Product Brochure

Anritsu

Excellent Eco Product

MD8470A

Signalling Tester

MX847010A W-CDMA/GSM Simulation Kit
MX847010A-01 EGPRS Software
MX847010A-11 HSDPA Software
MX847010A-12 HSUPA Software
MX847015A Energy Management Test Simulator
MX847015A-01 Parallel Phone Test Software for ETS
MX847016A Multi-cell Network Simulator

W-CDMA/HSDPA/HSUPA
GSM/GPRS/EGPRS

Excellent Eco Product

On-the-Bench Global Mobile Communications Network for Wireless Application Developers

Mobile terminal applications are becoming increasingly important in today's global wireless communications market. Success now depends on the ability to bring attractive mobile terminals to market ahead of the competition as well as on basic technology advances. Because it can quickly test a wide range of applications, the MD8470A Signalling Tester accelerates development of mobile terminals and services when time-to-market is critical.

- All-in-one platform supporting functional testing of mobile terminal applications, including voice and video calling, content download, messaging
- Simple call processing testing
  W-CDMA/HSDPA/HSUPA: Voice/Video/Packet/SMS/MMS
  GSM/GPRS/EGPRS: Voice/Packet/SMS/MMS
  CDMA2000 1X/1xEV-DO Rev. A:
      Voice (echo back)/Packet/SMS/MMS
  TD-SCDMA: Voice/Packet/SMS
- Multiple communication systems
  (W-CDMA/HSDPA/HSUPA, GSM/GPRS/EGPRS,
  CDMA2000 1X/1xEV-DO Rev. A, TD-SCDMA)
- Wide frequency coverage (400 MHz to 2.7 GHz)

CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).

MD8470A
Signalling Tester

Features

All-in-one platform for functional testing of mobile terminal applications, including voice and video calling, content download, messaging

The MD8470A Signalling Tester is the optimum solution for developing attractive mobile terminals by supporting application development, such as voice calling, packet communications including browsing/content download, video calling, SMS/MMS messaging, and End-to-End UE testing (with single MD8470A).

The MD8470A is an effective tool for configuring an integrated simulation environment for application development.
And the built-in PPP server, Ethernet, ISDN, handset and serial I/O interfaces also support various data communication services.

Application Test Setup

Mobile terminal

RF

Handset
(For Voice Call Test)

*Connect to application server function in MD8470A built-in PC.

Ethernet

Application Server
(For Packet Communication Test)
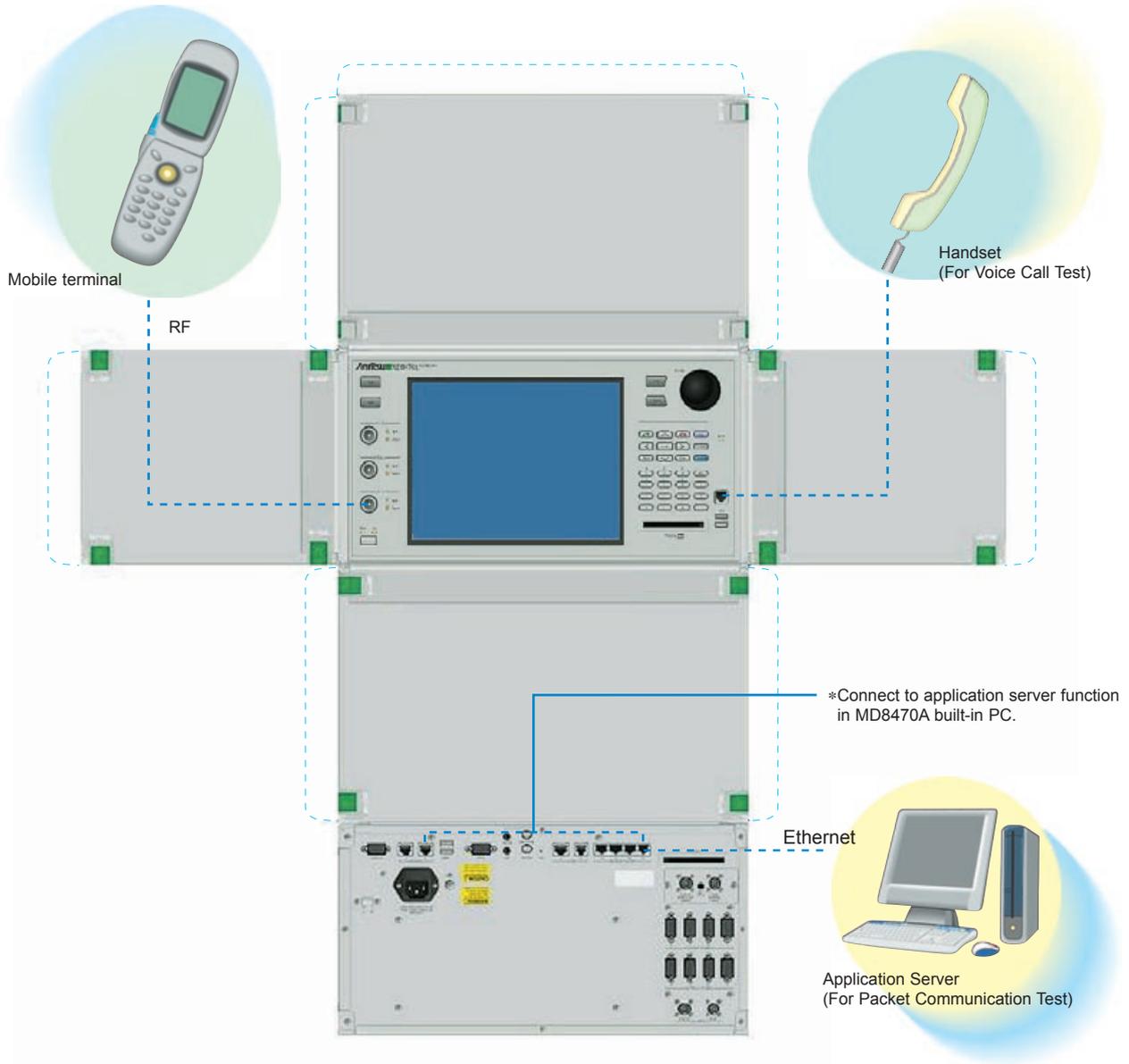
Call Processing using Simple Operations

- **W-CDMA/HSDPA/HSUPA: Voice/Video call/Packet/SMS/MMS**
- **GSM/GPRS/EGPRS: Voice/Packet/SMS/MMS**
- **CDMA2000 1X/1xEV-DO Rev. A: Voice/Packet/SMS/MMS**
- **TD-SCDMA: Voice/Packet/SMS**

The MD8470A Signalling Tester supports basic call processing for W-CDMA/HSDPA/HSUPA (Voice call/Video call/Packet communications/SMS/MMS), GSM/GPRS/EGPRS (Voice call/Packet communications/SMS/MMS), CDMA2000 1X/1xEV-DO Rev. A (Voice call (echo back)/Packet communications/SMS/MMS) TD-SCDMA (Voice call/Packet communications/SMS).
The simulation environment required for testing application tests is implemented by simple operations.

Platform Architecture

- Base station functions are simulated by installing communication system hardware and control software.
- The user interface (displayed on a 10.4-inch screen) is based on Windows XP Professional, so simulations can be controlled without a remote PC.
- The small-footprint chassis [426 (W) x 221.5 (H) x 281 (D) mm] is ideal for configuring an on-the-bench personal simulation environment.

Windows® is a registered trademark of Microsoft Corporation in the USA and other countries.

Multiple Communication Systems Support

- **W-CDMA/HSDPA/HSUPA**
- **GSM/GPRS/EGPRS**
- **CDMA2000 1X/1xEV-DO Rev. A**
- **TD-SCDMA**

The MD8470A complies with the GSM/GPRS/EGPRS, W-CDMA/HSDPA/HSUPA, CDMA2000 1X/1xEV-DO Rev. A and TD-SCDMA standards regulating the world's major 2.5G, 3G and 3.5G mobile communication systems.
Seamless coverage of a wide frequency band (400 MHz to 2700 MHz) supports development of multiband mobile terminals and future expanded frequency band.

MX847010A W-CDMA/GSM Simulation Kit

The MD8470A Signalling Tester is a benchtop wireless network simulator supporting various call processing functions and services for wireless application developers.

Simple Application Testing

WNS: Wireless Network Simulator

The WNS is a software application for simulating an interactive mobile network on the MD8470A Signalling Tester.[*1]
WNS activates the required communication bearers based on requests by the mobile terminal, so application developers can easily implement an End-to-End test environment.
Developers use the Windows-based GUI to set basic call processing parameters and display the call processing status.
In addition, call origination and termination is controlled using a WNS virtual terminal. WNS also supports network simulation functions for MMS (Multimedia Messaging Service), a popular messaging service worldwide.
Configuring a system composed of an MMS test server and WAP gateway supports MMS Submit and MMS Notification/MMS Retrieval tests in an interactive environment.
Test system settings support MMS testing using loopback as well as MMS Submit and MMS Retrieval tests between different terminals.
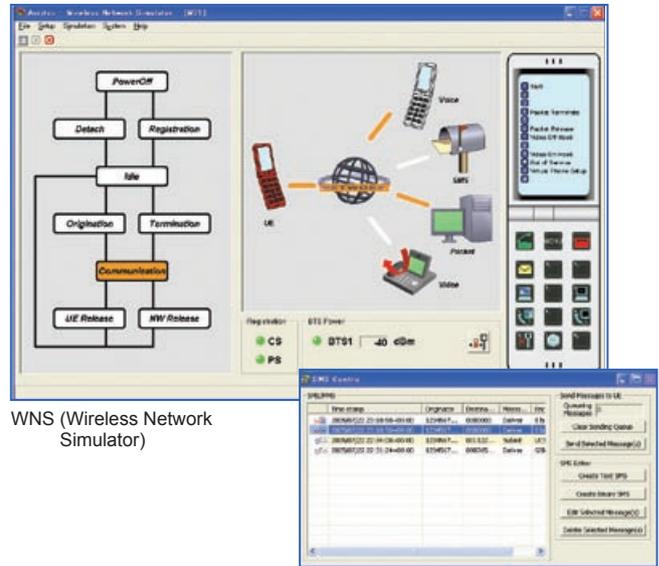
WNS (Wireless Network Simulator)

SMSC (SMS Centre)

Main Functions of WNS/SMSC

Supported Bearers	W-CDMA/HSDPA[*2]/HSUPA[*3]	Voice (MO/MT), Packet (MO/MT), PPP (Built-in server) Packet (MO), Video Call [Loopback] (MO/MT), MultiCall
	GSM/GPRS/EGPRS[*4]	Voice (MO/MT), Packet (MO/MT)
Setup Parameters	Common	Client IP address setting, Server IP address setting, Router connection setting RF Level setting
	W-CDMA/HSDPA[*2]/HSUPA[*3]	Band setting: Band I, II, III, IV, V, VI, VII, VIII, IX, X, Not Specified Channel setting Registration Type setting Activation Time setting: Voice, Packet, Video, MultiCall Packet Window Size setting Packet Rate setting: DL64k/UL64k, DL128k/UL64k, DL384k/UL64k, DL384k/UL128k, DL384k/UL384k, DL1.8M/UL384k, DL3.6M/UL384k, DL7.2M/UL384k, DL10.2M/UL384k, DL14.4M/UL384k, DL HS-Auto/UL384k, DL1.8M/UL1.46M, DL3.6M/UL1.46M, DL7.2M/UL1.46M, DL10.2M/UL1.46M, DL14.4M/UL1.46M, DL1.8M/UL2.0M, DL3.6M/UL2.0M, DL7.2M/UL2.0M, DL10.2M/UL2.0M, DL14.4M/UL2.0M, DL1.8M/UL5.76M, DL3.6M/UL5.76M, DL7.2M/UL5.76M, DL10.2M/UL5.76M, DL14.4M/UL5.76M, DL HS-Auto/UL HS-Auto Video Phone setting: ISDN/Loopback

	GSM/GPRS/EGPRS[*4]	Frequency Band setting: GSM450, GSM480, GSM850, P-GSM900, E-GSM900, R-GSM900, DCS1800, PCS1900, ARFCN (CCH, TCH)
		Slot setting: DL1/UL1, DL1/UL3, DL1/UL4, DL2/UL1, DL2/UL3, DL3/UL1, DL4/UL1, DL1/UL2, DL2/UL2, DL3/UL2
		GPRS Coding Scheme setting: CS1, CS2, CS3, CS4
		EGPRS Modulation and Coding Scheme setting
		  DL: MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7, MCS8, MCS9
		  UL: MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7, MCS8, MCS9

	USIM	USIM Parameter setting: MCC, MNC, IMSI, Test USIM_MODE, K, RAND, AUTN, IK
Other Functions	Edit and transmission of SMS (CS/PS)/Display of received SMS (7-bit ASCII/Unicode/Binary) SMS Status Report function SMS Continuous sending function SMS External transfer function MMS Transmission/Reception function[*5] State transition diagram for call processing/CS/PS Attach status indicator BTS Output power setting by GUI (1 dB step) Emergency calling Access Class Barred (R99) (Normal/Barred/Emergency) Out-of-service setting Packet Preservation setting function RRC Status Change setting (Cell DCH ⇔ Cell FACH ⇔ Cell PCH) MO/MT (manual and auto answer) operation by virtual terminal International telephone number function Show ID/Hide ID/Unknown ID/Payphone call settings DTMF checking by tone and display	

*1: The WNS is not guaranteed to operate normally with every mobile terminal model
*2: Requires MX847010A-11 HSDPA Software
*3: Requires MX847010A-12 HSUPA Software
*4: Requires MX847010A-01 EGPRS Software
*5: Requires separate MMS application server

Simple End-to-End UE Test Environment

CNS: Couple-UE Network Simulator

By using the Couple-UE Network Simulator (CNS)[*1] and additional hardware options, one MD8470A unit supports the network simulation required for voice and video calls and SMS/MMS transfer between two mobile terminals (even different operators.)[*2] Previous testing required two MD8470A units, but this CNS offers a space-saving solution with just one MD8470A, helping efficient development of mobile terminal applications.
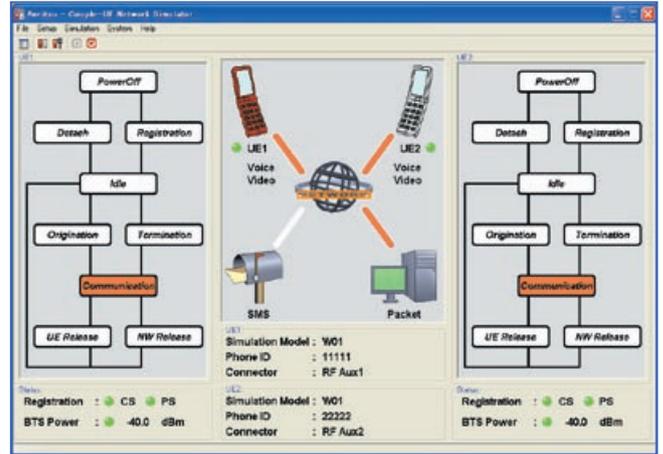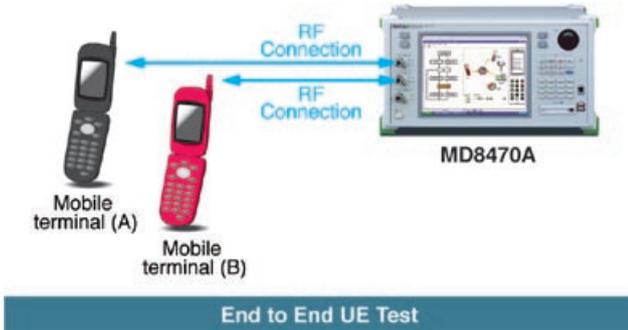
CNS (Couple-UE Network Simulator)

CNS (Couple-UE Network Simulator) End-to-End UE Tests

	Required Hardware	Supported End-to-End UE Tests
W-CDMA End-to-End UE Test	MD8470A-02 : Second RF Option MU847010B : W-CDMA Signalling Unit x 2	End-to-End voice call test End-to-End video call test End-to-End SMS/MMS[*3] test
GSM End-to-End UE Test	MD8470A-02 : Second RF Option MU847020B : GSM Signalling Unit x 2	End-to-End voice call test End-to-End SMS/MMS[*3] test
W-CDMA/GSM End-to-End UE Test	MD8470A-02 : Second RF Option MU847010B : W-CDMA Signalling Unit MU847020B : GSM Signalling Unit	End-to-End SMS/MMS[*3] test

*1: Requires Version 4.00 or later MX847010A W-CDMA/GSM Simulation Kit
*2: The CNS is not guaranteed to operate normally with every mobile terminal model
*3: Requires separate MMS application server

Simulation Control by Scenarios

W-CDMA, GSM/GPRS/EGPRS Execution and Analysis of Simulations

The MD8470A Signalling Tester runs simulations by loading edited and compiled scenarios into the dedicated control software and executing them. The information controlled during simulations, protocol messages, and user data exchanged between the mobile terminal under test and MD8470A are logged in real time. After the test, simulation results can be analyzed using the protocol message decode function (RRC, NAS [RR, CC, MM, GMM, SM], SMS, SS [Supplementary Service], Config) and filtering function.
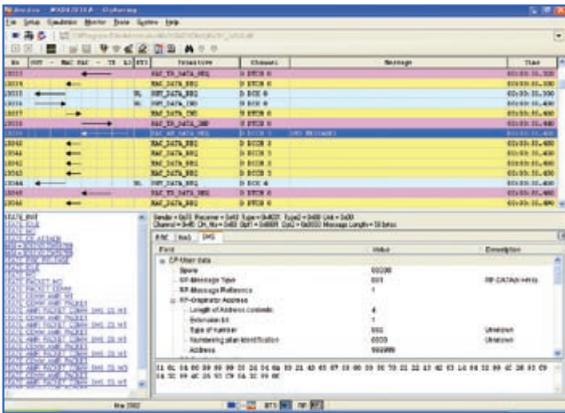
Simulation Control Software

Control Software Support Functions

Function	Description
Scenario Execution	Reads and executes compiled DLL scenarios
Real-time Trace	Displays signalling messages and user data during simulation in real time
Trace Log Save/Load	Saves (Binary/Text/Packet/H.245/Throughput) and recalls (Binary only) traced log data
Trace Display Filtering	Displays trace filtered by channel and primitive classification
Message Decode and Analysis	Translates and displays traced messages (RRC, NAS*, SMS, SS, Config)
Scenario Library Function	Provides C library function for scenario creation
External Control Function	Provides DLL library allows external application to control MX847010A control software

*: Supports RR, CC, MM, GMM, and SM

Effective Scenario Creation

Protocol Message Encoder/Decoder Tools (Message Coder)

The Message Coder is a protocol message encoder/decoder tool supporting RRC, NAS (RR, CC, MM, GMM, SM), SMS, and SS (Supplementary Service)., making creation of protocol messages for test scenarios more efficient.

Message Coder

Message Encoder/Decoder Library

A protocol message encoder/decoder library supporting RRC, NAS (RR, CC, MM, GMM, SM), SMS, and SS (Supplementary Service) is provided to simplify changing or extracting message information elements in test scenarios. The information elements are designated using the tree structure shown in the decode results of the Message Coder. This feature can be used for conditional branch processing in the scenario or analysis of received messages.

MX847010A-11 HSDPA Software
MX847010A-12 HSUPA Software

Testing Application Functions Using HSDPA/HSUPA

Global mobile communications markets are increasingly adopting 3G technologies and 3.5G mobile communication systems supporting high-speed packet data transmission. Since HSDPA/HSUPA systems offer much faster data download speeds, the performance of mobile terminals must be verified in environments with high-speed packet data rates. The MD8470A Signalling Tester with MX847010A-11 HSDPA Software*, MX847010A-12 HSUPA Software* and MU847010B W-CDMA/HSPA Signalling Unit* supports HSDPA/HSUPA communication systems. Functional testing of applications using HSDPA/HSUPA packet data communications is performed by connecting to a server.

∗: Requires Version 6.00 or later of MX847010A W-CDMA/GSM Simulation Kit

Supports All UE Categories

New hardware supports high-speed HSDPA/HSUPA BTS functions for all UE categories specified in 3GPP Release5 and Release6 with processing power for verifying data throughput performance.

3GPP TS25.306 Categories
HSDPA

HS-DSCH Category	HS-DSCH Codes	Minimum Inter-TTI	TB-Sizes	Total Number of Soft Channel Bits	Modulation	Maximum Throughput [bps]
1	5	3	7298	19200	QPSK/16QAM	1216333
2	5	3	7298	28800	QPSK/16QAM	1216333
3	5	2	7298	28800	QPSK/16QAM	1824500
4	5	2	7298	38400	QPSK/16QAM	1824500
5	5	1	7298	57600	QPSK/16QAM	3649000
6	5	1	7298	67200	QPSK/16QAM	3649000
7	10	1	14411	115200	QPSK/16QAM	7205500
8	10	1	14411	134400	QPSK/16QAM	7205500
9	15	1	20251	172800	QPSK/16QAM	10125500
10	15	1	27952	172800	QPSK/16QAM	13976000
11	5	2	3630	14400	QPSK	907500
12	5	1	3630	28800	QPSK	1815000

HSUPA

E-DCH Category	E-DCH Codes	Minimum Spreading Factor	Support for 10 and 2ms TTI EDCH	TB-Sizes within 10ms E-DCH TTI	TB-Sizes within 2ms E-DCH TTI	Maximum Throughput [bps]
1	1	SF4	10 ms TTI only	7110	–	729600
2	2	SF4	10 ms and 2 ms TTI	14484	2798	1459200
						1459500
3	2	SF4	10 ms TTI only	14484	–	1459200
4	2	SF2	10 ms and 2 ms TTI	20000	5772	2000000
						2918500
5	2	SF2	10 ms TTI only	20000	–	2000000
6	4	SF2	10 ms and 2 ms TTI	20000	11484	2000000
						5760000

Simple Application Testing for HSDPA/HSUPA

GUI-based simulation (WNS) supports HSDPA/HSUPA application test environments. Easy-to-use GUI operation allows users to set HSDPA (1.8M, 3.6M, 7.2M, 10.2M, 14.4M, HS-Auto*), and HSUPA (1.46M, 2.0M, 5.76M, HS-Auto*) rates (See Packet Rate Setting on Page 12 for details).

∗: Rate setting determined by mobile terminal category and CQI value

MX847010A-01
EGPRS Software

Testing Application Functions Using EGPRS

The MD8470A Signalling Tester with MX847010A-01 EGPRS Software* and MU847020B GSM Signalling Unit supports GUI-based simulation (WNS) for EGPRS packet data communications, the high-speed GPRS 2.5G mobile communications system. Functional testing of applications using EGPRS packet data communications is performed by connecting to a server.

∗: Requires Version 4.00 or later of MX847010A W-CDMA/GSM Simulation Kit

MX847010A-01 EGPRS Software Specification

Layer 1	Frequency Bandwidth	850, 900, 1800, 1900 MHz
	Modulation & Coding Scheme	MCS 1, 2, 3, 4 (GMSK) MCS 5, 6, 7, 8, 9 (8PSK)
	Number of Slots	Up to Multi Slot Class 12 (DL: 4 / UL: 4 / SUM: 5)
	Channel Combination	Combination 11 & 13
Layer 2, 3	Broadcasting Control Channel	BCCH/CCCH, PBCCH/PCCH
	ARQ Type	Type 1
	Window Size	64 to 192
Standard		3GPP Release99

MX847015A
Energy Management Test Simulator

Evaluating Mobile UE Battery Life at Continuous Standby and Talk

MX847015A Energy Management Test Simulator (ETS)

The MX847015A Energy Management Test Simulator (ETS) is a software application that runs on the MD8470A to interactively simulate base station operations supporting W-CDMA/HSDPA/HSUPA and GSM/GPRS/EGPRS communications bearers. It offers a graphical user interface (GUI) to evaluate current consumption for battery life at continuous standby and talk without the need to create complex test scripts. Various network parameters related to current consumption and test conditions can be configured flexibly. When used in combination with the MX847015A-01 Parallel Phone Test Software option, the current consumption of two mobile terminals can be measured simultaneously for efficient results collection and statistical analyses.
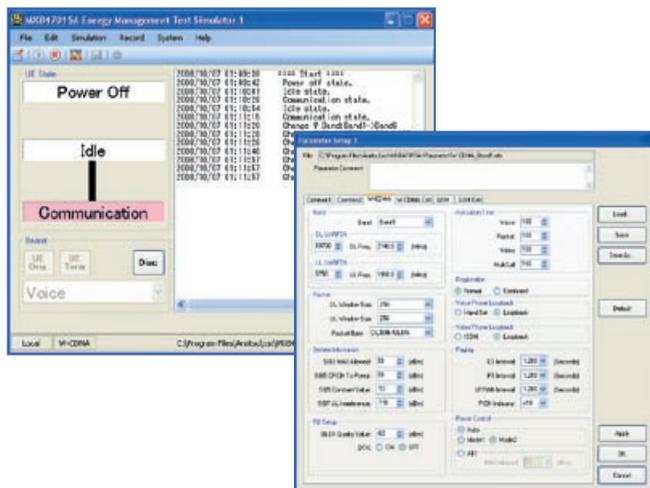
Energy Management Test Simulator (ETS)

Key Energy Management Test Simulator Applications

- Evaluation environment of battery life at continuous standby and talk
- Evaluation environment of battery life based on GSM Association "Battery Life Measurement Technique" reference
- Measurement environment of current consumption in multimedia-services environment using high-speed packet data
- Evaluate management software for current consumption and charging on mobile terminal
- Evaluation environment of mobile terminal thermal heating at max. Uplink power transmission

For details of this option, refer to the MX847015A catalog.

MX847016A
Multi-cell Network Simulator

Mobile Service Quality and Call Connectivity Tests during Handover

MX847016A Multi-cell Network Simulator (MNS)

The MNS software application runs on the MD8470A to simulate an interactive 2-Cell environment. Since the bearer starts in accordance with requests from the mobile terminal connected to the MD8470A, call processing for each service type is achieved easily in a 2-Cell environment. Tests of handover as the mobile terminal moves between cells as well cell selection and reselection to register with a suitable cell can be performed. The GUI-based operations can set various network and communication parameters flexibly using system configuration setting for two base stations, cell parameter setting for up to 10 cells and test condition setting for cell switching.
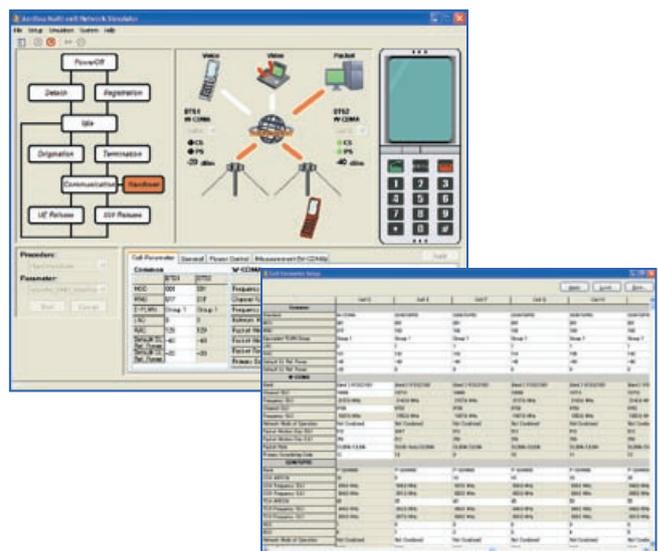
Multi-cell Network Simulator (MNS)

Key Multi-cell Network Simulator Applications

- Verify mobile terminal service quality and call connectivity at handover
- Verify roaming services between national carriers
- Perform pre-verification before field tests
- Perform comprehensive verification at integration tests of UMTS mobile terminal
- Evaluate throughout performance at switching between cells supporting different data rates, as well as mobile terminal user interface (UI)
- Verify call connectivity by simulating various carrier networks

For details of this option, refer to the MX847016A catalog.

Application Test Examples

Voice Call Testing (Handset/Loopback)

Voice Call Testing

Voice call testing can be performed between the mobile terminal and a handset by connecting a handset to the MD8470A and using a Wireless Network Simulator (WNS). Voice call testing can also be performed by voice data loopback using scenario simulation. A sample scenario is provided for voice data loopback testing.

Emergency Call Testing

Emergency call testing (with/without TEST SIM) is supported. An emergency call can be executed by calling from the mobile terminal and "Emergency" is displayed on the WNS Virtual Phone. Emergency calling can be tested in the restricted Access Class status supported by Release 99 using the Access Class Control settings.

Access Class Control

Access Class Control	
Normal	No access restrictions
Barred	Bars all calls
Emergency	Bars all calls excluding Emergency calls

Caller ID Setting

Each caller ID can be set for voice calling from the WNS Virtual Phone to the mobile terminal.

Phone ID Setting	
ID	Sets Virtual Phone number
International	Sets international phone calling
Show ID	Sets caller ID notification
Hide ID	Sets hide caller ID
Unknown ID	Sets unknown caller ID
Payphone	Sets payphone calling

Voice Call Testing (End-to-End UE Test)

End-to-End Voice Call Testing using One MD8470A Unit

By using the CNS (Couple-UE Network Simulator), one MD8470A unit supports End-to-End voice call testing.*
End-to-End UE testing is supported by GUI-based setting.

∗: For the required hardware, see CNS End-to-End UE tests on page 6
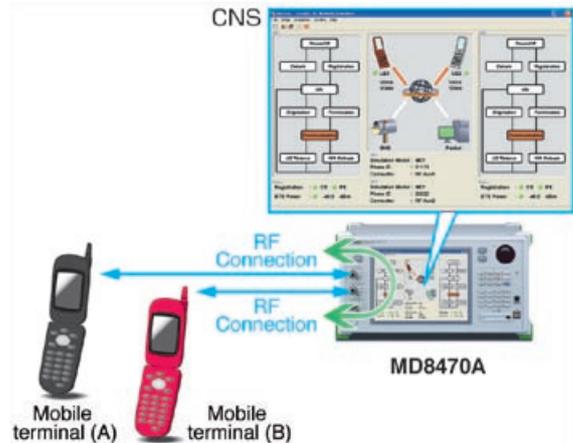
End-to-End Voice Call Testing using Two MD8470A Units

End-to-End voice call testing can also be performed by connecting two MD8470A units with a crossover Ethernet cable.*

∗: End-to-End UE testing using two MD8470A units is supported by sample scenarios
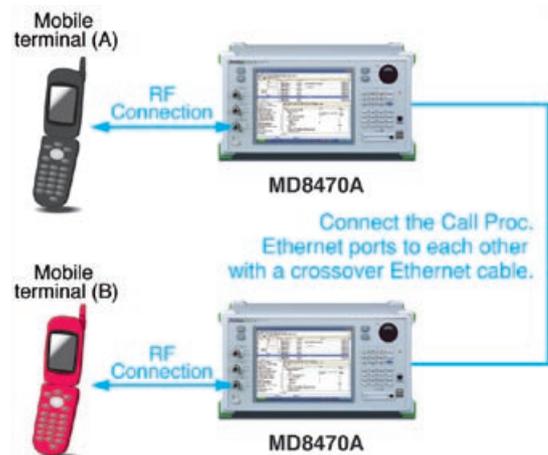
Video Call Testing (Loopback)

Video Call Testing

Video call testing can be performed without using an external video terminal by video data loopback within the MD8470A. The ability to save H.245 control protocol trace data during video calls supports offline analysis of H.245 protocol message logs.

Caller ID Setting

Caller ID can be set for video loopback calling from the WNS Virtual Phone to the mobile terminal.

Phone ID Setting	
ID	Sets Virtual Phone number
International	Sets international phone calling
Show ID	Sets caller ID notification
Hide ID	Sets hide caller ID
Unknown ID	Sets unknown caller ID
Payphone	Sets payphone calling

Video Call Testing (End-to-End UE Test)

End-to-End Video Call Testing using One MD8470A Unit

By using the CNS, one MD8470A unit supports End-to-End video call testing* using GUI-based settings.
∗: For the required hardware, see CNS End-to-End UE tests on page 6

End-to-End Video Call Testing using Two MD8470A Units

End-to-End video call testing can also be performed by connecting two MD8470A units with a crossover Ethernet cable.*

∗: End-to-End UE testing using two MD8470A units is supported by sample scenarios

Packet Communication Testing

Packet Communication Testing

Application functions that use packet communication can be tested on a single platform by installing the application server in the MD8470A's built-in PC. (Application servers can also be connected externally.)
Furthermore, the user trace data can be saved when a packet communication test is performed.

WNS

Mobile terminal

RF Connection

MD8470A

Server Connection Example

Using application server installed in MD8470A built-in PC

Connect Call Processsing Ethernet to Ethernet (0 or 1) of MD8470A built-in PC

Using external application server

Application server

Call Proc. Ethernet

Router Setting

The MD8470A's router connection function supports packet transmission to a different subnet via a router.

Mobile terminal
1.3.0.2
255.255.0.0

RF Connection

MD8470A

Ethernet

HUB

Connectable

Router

1.3.0.1
255.255.0.0

1.4.0.1
255.255.0.0
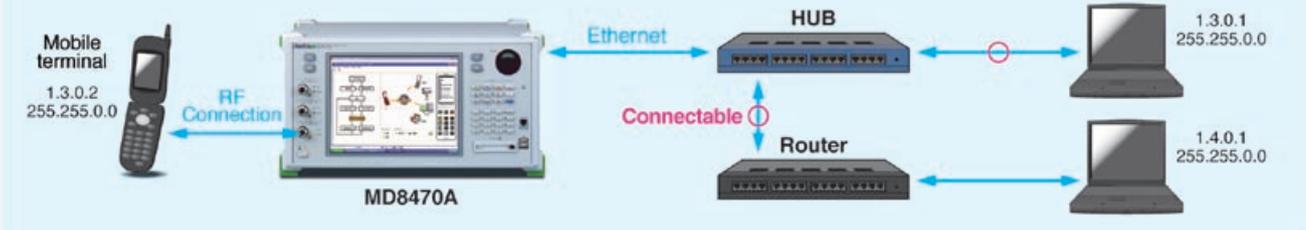
Packet Rate Setting

Using WNS supports setting of the W-CDMA/HSDPA/HSUPA Packet Rate at the test start.
Packet communication testing can be performed for each bearer environment.
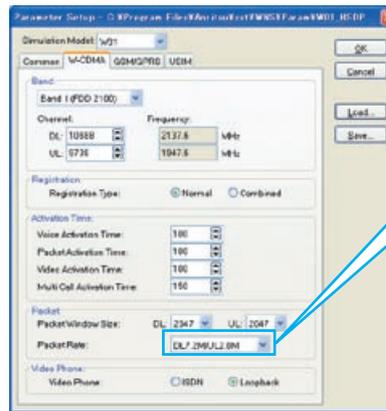
Packet Rate Setting
DL: 64k / UL: 64k
DL: 128k / UL: 64k
DL: 384k / UL: 64k
DL: 384k / UL: 128k
DL: 384k / UL: 384k
DL: HS-Auto / UL: 384k
DL: 1.8M / UL: 384k
DL: 3.6M / UL: 384k
DL: 7.2M / UL: 384k
DL: 10.2M / UL: 384k
DL: 14.4M / UL: 384k
DL: HS-Auto / UL: HS-Auto
DL: 1.8M / UL: 1.46M
DL: 1.8M / UL: 2.0M
DL: 1.8M / UL: 5.76M
DL: 3.6M / UL: 1.46M
⋮
DL: 10.2M / UL: 5.76M
DL: 14.4M / UL: 5.76M

Packet Preservation Function

The Packet Preservation function (releases RRC connection while maintaining PDP Context) is supported by specifying the network using the WNS Virtual Phone.

Packet Preservation
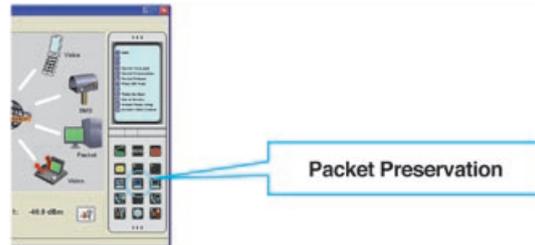
RRC Status Change Function

This function changes the mobile terminal RRC Status when no data packets are being exchanged over the network during packet communications. It can be used to establish a test environment closely emulating a live network for testing applications using packet data.

Cell DCH ⇄ Cell FACH ⇄ Cell PCH
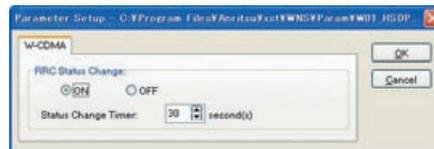
RRC Status Change

Packet Communication Testing (Multiple PDP Context)

Multi-session Packet Communications Support

The Multiple PDP Context is supported in scenario-based W-CDMA and GPRS/EGPRS* testing, enabling service interruption tests for packet-based communications, such as video streaming, web browsing, MMS. This supports the trend towards packet multi-session communications driven by increasingly popular data communications.

∗: Requires EGPRS software option (MX847010A-01)

Multiple PDP Context Support Functions

- The Multiple PDP Contexts listed below are supported for W-CDMA and GPRS/EGPRS*
  – Primary PDP Context
  – Primary PDP Context + Primary PDP Context
  – Primary PDP Context + Secondary PDP Context

- The following resources are allocated to each PDP Context
  – W-CDMA: DTCH for each separate Logical Channel Number (8PDP max.)
  – GPRS/EGPRS: Each separate NSAPI (8 types max.)

- Each PDP Context is identified using the following information
  – IPv4 Source Address Type (Server IP address)
  – IPv6 Source Address Type (Server IP address)
  – Protocol Identifier / Next Header Type (IP higher-layer protocol)
  – Single Destination Port Type (Destination port number of service)
  – Destination Port Range Type (Destination port number range of service)
  – Single Source Port Type (Source port number of service)
  – Source Port Range Type (Source port number range of service)

The above settings are made by scenarios using supplied library functions.

∗: Requires EGPRS Software option (MX847010A-01)

Data Throughput Measurement

IP Performance Monitor, MAC-hs/e Performance Monitor

The new built-in IP Performance Monitor* function supports real-time monitoring of data throughput performance. Actual data throughput can be verified at a fixed rate or at a rate determined by UE category and CQI value in HSDPA.

∗: Requires Version 6.00 or later of MX847010A W-CDMA/GSM Simulation Kit

IP Performance Monitor

Measure Function (Layer 1/Layer 2)

Measured values indicating the performance of Layer 1 and Layer 2 communications can be displayed using the Measure function. The throughput of Layer 1 and Layer 2 can be monitored in real time during testing, and functions for displaying ACK, NACK, DTX, and CQI values are built-in. Use in combination with the IP Performance Monitor function supports efficient troubleshooting and fault isolation when testing data communications. In addition, the Measure function saves collected data in .csv format for later offline analysis and reporting using spreadsheet software.

Measure Function (Layer 1/Layer 2)

SMS Testing

SMS Testing

Using the SMSC (SMS Centre) software to simulate SMS (Short Message Service) supports SMS transmission/reception and SMS loopback tests. The SMSC software has a simple GUI for creating and sending text SMS (7-bit ASCII, Unicode) and binary SMS messages. The GUI also supports checking the content of messages received from mobile terminal.
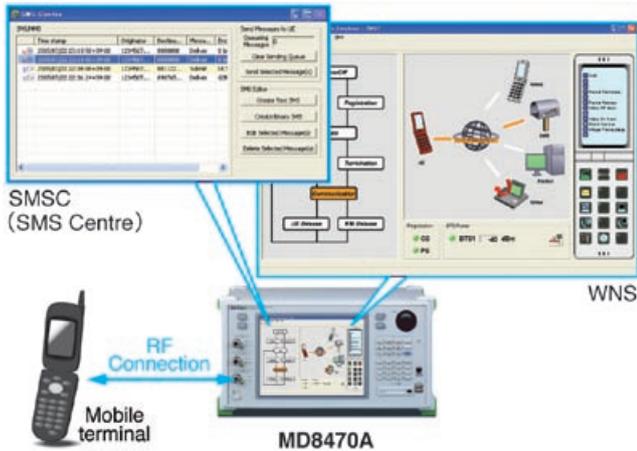
SMS Status Report Function

This function supports sending of SMS messages requesting SMS-STATUS-REPORT from a mobile terminal. In addition, the contents of the received report message (SMS-STATUS-REPORT) can be checked and edited in the Status Report Editor window.

Status Report Editor

Continuous SMS Sending Function

The Continuous Delivery Setup function supports continuous delivery of multiple messages from the SMSC to the mobile terminal in a single procedure.
This function allows users to perform message memory full and stress testing by a simple operation.
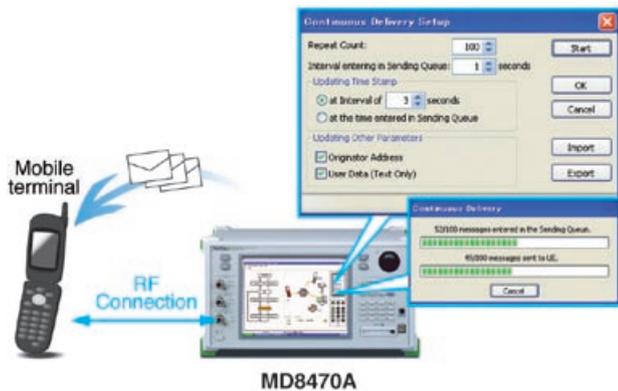
SMS External Interface

SMS Reception Interface
Using the SMS reception interface supports SMS sending from an external application. When used in combination with an external application, both WAP Push and MMS tests are supported.

SMS Forward Interface
This supports auto-sending of an SMS message from a mobile terminal to an external application meeting the conditions for the received SMS destination address, permitting SMS data management at the external application as well as automatic testing.

SMS Testing (End-to-End UE Test)

End-to-End SMS Testing using One MD8470A Unit

By using the CNS, one MD8470A unit supports the End-to-End SMS test with GUI-based setting. It is also possible to perform End-to-End SMS testing between mobile terminals of different systems∗. (W-CDMA and GSM).

∗: For the required hardware, see CNS End-to-End UE tests on page 6
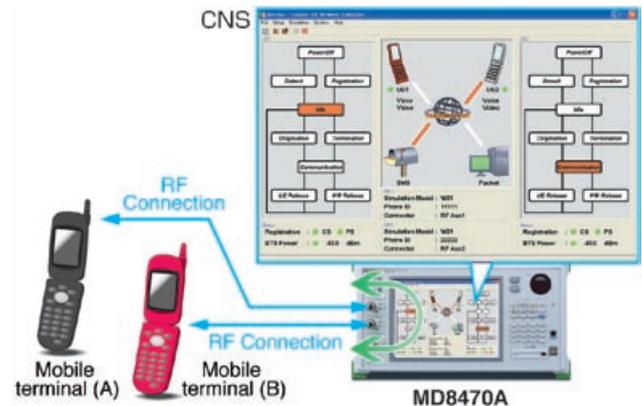
Cell Broadcast SMS Testing

GSM Cell Broadcast SMS Testing (SMSCB)

The SMSCB can be sent using the CBC (Cell Broadcast Centre) application and sample scenario for CBC. Various SMSCB tests are supported by setting transmission interval, number of retransmission times and various other parameters.
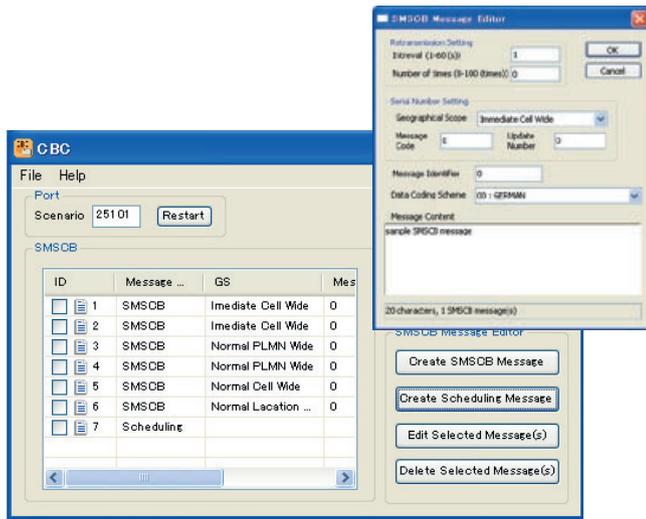
CBC (Cell Broadcast Centre)

W-CDMA Cell Broadcast SMS Testing (BMC)

W-CDMA Cell Broadcast is supported by sample scenario, and a library function for sending the scenario-edited Schedule Message and CBS Message has been added.

MMS Testing

MMS Testing using Application Server

Combining the separate MMSC (MMS Centre) application server*
and SMSC (SMS Centre) supports testing of the MMS Submit and
MMS Notification/MMS Retrieval functions. Additionally, when the
MMSC software is installed in the MD8470A, MMS testing can be
performed on one unit.

*: Requires separate MMS application server
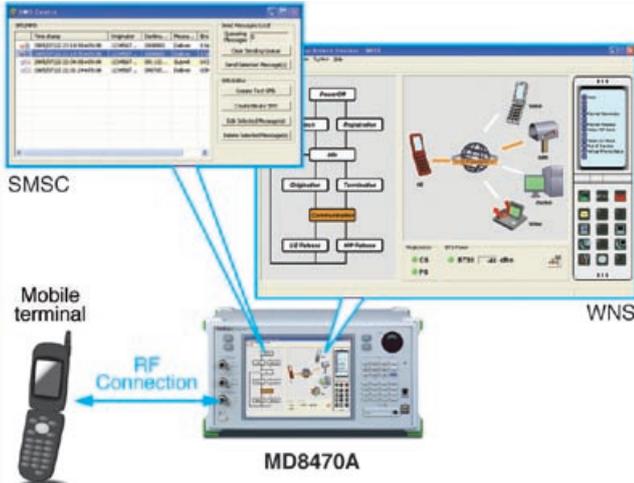
MMS Testing (End-to-End UE Test)

End-to-End MMS Testing using One MD8470A Units

By using the CNS, one MD8470A unit supports End-to-End MMS[1]
test[2] with GUI-based setting.
It is also possible to perform End-to-End MMS testing between
mobile terminal of different systems[2] (W-CDMA and GSM/GPRS).

*1: Requires separate MMS application server
*2: For the required hardware, see CNS End-to-End UE tests on page 6
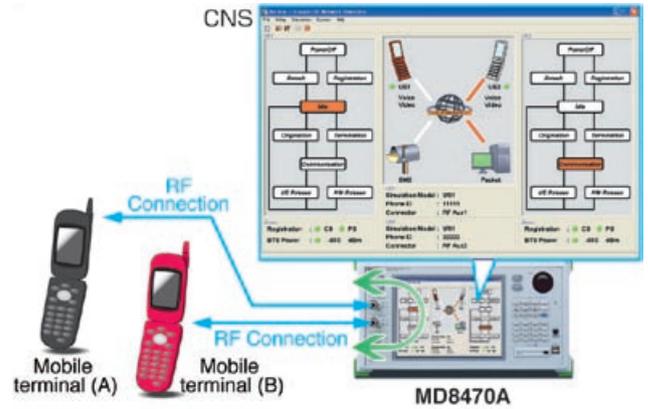
End-to-End MMS Testing using Two MD8470A Units

End-to-End MMS testing can also be performed by connecting two
MD8470A* units and End-to-End MMS testing between mobile
terminal of different systems (W-CDMA and GSM/GPRS) is also
supported.

*: MMS Centre must be installed in one of the two MD8470A units
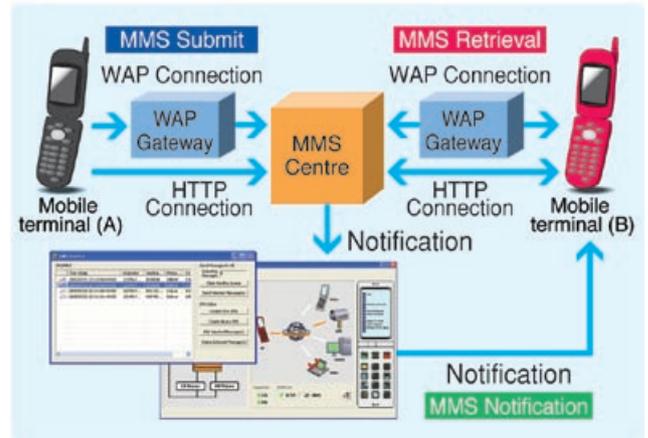
Service Interruption Testing (Multi-Call)

Service Interruption Testing

The behavior of applications during service interruptions can be evaluated by using WNS to simulate interactive base station operations such as incoming voice or video calls during packet communication, or SMS/MMS reception during voice calls, video calls, or packet communication.

Service Interruption Test Examples (W-CDMA/HSDPA/HSUPA UE)

Status \ Interruption	Voice Call Interruption	Video Call Interruption	SMS Interruption	MMS Interruption
During Voice Call			√	√
During Packet Communication*1	√	√	√	√
During Video Call			√	√

√: Testable

*1: Requires HSDPA Software option (MX847010A-11) for HSDPA and HSUPA Software option (MX847010A-12) for HSUPA

Service Interruption Test Examples (GSM/GPRS/EGPRS UE)

Status \ Interruption	Voice Call Interruption	SMS Interruption	MMS Interruption
During Voice Call		√	√
During Packet Communication*2	√*3	√*3	√*3

√: Testable

*2: Requires EGPRS Software option (MX847010A-01) for EGPRS
*3: Only when packet data not transmitted

Service Interruption Testing (End-to-End UE Test)

End-to-End UE Service Interruption Testing

By using the CNS, one MD8470A unit supports various service interruption tests depending on the End-to-End test environment, such as voice call termination from another mobile terminal during IP packet communication*.

*: For the required hardware, see CNS End-to-End UE tests on page 6

Service Interruption Test Examples (W-CDMA/HSDPA/HSUPA UE ⇔ W-CDMA/HSDPA/HSUPA UE)

Status \ Interruption	Voice Call Interruption	Video Call Interruption	SMS Interruption	MMS Interruption
During End-to-End Voice Call			√	√
During Packet Communication*1	√	√	√	√
During End-to-End Video Call			√	√

√: Testable

*1: Requires HSDPA Software option (MX847010A-11) for HSDPA and HSUPA Software option (MX847010A-12) for HSUPA

Service Interruption Test Examples (GSM/GPRS/EGPRS UE ⇔ GSM/GPRS/EGPRS UE)

Status \ Interruption	Voice Call Interruption	SMS Interruption	MMS Interruption
During End-to-End Voice Call		√	√
During Packet Communication*2	√*3	√*3	√*3

√: Testable

*2: Requires EGPRS Software option (MX847010A-01) for EGPRS
*3: Only when packet data not transmitted
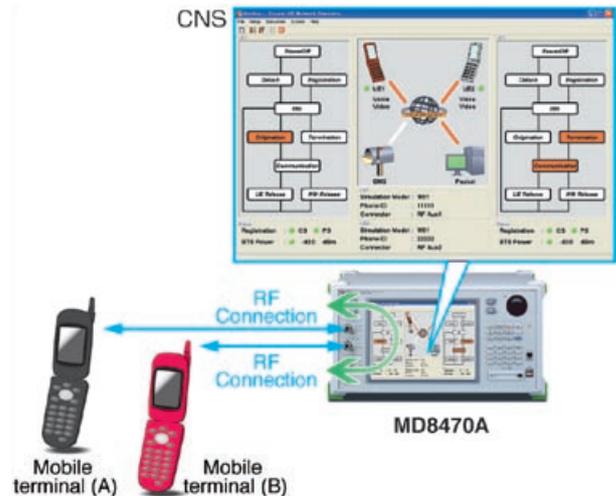
Service Interruption Testing (DTM: Dual Transfer Mode)

GSM/GPRS/EGPRS Multicall Support

This function supports simultaneous scenario-based Dual Transfer Mode (DTM) testing for both GSM (CS: Voice) and GPRS (PS: packet communications)∗. And adding the MX847010A-01 EGPRS Software option supports DTM testing for GSM (CS) + EGPRS (PS). Moreover, the operation of application using packet communication during voice calling can be verified.

∗: DTM Testing requires the MU847020B GSM Signalling Unit
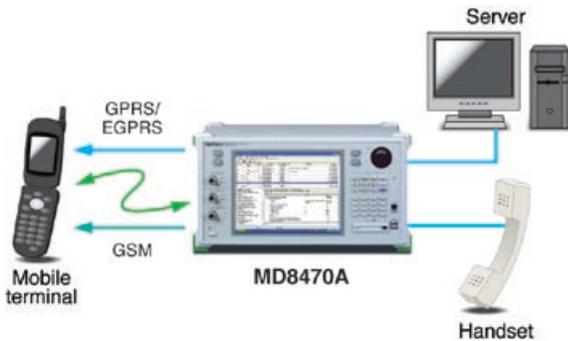
DTM Support Functions

Item	Feature	Specification
Layer 1	CS/PS Frequency	Supports same frequency only (CS/PS)
	Transmission Power Setting	Sets separate CS and PS
	Slot Operation	Supports Multislot only (Single slot not supported)
	DTM Multislot Class	5, 9, 11
Signalling Procedure		Supports CS ⇔ CS + PS, PS ⇔ PS + CS
EGPRS Capability		Supports GSM (Voice) + EGPRS (Packet)∗
Reference version for 3GPP		3GPP Release99

∗: Requires EGPRS Software option (MX847010A-01)

Cell Selection, Reselection & Handover Tests

The MX847016A Multi-cell Network Simulator performs cell selection, reselection and handover tests. In addition to roaming verifications when moving between different national carriers, the MNS can also verify the quality of high-speed packet-based multimedia services by installing the MX847010A-01 EGPRS Software, MX847010A-11 HSDPA Software, and MX847010A-12 HSUPA Software options. Since one MD8470A with these software options closely emulates the real service environment, it greatly improves the work efficiency at pre-verification of field tests.

W-CDMA/HSDPA/HSUPA (2-Cell)

- Cell Selection
- Cell Reselection
- Handover
    Soft Handover
    Inter-frequency Hard Handover
    Intra-frequency Hard Handover
        Voice Call (AMR: Handset, Loopback)
        Video Call (Loopback)
        Packet Call (DL384k/UL64k to DL7.2M/UL2.0M)
        Multi-call (Voice + Packet, Video + Packet)

GSM/GPRS/EGPRS (2-Cell)

- Cell Selection
- Cell Reselection
- Inter-frequency Hard Handover
    Voice Call (EFR/FR∗/HR∗/AMR: Handset, Loopback)
    Packet Call (GPRS, EGPRS)

∗: FR/HR only support Loopback

W-CDMA/HSDPA/HSUPA, GSM/GPRS/EGPRS (2-Cell/InterRAT)

- Cell Selection
- Inter-system Cell Reselection
- Inter-system Handover
    Voice Call∗ (W-CDMA ⇔ GSM)
    Packet Call
    (W-CDMA/HSDPA/HSUPA ⇔ GSM/GPRS/EGPRS)

∗: Voice call only support Loopback

For details of this option, refer to the MX847016A catalog.

Evaluating Mobile Terminal Battery Life

MX847015A Energy Management Test Simulator

The MX847015A Energy Management Test Simulator (ETS) sets network parameters related to current consumption for evaluating the mobile terminal's battery life at continuous standby and talk time. It performs the battery current consumption test by executing periodic location area update. Additionally, Anritsu's unique Parallel Phone test system allowing two mobile terminals to be tested simultaneously supports efficient collection and statistical analysis of high-accuracy current consumption results.

High Test Efficiency using Parallel Phone

MX847015A-01 Parallel Phone Test Software for ETS

Adding the MX847015A-01 Parallel Phone Test Software option and the required hardware supports independent battery life evaluation environment of two mobile terminals connected to one MD8470A. Because two models can be tested for long-term periods under various conditions such as continuous standby and talk at each frequency band, productivity is doubled, raising testing efficiency to new levels.
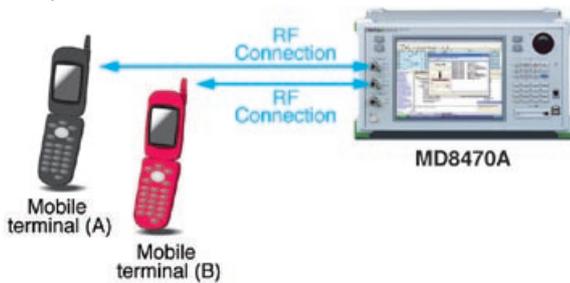
MX847015A-01 Parallel Phone Test Software for ETS

Example of Mobile Terminal Current Consumption Measurement System

The MX847015A supports remote control over the common GPIB standard, permitting easy configuration of an automated test system combining an external PC, MD8470A, multi-meter and power supply.

∗: Customer's equipment

For details of this option, refer to the MX847015A catalog.
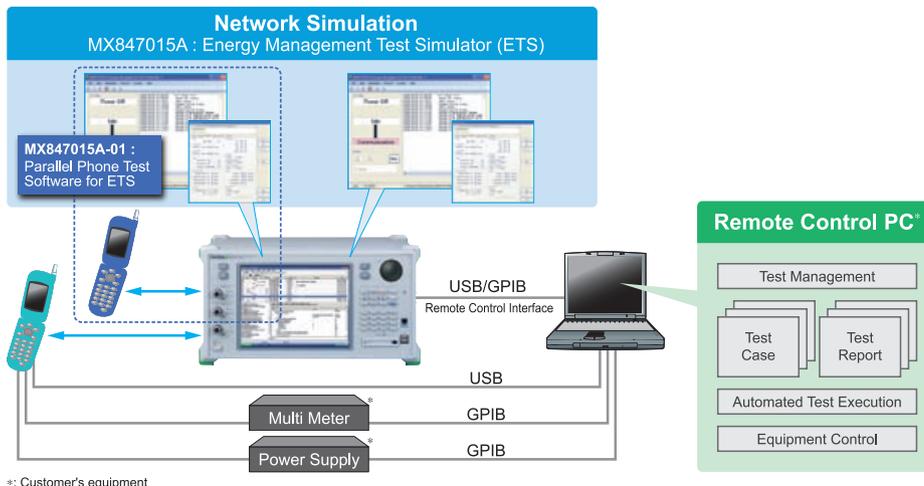
Panel Layout

1 Power switch
Switches mode between power-on (On) and standby (Stby)

2 [RF Main] Main input/output connector
Main N-type input/output connector

3 [RF Aux1] Aux1 input/output connector
Auxiliary N-type input/output connector

4 [RF Aux2] Aux2 input/output connector
Auxiliary N-type input/output connector

5 Left key
Performs same operation as left mouse click

6 Right key
Performs same operation as left mouse click

7 [Pointer] Pointer
Moves screen pointer

8 Cursor key
Performs same operation as keyboard cursor key

9 Enter key
Performs same operation as keyboard Enter key

10 Off-Hook key
Performs same Off-Hook operation as Shift + Ctrl + F1 on keyboard

11 On-Hook key
Performs same On-Hook operation as Shift + Ctrl + F2 on keyboard

12 Previous key
Moves cursor to item before current selection in same operation as Shift + Tab on keyboard

13 Next key
Moves cursor to item after current selection in same operation as Tab on keyboard

14 Help key
Displays on-screen Help window in same operation as F1 on keyboard

15 Keyboard key
Displays on-screen keyboard

16 Extender key
Changes keyboard key functions to descriptions in blue while key lamp lit

17 BackSpace key
Deletes previous letter in same operation as BackSpace on keyboard

18 Ten keys
Input numeric values for parameters and A to F in hexadecimal

19 [HDD] Hard disk access lamp
Lights during main-frame HDD access

20 [Handset] Handset connector
Handset (standard accessory) connector

21 [USB] USB connector
USB connector for USB1.1 devices

22 [PCMCIA] PCMCIA slot
Slot for Type I or II PCMCIA memory card
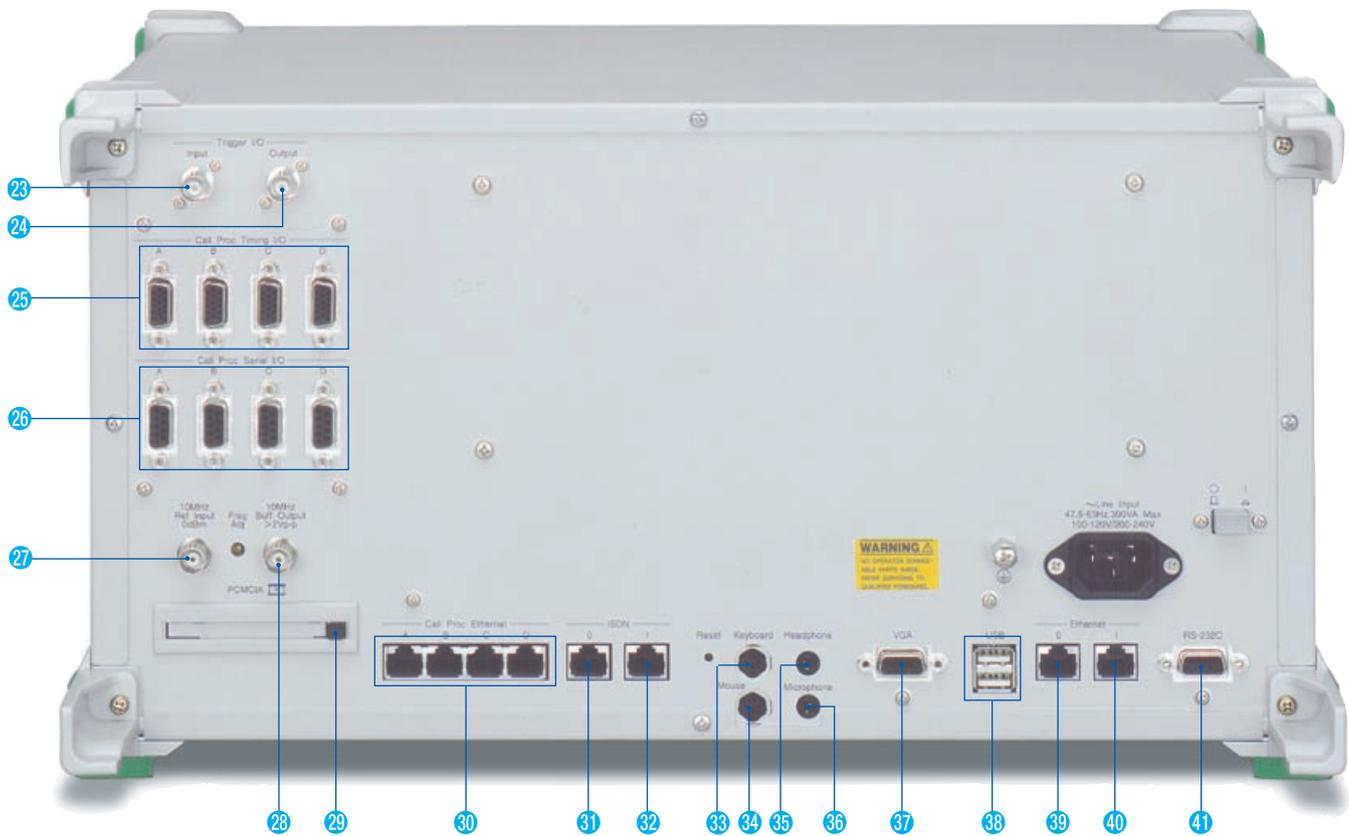
㉓ [Trigger I/O Input] Trigger input connector
Reserved

㉔ [Trigger I/O Output] Trigger output connector
Reserved

㉕ [Call Proc Timing I/O A to D] Timing input/output port for call processing
Reserved

㉖ [Call Proc Serial I/O A to D] Serial input/output port for call processing
D-sub 9-pin connector for call processing

㉗ [10 MHz Ref Input] Reference signal input connector
BNC connector for external reference signal input

㉘ [10 MHz Buff Output] Reference signal output connector
BNC connector for built-in reference signal output

㉙ [PCMCIA] PCMCIA slot
Slot for Type I or II PCMCIA memory card

㉚ [Call Proc Ethernet A to D] Ethernet input/output port for call processing
RJ-45 connector and Ethernet port for call processing for packet communications

㉛ [ISDN 0] ISDN 0 port
RJ-45 connector for ISDN for video call test (BRI) <Option>

㉜ [ISDN 1] ISDN 1 port
Reserved

㉝ [Keyboard] Keyboard
Keyboard connector (standard accessory)

㉞ [Mouse] Mouse
Mouse connector (standard accessory)

㉟ [Headphone] Headphone
Headphone connector for 3.5-mm mini-jack

㊱ [Microphone] Microphone
Microphone connector for 3.5-mm mini-jack

㊲ [VGA] VGA connector
Mini D-sub 15-pin connector for external monitor

㊳ [USB] USB connector
USB connector for USB 2.0/1.1 devices

㊴ [Ethernet 0] Ethernet 0 port
Ethernet port for built-in PC

㊵ [Ethernet 1] Ethernet 1 port
Ethernet port for built-in PC

㊶ [RS-232C] RS-232C port
D-sub 9-pin connector for external PC

㊷ Main power switch
Switches main power on and off; front-panel Power switch enters Stby mode while main power on

Supported Functions

W-CDMA/HSDPA/HSUPA Test Functions

MU847010B W-CDMA/HSPA Signalling Unit and MX847010A W-CDMA/GSM Simulation Kit are required.

Function	Description	WNS	CNS	Sample Scenario
Location registration		○	○	○
UE originated/terminated voice call (Loopback)	Performs loopback communication test	—	—	○
UE originated/terminated voice call (Handset)	Performs handset communication test	○	—	○
UE originated/terminated voice call (End-to-End UE test)	Performs End-to-End voice call test between two UE	—	○	○[*1]
Emergency Call	Performs Emergency Call test with or without Test SIM	○	—	○[*2, *3]
Voice call released		○	○	○
UE originated/terminated video call (Loopback)	Performs loopback communication test	○	—	○
UE originated/terminated video call (End-to-End UE test)	Performs End-to-End video call test between two UE	—	○	○[*1]
Video call released		○	○	○
Caller ID Setting	Performs Show ID/Hide ID/Unknown ID/Payphone/International call settings	○	—	—
UE originated W-CDMA packet call	Performs application tests utilizing packet data communications by connecting to server	○[*4]	○	○[*4]
UE terminated W-CDMA packet call	Performs application tests utilizing packet data communications by connecting to server	○	—	—
W-CDMA packet call released from UE		○	○	○
W-CDMA packet call released from NW (Network)		○	—	○
UE originated HSDPA packet call	Performs application tests utilizing packet data communications by connecting to server[*5, *7]	○[*26]	○[*6]	○[*6]
UE terminated HSDPA packet call	Performs application tests utilizing packet data communications by connecting to server[*5, *7]	○[*26]	—	○[*6]
HSDPA packet call released from UE	[*5, *7]	○[*26]	○[*6]	○[*6]
HSDPA packet call released from NW	[*5, *7]	○[*26]	—	○[*6]
UE originated HSUPA packet call	Performs application tests utilizing packet data communications by connecting to server[*7, *8]	○[*27]	○[*22]	○[*2, *21]
HSUPA packet call released from UE	[*7, *8]	○[*27]	○[*22]	○[*2, *21]
HSUPA packet call released from NW	[*7, *8]	○[*27]	—	—
Packet Preservation	Releases RRC Connection while maintaining PDP Context	○		—
RRC Status Change	The mobile RRC Status can be changed during packet data communications (Cell DCH ⇔ Cell FACH ⇔ Cell PCH).	○	○	—
Multiple PDP Context	Performs Multi Session packet communications test	—	—	○
IPv6	Data supporting IPv6 can be sent and received.	—	—	△
UE originated PPP packet call	Performs PPP (Built-in server/Serial) packet data communication test	○[*9]	○[*9]	○
UE terminated PPP packet call	Performs PPP (Serial) packet data communication test	—	○	○
PPP packet call released from UE	Performs PPP (Built-in server/Serial) packet data communication test	○[*9]	○[*9]	○
PPP packet call released from NW	Performs PPP (Built-in server/Serial) packet data communication test	○[*9]	—	○
UE originated/terminated Unrestricted Digital Information	[*10]	—	—	○[*2]
Unrestricted Digital Information released from UE	[*10]	—	—	○[*2]
Unrestricted Digital Information released from NW	[*10]	—	—	○[*2]
Multi call	Performs packet and voice call test simultaneously[*11]	○	○	—
SMS transmission/reception	Performs SMS (7bit-ASCII, Unicode, Binary) test[*12]	○	○	○
SMS transmission/reception (End-to-End UE test)	Performs End-to-End SMS test between two UE	—	○	—
Continuous SMS Sending	Performs continuous sending of multiple SMS messages to UE[*12]	○	○	—
MMS transmission/reception	Performs MMS transmission/reception test[*13]	○	○	—
MMS transmission/reception (End-to-End UE test)	Performs End-to-End MMS test between two UE[*13]	○[*1]	○	—
Cell Broadcast SMS	Performs W-CDMA Cell Broadcast test	—	—	○
Supplementary service	Offers various sample scenarios of supplementary service such as Multiparty/Call waiting/USSD	—	—	○[*2]
Access Class Barred (Release99) [Barred]	Bars all calls according to Release 99 standard	○	—	—
Access Class Barred (Release99) [Emergency]	Bars all calls except emergency calls according to Release 99 standard	○	—	—
Out of service Setting	Sets BTS Power output to OFF and sets UE to outside NW condition	○	—	—
Ciphering Function Testing	Performs call processing test with W-CDMA ciphering function[*14]	—	—	△
Inter-system Handover (InterRAT)	Performs W-CDMA/HSDPA[*20] ⇔ GSM/GPRS/EGPRS[*15] Inter-RAT tests (Cell Reselection/Voice/Packet)[*16] (The W-CDMA/HSDPA/HSUPA ⇔ GSM/GPRS/EGPRS InterRAT test using the MNS easy-to-use GUI requires the MX847016A Multi-cell Network Simulator)	—	—	○
Intra-system Handover	Performs Cell Selection/Reselection and Soft Handover/Inter-frequency Hard Handover/ Intra-frequency Hard Handover (Voice/Video Call/Packet/Multi-call) tests between two W-CDMA/HSDPA[*20]/HSUPA[*23] cells[*24] (The MX847016A Multi-cell Network Simulator is required)	—	—	—

○ : Can be supported by WNS, CNS or sample scenarios
△ : Can be supported by creating scenarios

GSM/GPRS/EGPRS Test Functions

MU847020B GSM Signalling Unit and MX847010A W-CDMA/GSM Simulation Kit are required.

Function	Description	WNS	CNS	Sample Scenario
Location registration		○	○	○
UE originated/terminated voice call (Loopback)	Performs loopback communication test	—	—	○
UE originated/terminated voice call (Handset)	Performs handset communication test	○	—	○
UE originated/terminated voice call (End-to-End UE test)	Performs End-to-End voice call test between two UE	—	○	△ [1]
Emergency Call	Performs Emergency Call test with or without Test SIM	○	—	○ [2], [3]
Voice call released		○	○	○
Caller ID Setting	Performs Show ID/Hide ID/Unknown ID/Payphone/International call settings	○	—	—
UE originated GPRS packet call	Performs application tests utilizing packet data communications by connecting to server	○	○	○
UE terminated GPRS packet call	Performs application tests utilizing packet data communications by connecting to server	○	—	—
GPRS packet call released from UE		○	○	○
GPRS packet call released from NW		○	—	—
UE originated EGPRS packet call (Class 12)	Performs application tests utilizing packet data communications by connecting to server [15]	○	○	○
UE terminated EGPRS packet call	Performs application tests utilizing packet data communications by connecting to server [15]	○	—	—
EGPRS packet call released from UE	[15]	○	○	○
EGPRS packet call released from NW	[15]	○	—	—
Packet Preservation	Releases RRC Connection while maintaining PDP Context	○	—	—
Multiple PDP Context	Performs Multi Session packet communications test (GPRS/EGPRS [15])	—	—	△
IPv6	Data supporting IPv6 can be sent and received.	—	—	△
DTM (Dual Transfer Mode)	Performs Dual Transfer Mode (Class5/9/11) for GSM (CS: Voice) and GPRS/EGPRS [15] (PS: Packet communications) [17]	—	—	○
UE originated/terminated Circuit Switched Data (CSD) call	Performs GSM circuit switched data (CSD) communication test	—	—	○
Circuit Switched Data call released from UE	Performs GSM circuit switched data (CSD) communication test	—	—	○
Circuit Switched Data call released from NW	Performs GSM circuit switched data (CSD) communication test	—	—	○
SMS transmission/reception	Performs SMS (7bit-ASCII, Unicode, Binary) test [12]	○	○	○
SMS transmission/reception (End-to-End UE test)	Performs End-to-End SMS test between two UE	—	○	—
Continuous SMS Sending	Performs continuous sending of selected multiple SMS messages to UE [12]	○	○	—
MMS transmission/reception	Performs MMS transmission/reception test [13]	○	○	—
MMS transmission/reception (End-to-End UE test)	Performs End-to-End MMS test between two UE [13]	○ [1]	○	—
Cell Broadcast SMS	Performs GSM Cell Broadcast test [18]	—	—	○
Supplementary service	Offers various sample scenarios of supplementary service such as Multiparty/Call waiting/USSD	—	—	○ [2]
Access Class Barred (Release99) [Barred]	Bars all calls according to Release 99 standard	○	—	—
Access Class Barred (Release99) [Emergency]	Bars all calls except emergency calls according to Release 99 standard	○	—	—
Out of service Setting	Sets BTS Power output to OFF and sets UE to outside NW condition	○	—	—
Ciphering Function Testing	Performs call processing test using GSM/GPRS ciphering function [19]	—	—	△
Inter-system Handover (InterRAT)	Performs W-CDMA/HSDPA [20] ⇔ GSM/GPRS/EGPRS [15] Inter-RAT tests (Cell Reselection/Voice/Packet) [16] (The W-CDMA/HSDPA/HSUPA ⇔ GSM/GPRS/EGPRS InterRAT test using the MNS easy-to-use GUI requires the MX847016A Multi-cell Network Simulator)	—	—	○
Intra-system Handover	Performs Cell Selection/Reselection and Inter-frequency Hard Handover (Voice Call/Packet) tests between two GSM/GPRS/EGPRS [15] cells [25] (The MX847016A Multi-cell Network Simulator is required)	—	—	—

○ : Can be supported by WNS, CNS or sample scenarios
△ : Can be supported by creating scenarios

*1: Two MD8470A units
*2: Provided by web download service of MD8470A support service (MX847010A-20)
*3: Supported only with Test SIM
*4: Can change rate (DL: 64 kbps, 128 kbps, 384 kbps)
*5: Requires MX847010A-11 HSDPA Software option and MU847010B W-CDMA/HSPA Signalling Unit
*6: Supports HSDPA Category 6 (3.6 Mbps), Category 8 (7.2 Mbps) and Category 12 (1.8 Mbps)
*7: Supports HSDPA/HSUPA functions for all UE categories specified in 3GPP Release5 and Release6
*8: Requires MX847010A-12 HSUPA Software option and MU847010B W-CDMA/HSPA Signalling Unit
*9: Supports only PPP (Built-in server) packet data communication test
*10: Uses ISDN interface option (MU847090B)
*11: See Service Interruption Testing on Page 17 for details
*12: Uses SMSC (SMC Centre)
*13: Requires separate MMS application sever

*14: Requires W-CDMA Ciphering Software option (MX847011A)
*15: Requires EGPRS Software option (MX847010A-01)
*16: Requires MD8470A-02 Second RF Option, MU847010B W-CDMA/HSPA Signalling Unit, and MU847020B GSM Signalling Unit
*17: DTM Test requires MU847020B GSM Signalling Unit
*18: Uses CBC (Cell Broadcast Centre)
*19: Requires MX847021A GSM/GPRS Ciphering Software Option
*20: Requires HSDPA Software option (MX847010A-11)
*21: Supports HSUPA Category 5 (2.0 Mbps)
*22: Supports HSUPA Category 3 (1.46 Mbps) and Category 5 (2.0 Mbps)
*23: Requires HSUPA Software option (MX847010A-12)
*24: Requires MD8470A-02 Second RF Option, and two sets of MU847010B W-CDMA/HSPA Signalling Unit
*25: Requires MD8470A-02 Second RF Option, and two sets of MU847020B GSM Signalling Unit
*26: Supports HSDPA Category 1 to 12
*27: Supports HSUPA Category 1 to 6

Specifications

MD8470A Signalling Tester

Transmitter Characteristic	Frequency range: 400 MHz to 2700 MHz Frequency setting resolution: 100 Hz Output level range: –120 to –18 dBm (RF Main) Level setting resolution: 0.1 dB Output level accuracy: ±3 dB (Output level: ≥–50 dBm, 18 to 28˚C) Modulation accuracy: ≤7%rms (when MU847010A/B is mounted) Phase error: ≤4˚rms (when MU847020A/B is mounted)
Receiver Characteristic	Frequency range: 400 MHz to 2700 MHz Frequency setting resolution: 100 Hz Maximum input level: +34 dBm (Average) Reference setting range: –30 to +20 dBm (RF Main)
External Interface	RF Main/RF Aux1/RF Aux2: N type connector, Impedance: 50 Ω Call Proc. Serial I/O A to D: D-Sub 9-pin connector, RS-232C, Serial interface for data communications Call Proc. Ethernet A to D: RJ-45 connector, 10BASE-T, Ethernet interface for data communications ISDN 0: RJ-45 connector (Option), ISDN interface for data communications (I.430) Handset: Modular jack, Handset interface (incl. the dedicated handset)

Reference Oscillator	10 MHz Buff Output
	  Frequency: 10 MHz
	  Level: TTL level
	  Connector: BNC type
	  Startup characteristics: ≤±5 x 10^{-8} (5 minutes after power-on, reference to 24 hours after power-on)
	  Aging rate: ≤±1 x 10^{-8}/day, ±1 x 10^{-7}/year (reference to 24 hours after power-on)
	  Temperature characteristics: ≤±2 x 10^{-8}

External Reference Input	10 MHz Ref Input
	  Frequency: 10 MHz (±0.5 ppm)
	  Level: ≥0 dBm
	  Impedance: 50 Ω
	  Connector: BNC Type

Built-in Personal Computer	OS: Windows XP Professional operating system CPU: Mobile Intel Pentium 4 processor 1.7 GHz HDD: 40 GB Memory: 512 MB
User Interface	Display: Color TFT LCD monitor, 10.4 inch, XGA Headphone: 3.5-mm headphone jack Microphone: 3.5-mm microphone jack USB: USB1.1 (Front panel), USB2.0/1.1 (Rear panel) RS-232C: D-Sub 9-pin connector PCMCIA: Type I, II compliant (Front, Rear panel) Keyboard: PS/2 Mouse: PS/2 VGA: Mini D-Sub 15-pin connector Ethernet 0/1: RJ-45 connector (10BASE-T, 100BASE-TX)
Dimensions	426 (W) x 221.5 (H) x 281 (D) mm ∗Excluding protrusions
Mass	≤17 kg (when all options)
Power Supply	100 to 120 V/200 to 240 Vac (–15%/+10%, Max.: 250 V), 47.5 Hz to 63 Hz, ≤300 VA
Operating Temperature	+5˚ to +40˚C, Humidity ≤95% (no condensation)
Storage Temperature	–20˚ to +65˚C, Humidity ≤95% (no condensation)
EMC	EN61326, EN61000-3-2
LVD	EN61010-1

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• Other companies, product names and service names are registered trademarks of their respective companies.

Hardware/Software Options

Hardware

● **W-CDMA/HSPA Signalling Unit (MU847010B)**
This hardware unit simulates the operation of W-CDMA base stations.

● **GSM Signalling Unit (MU847020B)**
This hardware unit simulates the operation of GSM/GPRS base stations.

● **ISDN Interface Unit (MU847090B)**
This unit enables the ISDN interface. A video call communication test is performed with a mobile terminal under test by connecting a video call terminal to the ISDN interface.

● **Second RF Option (MD8470A-02)**
This hardware unit supports simulation using two RF signals.
It is required when running End-to-End UE tests and InterRAT testing with one MD8470A unit.

Software

● **W-CDMA/GSM Simulation Kit (MX847010A)**
This software is required for use with W-CDMA and GSM/GPRS. The kit includes libraries for scenario programming, control software for scenario execution and tracing/analysis, sample scenarios for basic call processing, and user manuals. (Microsoft Visual C++.net Standard 2003 or Microsoft Visual Studio 2005 Standard Edition* is separately required for scenario compiling. Also, in case Visual C++.net Standard 2003 or Visual Studio 2005 Standard Edition is installed in the MD8470A's built-in PC, a CD or DVD drive with a USB interface is separately required.)

∗: Version 5.00 or later of the MX847010A W-CDMA/GSM Simulation Kit is required

● **Energy Management Test Simulator (MX847015A)**
The ETS is a software application that runs on the MD8470A to interactively simulate base stations supporting the W-CDMA/HSDPA/HSUPA and GSM/GSM/EGPRS bearers. It has an easy-to-use GUI for evaluating the battery life of mobile terminals at continuous standby and talk without the need to create complex test scripts by offering flexible setting of network parameters related to current consumption and test conditions.

● **Parallel Phone Test Software for ETS (MX847015A-01)**
Adding the MX847015A-01 Parallel Phone Test Software option and the required hardware supports independent battery life evaluation environment of two mobile terminals connected to one MD8470A, offering a high-productivity test environment.

● **Multi-cell Network Simulator (MX847016A)**
The MNS software simulates interactive base station operations for a 2-Cell W-CDMA/W-CDMA, GSM/GSM, and W-CDMA/GSM environment to support cell selection, cell reselection and handover tests for each service. The easy-to-use GUI supports simple setting of network parameters without needing to create complex test scripts.

● **HSDPA Software (MX847010A-11)**
This software is required for HSDPA simulation. HSDPA testing is supported by combining the MX847010A W-CDMA/GSM Simulation Kit with the MU847010B W-CDMA/HSPA Signalling Unit.

● **HSUPA Software (MX847010A-12)**
This software is required for HSUPA simulation. HSUPA testing is supported by combining the MX847010A W-CDMA/GSM Simulation Kit with the MU847010B W-CDMA/HSPA Signalling Unit.

● **EGPRS Software (MX847010A-01)**
This software is required for EGPRS simulation. EGPRS testing is supported by combining the MX847010A W-CDMA/GSM Simulation Kit with the MU847020B GSM Signalling Unit.

● **W-CDMA Ciphering Software (MX847011A)**
This software is required to test the W-CDMA ciphering function. It supports the standard ciphering algorithm in 3GPP.

● **GSM/GPRS Ciphering Software (MX847021A)**
Software required for testing GSM/GPRS ciphering function, supporting GSM A5/1, A5/2 and A5/3 ciphering algorithms plus GPRS GEA/1, GEA/2 and GEA/3 ciphering algorithms.

Software Maintenance Contract

● **MX847010A Support Service (One year) (MX847010A-20)**
This contract covers response to inquiries from users, and maintenance releases.
MX847010A-20 is the software maintenance contract for MX847010A.

Configurations

Configurations	Hardware/Software Options	MD8470A	MD8470A-02	MU847010B	MU847010B	MU847020B	MU847020B	MU847090B	MX847010A	MX847010A-01	MX847010A-11	MX847010A-12	MX847010A-20	MX847011A	MX847021A	MX847015A	MX847015A-01	MX847016A	Remarks
Single Configuration (1BTS)	W-CDMA	√		√				√*1	√				√	√*1					
	W-CDMA/HSDPA	√		√				√*1	√		√		√	√*1					
	W-CDMA/HSDPA/HSUPA	√		√				√*1	√		√	√	√	√*1					
	GSM/GPRS	√				√			√					√	√*1				
	GSM/GPRS/EGPRS	√				√			√	√				√	√*1				
	W-CDMA · GSM/GPRS	√		√		√		√*1	√					√*1	√*1				
	W-CDMA/HSDPA/HSUPA · GSM/GPRS/EGPRS	√		√		√		√*1	√	√	√	√	√	√*1	√*1				
End-to-End UE Test Configuration	End-to-End UE*2 (W-CDMA/W-CDMA)	√	√	√	√				√										*3, *4
	End-to-End UE*2 (GSM/GSM)	√	√			√	√		√										*3, *5
	End-to-End UE*2 (W-CDMA/GSM)	√	√		√				√										*3, *6
	End-to-End UE*2 (W-CDMA/W-CDMA, GSM/GSM, W-CDMA/GSM)	√	√	√	√	√	√		√										*3, *7
Handover Test Configuration (2BTS)	W-CDMA 2-Cell (Intra-system Handover)	√	√	√	√				√					√	√*1			√	
	W-CDMA/HSDPA/HSUPA 2-Cell (Intra-system Handover)	√	√	√	√				√		√	√	√	√*1				√	
	GSM/GPRS 2-Cell (Intra-system Handover)	√	√			√	√		√					√	√*1			√	
	GSM/GPRS/EGPRS 2-Cell (Intra-system Handover)	√	√			√	√		√	√				√	√*1			√	
	W-CDMA ⇔ GSM/GPRS InterRAT	√	√	√		√			√					√*1	√*1			√	
	W-CDMA/HSDPA/HSUPA ⇔ GSM/GPRS/EGPRS InterRAT	√	√	√		√			√	√	√	√	√	√*1	√*1			√	
	W-CDMA 2-Cell, GSM/GPRS 2-Cell, W-CDMA ⇔ GSM/GPRS InterRAT	√	√	√	√	√	√		√					√*1	√*1			√	
	W-CDMA/HSDPA/HSUPA 2-Cell, GSM/GPRS 2-Cell, W-CDMA/HSDPA/HSUPA ⇔ GSM/GPRS/EGPRS InterRAT	√	√	√	√	√	√		√	√	√	√	√	√*1	√*1			√	
UE Battery Test Configuration (Single)	W-CDMA	√		√				√*1	√					√		√			
	W-CDMA/HSDPA/HSUPA	√		√				√*1	√		√	√	√	√		√			
	GSM/GPRS	√				√			√					√		√			*3
	GSM/GPRS/EGPRS	√				√			√	√				√		√			*3
UE Battery Test Configuration (Parallel Phone)	W-CDMA Parallel Phone	√	√	√	√			√*1	√					√		√	√		
	W-CDMA/HSDPA/HSUPA Parallel Phone	√	√	√	√			√*1	√		√	√	√	√		√	√		
	GSM Parallel Phone	√	√			√	√		√					√		√	√		*3
	GSM/GPRS/EGPRS Parallel Phone	√	√			√	√		√	√				√		√	√		*3
	W-CDMA + GSM Parallel Phone	√	√	√		√		√*1	√					√		√	√		
	W-CDMA/HSDPA/HSUPA + GSM/GPRS/EGPRS Parallel Phone	√	√	√		√		√*1	√	√	√	√	√	√		√	√		
	W-CDMA/HSDPA/HSUPA Parallel Phone GSM/GPRS/EGPRS Parallel Phone	√	√	√	√	√	√	√*1	√	√	√	√	√	√		√	√		

W-CDMA/HSDPA/HSUPA Test Configuration: Runs simulation corresponding to W-CDMA/HSDPA/HSUPA 1BTS
GSM/GPRS/EGPRS Test Configuration: Runs simulation corresponding to GSM/GPRS/EGPRS 1BTS
W-CDMA/HSDPA/HSUPA/GSM/GPRS/EGPRS Test Configuration:
   Includes functions for test configurations for both W-CDMA/HSDPA/HSUPA and GSM/GPRS/EGPRS

*1: Optional
*2: End-to-End UE tests performed by a MD8470A (CNS: Couple-UE Network Simulator)
*3: Minimum configuration
*4: End-to-End voice call, video call, SMS, and MMS tests (Requires separate MMS application server)
*5: End-to-End voice call, SMS, and MMS tests (Requires separate MMS application server)
*6: End-to-End SMS and MMS tests (Requires separate MMS application server)
*7: See *4, *5, *6 for supported End-to-End tests

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names.
The actual name of the item may differ from the Order Name.

Model/Order No.	Name
MD8470A	**– Main frame –** Signalling Tester
Z0741 G0134 A0013 MX847000A	**– Standard accessories –** Power Cord, 2.6 m MD8470A Operation Manual (CD-ROM) Keyboard (Japanese or English)*1 Mouse Handset Platform Software
MD8470A-02 MU847010B MU847020B MU847090B	**– Units/Options –** Second RF Option W-CDMA/HSPA Signalling Unit GSM Signalling Unit ISDN Interface Unit
Z0863A/B Z0931A/B Z0991A/B Z0992A/B Z0993A/B Z0994A/B Z0995A/B Z0996A/B Z0716A/B	**– Upgrade option –** MU847020B Upgrade MU847020B Upgrade MU847010B Upgrade-11 MU847010B Upgrade-12 MU847010B Upgrade-22 RF Unit Upgrade-11 RF Unit Upgrade-12 RF Unit Upgrade-22 Retrofit Option
MD8470A-90 MD8470A-91	**– Warranty service –** Extended Three Year Warranty Service Extended Five Year Warranty Service
MX847010A MX847010A-01 MX847010A-11 MX847010A-12 MX847015A MX847015A-01 MX847016A MX847011A MX847021A MX847010A-20 Z0714 Z0715 Z0728	**– Software –** W-CDMA/GSM Simulation Kit*2 EGPRS Software HSDPA Software HSUPA Software Energy Management Test Simulator Parallel Phone Test Software for ETS Multi-cell Network Simulator W-CDMA Ciphering Software GSM/GPRS Ciphering Software MX847010A Support Service (One year) English OS Option Japanese OS Option Software Installation Kit
J1261A J1261B J1261C J1261D J1262A J1262B J0576B J0576D J0127A J0127B J1263 J0004 J1265 J0658 B0543 B0329D Z0749 J1287 P0035B	**– Application parts –** Ethernet Cable (Shield type, Straight), 1 m Ethernet Cable (Shield type, Straight), 3 m Ethernet Cable (Shield type, Cross), 1 m Ethernet Cable (Shield type, Cross), 3 m RS-232C Cable (Straight), 2 m RS-232C Cable (Cross), 2 m Coaxial Cord (N-P · 5D-2W · N-P), 1 m Coaxial Cord (N-P · 5D-2W · N-P), 2 m Coaxial Cord (BNC-P · RG58A/U · BNC-P), 1 m Coaxial Cord (BNC-P · RG58A/U · BNC-P), 2 m W-CDMA Interface Cable Coaxial Adapter (N-P · SMA-J) Adapter (Serial Connector) Adapter (SMA, L Type) Carrying Case Front Cover for 1MW 5U MN8110B + Inch Screw Cable HDD-SUB15P Cable (Milli-Inch) W-CDMA/GSM TEST USIM

*1: Selected by OS option
*2: P0035B W-CDMA/GSM TEST USIM supplied by this option

Anritsu

Anritsu Corporation
5-1-1 Onna, Atsugi-shi, Kanagawa, 243-8555 Japan
Phone: +81-46-223-1111
Fax: +81-46-296-1238

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

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

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

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

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

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

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

● **Italy**
Anritsu S.p.A.
Via Elio Vittorini 129, 00144 Roma, Italy
Phone: +39-6-509-9711
Fax: +39-6-502-2425

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

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

● **Denmark**
Anritsu A/S (Service Assurance)
Anritsu AB (Test & Measurement)
Kirkebjerg Allé 90, DK-2605 Brøndby, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

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

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

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

● **India**
Anritsu Pte. Ltd.
India Branch Office
3rd Floor, Shri Lakshminarayan Niwas, #2726, 80 ft Road,
HAL 3rd Stage, Bangalore - 560 075, India
Phone: +91-80-4058-1300
Fax: +91-80-4058-1301

● **P.R. China (Hong Kong)**
Anritsu Company Ltd.
Units 4 & 5, 28th Floor, Greenfield Tower, Concordia Plaza,
No. 1 Science Museum Road, Tsim Sha Tsui East,
Kowloon, Hong Kong
Phone: +852-2301-4980
Fax: +852-2301-3545

● **P.R. China (Beijing)**
Anritsu Company Ltd.
Beijing Representative Office
Room 2008, Beijing Fortune Building,
No. 5, Dong-San-Huan Bei Road,
Chao-Yang District, Beijing 100004, P.R. China
Phone: +86-10-6590-9230
Fax: +86-10-6590-9235

● **Korea**
Anritsu Corporation, Ltd.
8F Hyunjuk Building, 832-41, Yeoksam Dong,
Kangnam-ku, Seoul, 135-080, Korea
Phone: +82-2-553-6603
Fax: +82-2-553-6604

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

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

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Please Contact: