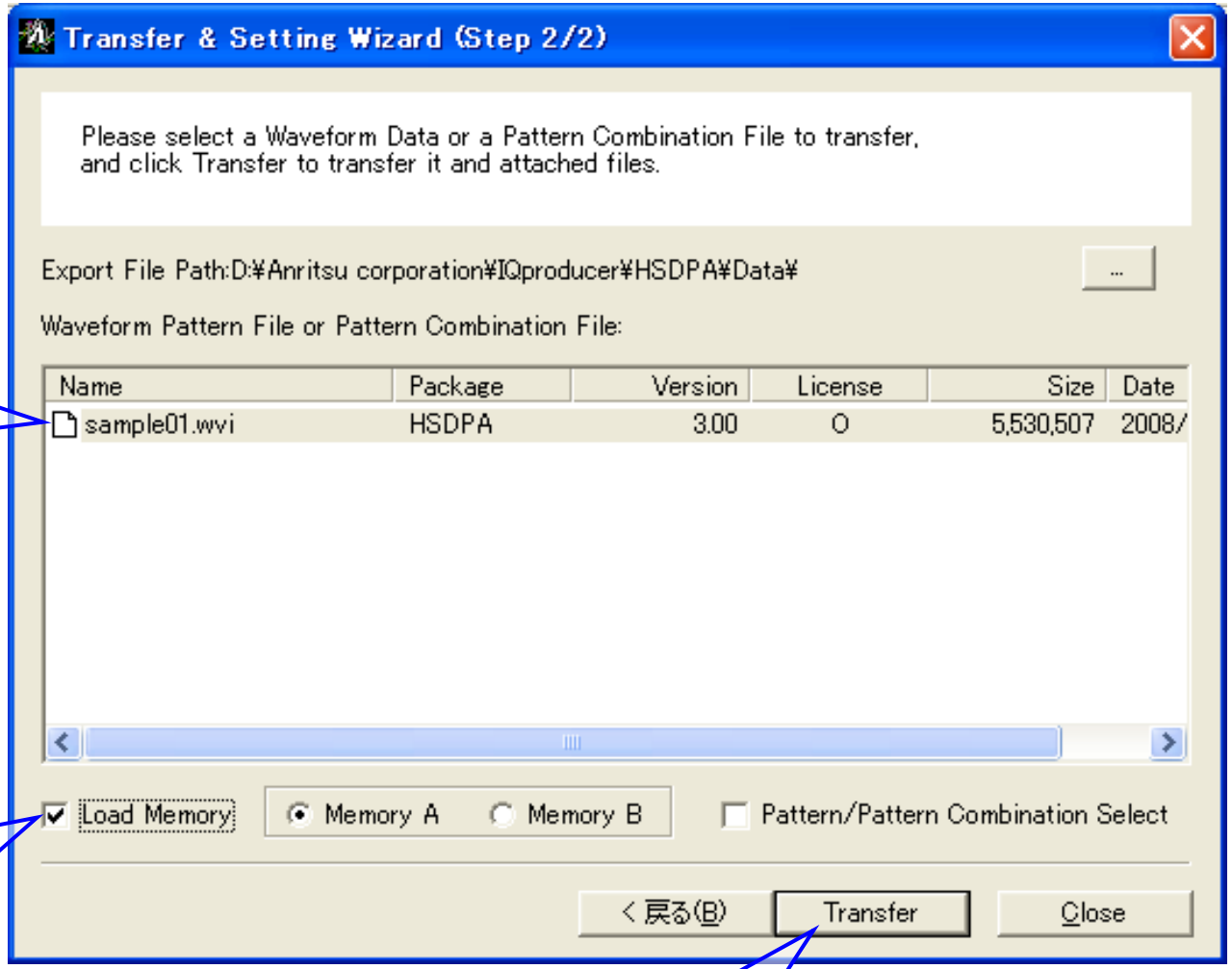


Input name or IP address of MG3700A.

Connects to LAN

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

Transferring Waveform Pattern



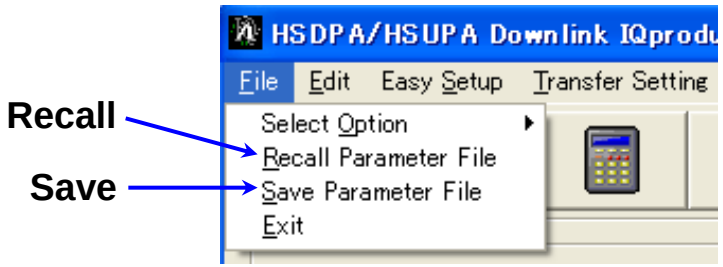
Select waveform pattern saved on MG3700A HDD.

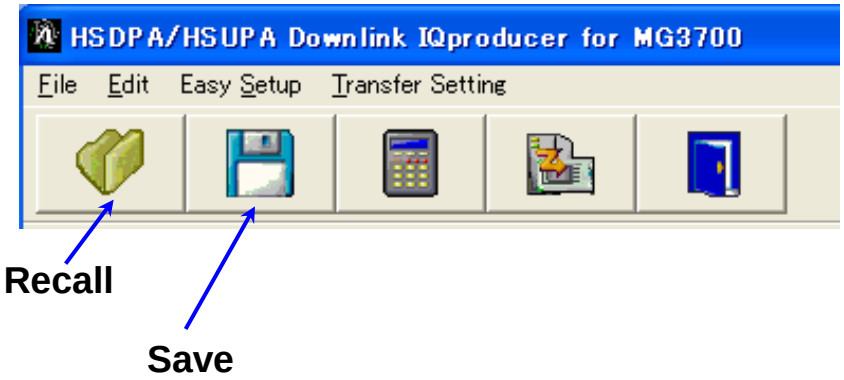
Select when loading waveform pattern into memory at same time as transferring.

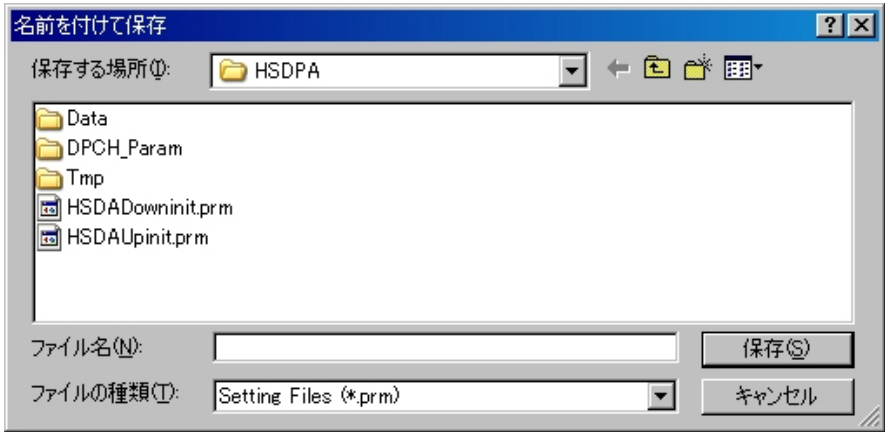
Starts transfer

Saving/Recalling Parameters

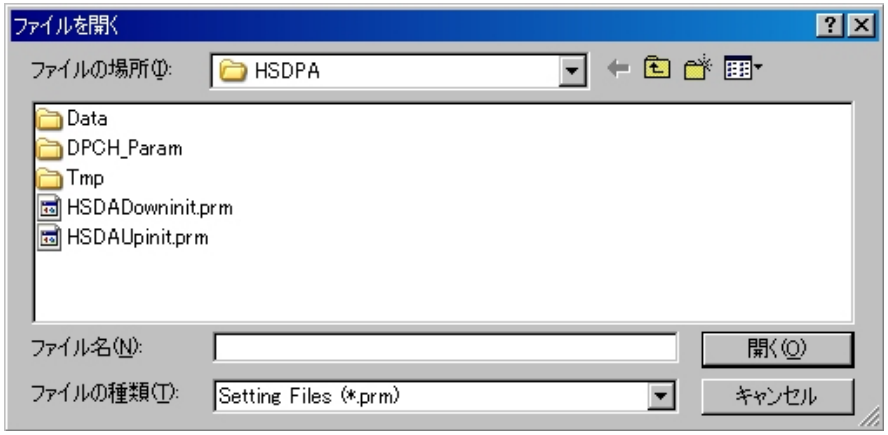
Save the numeric values and settings for each item as a parameter file for instant recall.







File Save Screen



File Recall Screen

Anritsu

Specifications are subject to change without notice.

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