Anritsu envision : ensure

Signalling Tester

MD8475A
MD8475B

Q.1

Do you use a base station simulator to reproduce any of the world's communications systems on the workbench?

yes

no

Q.2

Do you have a hard time preparing complex measurement scenarios?

yes

no

Q.2

Do you know any complex measurement scenarios that are required for most base station simulators?

yes

no

yes

no

Q.3

Does your base station simulator meet the latest communications standards?

yes

no

Q.3

Does your base station simulator meet the existing communications standards?

yes Ans. B

no Ans. A

yes Ans. A

no Ans. B

Here's the Base Station Simulator It Answers All Your Questions.

Reproduce the world's communications systems in a small workbench.

As mobile terminals, such as smartphones, become increasingly high performance and diversified to enhance the user experience, carriers are starting to deploy LTE-Advanced technology as the next stage after LTE in speeding-up networks and meeting the needs of smartphone users. Additionally, the automotive world is pushing forward with new innovations, such as the connected car and self-driving vehicles, based on wireless communications technologies.
The Signalling Tester MD8475A/MD8475B is a base station simulator reproducing communications between base stations and UEs. It supports the full range of communication standards including LTE, and the Anritsu SmartStudio user interface, eliminates the need to create complex test scenarios, assuring efficient tests of complex UEs.

Ans. B

For R&D of New Mobile Terminals

Signalling Tester / Base Station Simulator

MD8475B

8TX/4RX RF | 3CC/4CC CA | IMS VoLTE

See page 40 for more details

For R&D of Automotive Solutions and Wireless Connectivity

Signalling Tester / Base Station Simulator

MD8475A

eCall ERA-GLONASS | Telematics | All RAT for Cellular

See page 29 for more details

Ans. A

POINT 1

Scenario-less UE Function Tests using SmartStudio

SmartStudio

See page 10 for more details

POINT 2

Automated Confirmation of Existing Mobile Functions using SmartStudio Manager

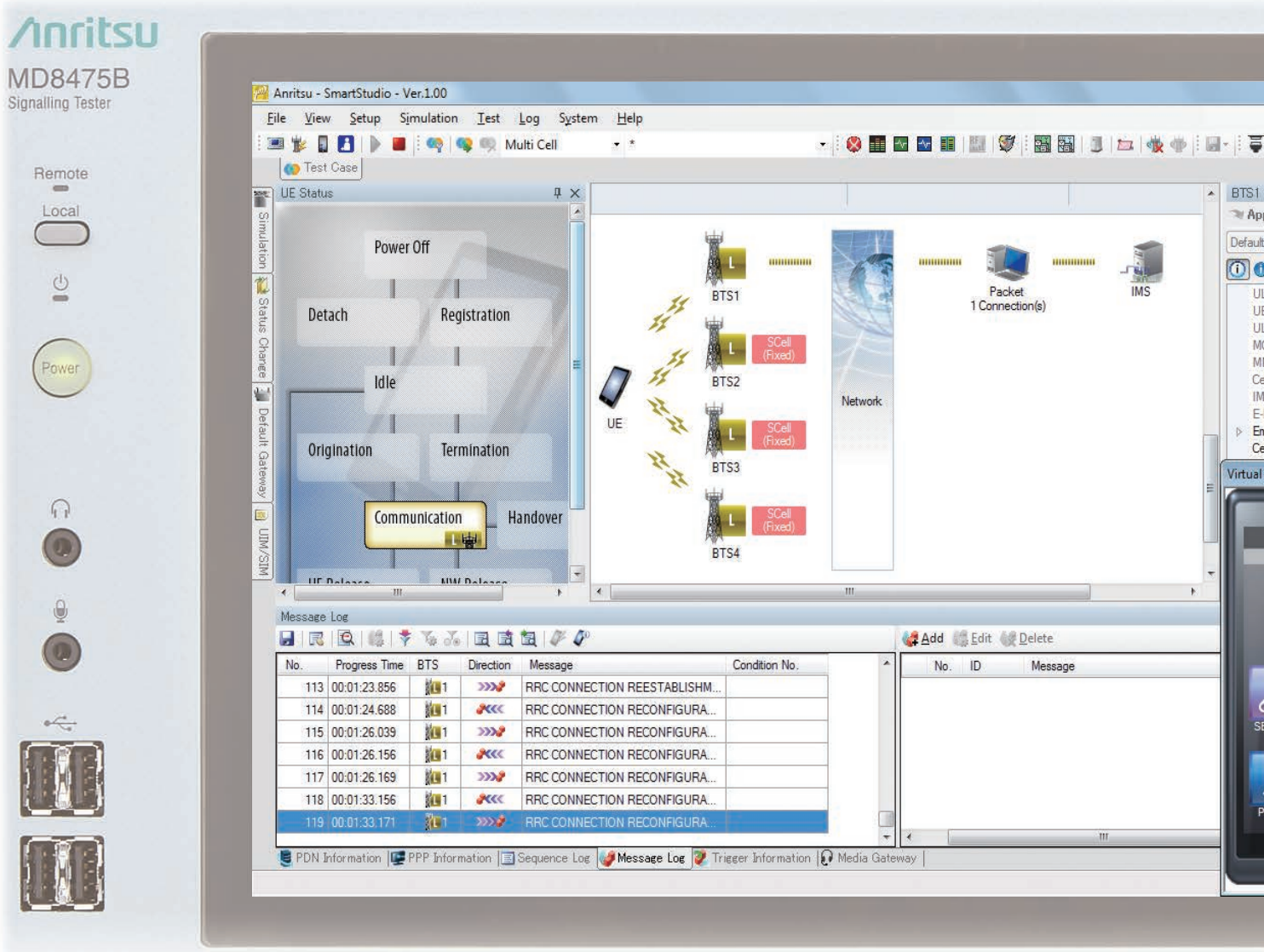
See page 12 for more details

POINT 3

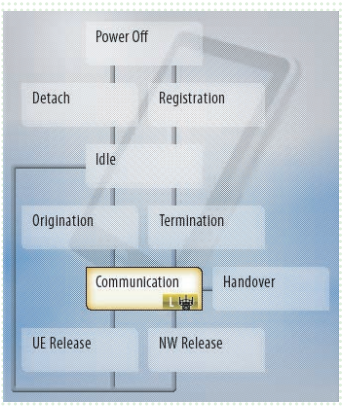
All-in-One Support for LTE and Other Communications Systems

See page 12 for more details

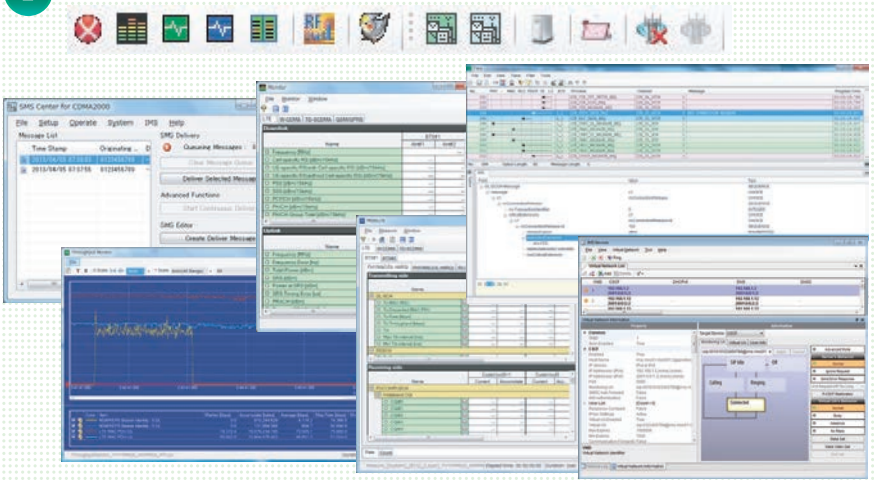
SmartStudio — Changing the Smartphone



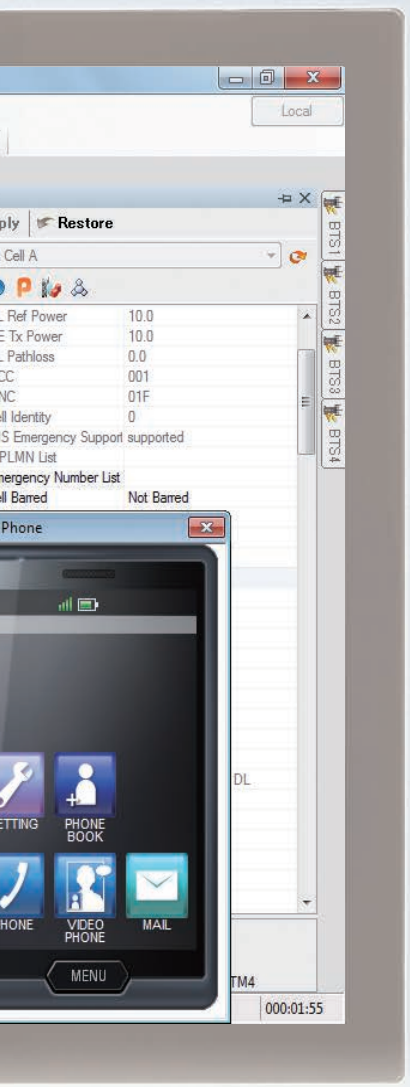
1 The connection status of UE and SmartStudio are easy to understand at a glance from the block diagram.



2 Throughput, Trace, etc., screens are fetched by clicking one button.



Test Environment

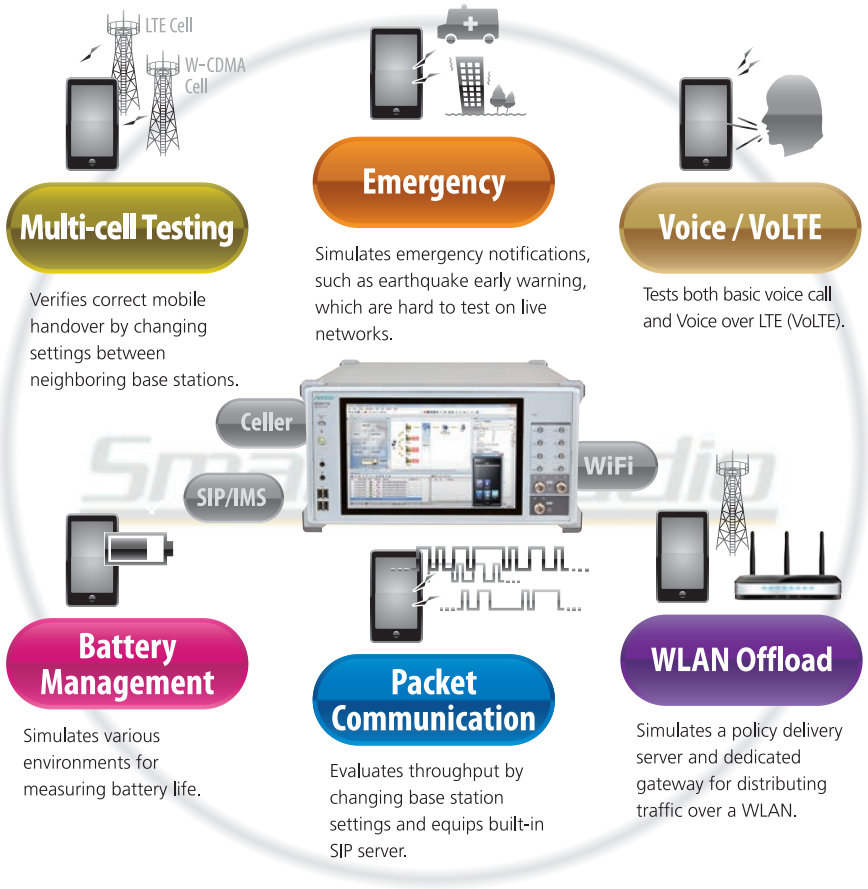


POINT 1

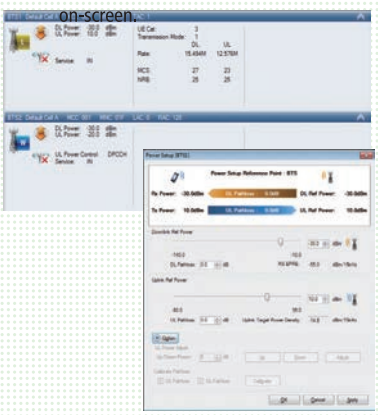
Scenario-less Mobile Phone Function Tests using SmartStudio

Supports Versatile Smartphone Tests

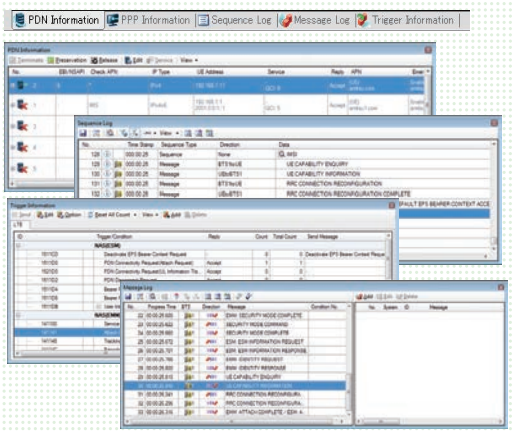
Complex tests of multifunction smartphones are supported by the all-in-one MD8475A/MD8475B with interactive SmartStudio interface.



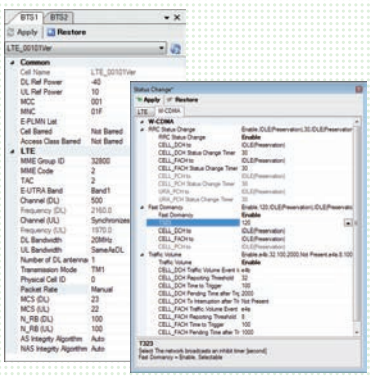
3 Double-clicking the base station band displays the base station status. Changes to base station parameters during testing are reflected immediately on-screen.



4 Details of the Smartphone and SmartStudio status can be verified easily. Changes to reject parameters during testing are reflected immediately on-screen.



5 Both base station parameters and packet communications can be controlled. Changes to status change parameters during testing are reflected immediately on-screen.



POINT 2
Automated Confirmation of Existing Mobile Functions using SmartStudio

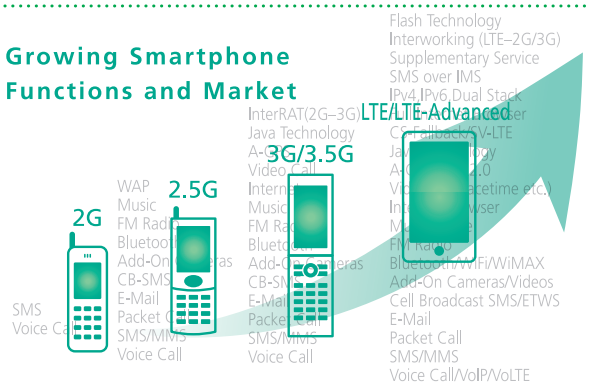
SmartStudio Manager helps improve development efficiency by automating checks of existing functions at UE development, such as Voice, SMS send/receive, and other tests.

POINT 3
All-in-One Support for LTE and Other Communications Systems

All the world's main communications technologies, such as triple-system LTE/W-CDMA/GSM mobiles and TD-LTE/TD-SCDMA/GSM as well as LTE/CDMA2000 hybrids, can be tested using the all-in-one MD8475A/MD8475B. (Requires installation of optional units and software for each systems).

TOPICS

Growing Smartphone Functions and Market



Mobile phones are becoming increasingly multifunctional as the worldwide mobile market expands and diversifies. As a result, mobile developers developing new hardware and services require increasing numbers of tests, such as maximum throughput, VoLTE and handover. As an example, battery tests must now not only include standby consumption, but also measurements while web browsing, video streaming, etc. Anritsu's MD8475A/MD8475B is the ideal cost-effective tool for these complex multiple tests and evaluations.

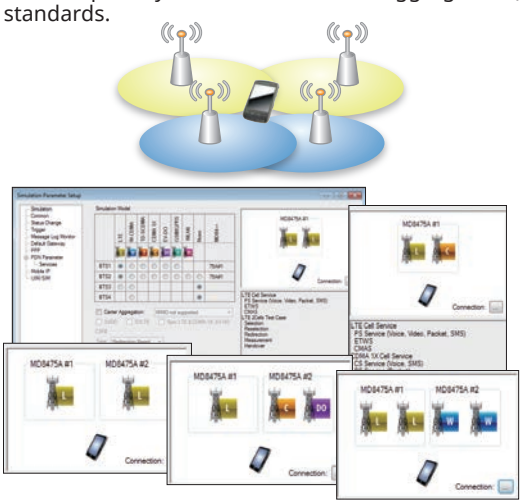
Signalling Tester MD8475A/MD8475B Applications

Configuring Multi-cell Test Environment

Performing UE tests between communications systems (handover tests) usually requires set-up of several measuring instruments and creation of complex scenarios. SmartStudio eliminates these problems by providing a simple test environment for fast and efficient testing.

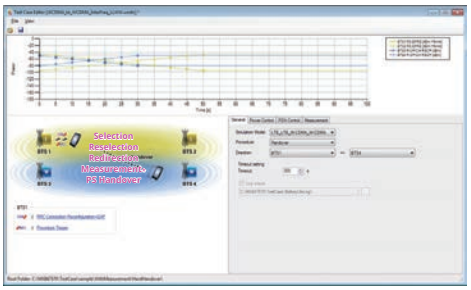
Multi System Configuration

Roaming and power consumption tests of UEs require multi-cell connections.
The MD8475A supports dual-RF tests. And MD8475B supports up to 8RF tests.
The SmartStudio GUI makes it easy to set multi-system test environments, especially for the latest Carrier Aggregation (CA) wireless standards.



Multi-cell Test Configurations

Tests of UEs moving between cells take the Selection, Redirection, Handover, and other conditions into consideration, depending on the UE and base station conditions. SmartStudio can register these UE and base station conditions, including the RF power, as a test case, making it quick and easy to evaluate UE behaviors and reproduce failures. Test cases are also useful for general UE evaluations when reproducing Handover failures.



Small-cell Switching Tests

Macrocell, small-cell, and femtocell base stations are being installed to provide wide coverage for people moving freely between base stations; SmartStudio provides easy test sequences for preferential capture of small-cells.

2-cell Testing Support by SmartStudio (MD8475A)

✓: Supported

Cell 1 \ Cell 2	LTE FDD/TDD	W-CDMA/HSPA/ HSPA Evolution/ DC-HSDPA	GSM/GPRS/ EGPRS	CDMA2000 1X	CDMA2000 1xEV-DO	TD-SCDMA/ TD-HSPA	WLAN
LTE FDD/TDD	✓*1,*2	✓	✓	✓*3	✓*3	✓	✓*4
W-CDMA/HSPA/HSPA Evolution/DC-HSDPA	✓	✓	✓	✓	✓	✓	✓*4
GSM/GPRS/EGPRS	✓	✓	✓	—	—	✓	✓*4
CDMA2000 1X	✓*3	—	—	—	✓	—	✓*4
CDMA2000 1xEV-DO	✓*3	—	—	✓	—	—	✓*4
TD-SCDMA/TD-HSPA	✓	✓	✓	—	—	✓	✓*4
WLAN	✓*4	✓*4	✓*4	✓*4	✓*4	✓*4	✓*4

*1: Two MD8475A units are required for MIMO connection.
*2: LTE-FDD/TDD joint test requires Signalling Tester MD8430A separately.
*3: A hybrid mode test environment for LTE-CDMA2000 1X-CDMA2000 1xEV-DO can be configured using two MD8475A units.
*4: One external PC is required for WLAN Offload use.

2-cell Testing Support by SmartStudio (MD8475B)

✓: Supported

Cell 1 \ Cell 2	LTE FDD/TDD	W-CDMA/HSPA/ HSPA Evolution/ DC-HSDPA	GSM/GPRS/ EGPRS	CDMA2000 1X	CDMA2000 1xEV-DO	TD-SCDMA/ TD-HSPA*2	WLAN
LTE FDD/TDD	✓*1	✓	✓	✓	✓	—	✓*3
W-CDMA/HSPA/HSPA Evolution/DC-HSDPA	✓	✓	✓	✓	✓	—	✓*3
GSM/GPRS/EGPRS	✓	✓	✓	—	—	—	✓*3
CDMA2000 1X	✓	—	—	—	✓	—	✓*3
CDMA2000 1xEV-DO	✓	—	—	✓	—	—	✓*3
TD-SCDMA/TD-HSPA*2	—	—	—	—	—	—	—
WLAN	✓*3	✓*3	✓*3	✓*3	✓*3	—	—

*1: LTE FDD/TDD Joint Operation to be supported by MD8475B in future.
*2: TD-SCDMA /TD-HSPA to be supported by MD8475B in future.
*3: One external PC is required for WLAN Offload use.

Multi-cell Testing Support by SmartStudio (MD8475B)

Cell 1	Cell 2	Cell 3	Cell 4
LTE	LTE	LTE	—
LTE	LTE	W-CDMA	—
LTE	LTE	GSM	—
LTE	LTE	TD-SCDMA	—
LTE	CDMA2000 1X	CDMA2000 1xEV-DO	—
LTE	LTE	CDMA2000 1X or CDMA2000 1xEV-DO	—
LTE	LTE	LTE	LTE

LTE FDD/TDD Joint Operation to be supported by MD8475B in future.

Configuring Multi-cell Test Environment

Carrier Aggregation Tests

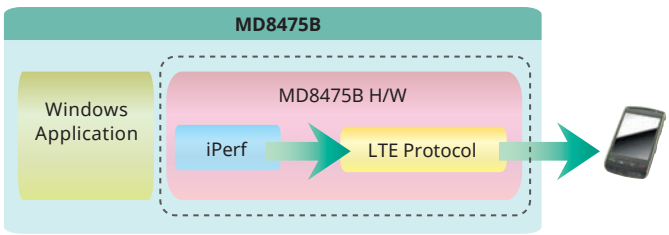
The MD8475A/MD8475B supports LTE CA 2CC/3CC/4CC for throughput performance tests of UEs, such as smartphones using high-speed data networks.

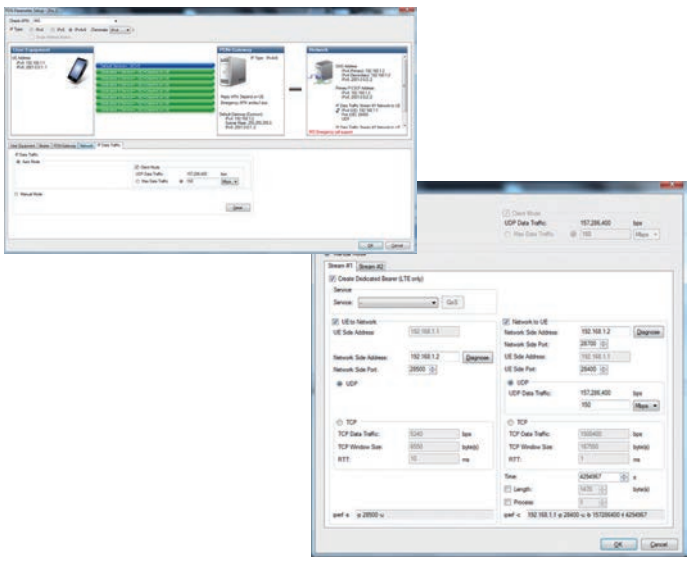
	MD8475A	MD8475B
Configuration		
Operation Software	SmartStudio	
Required CA Option	MX847550A-040	MX847550B-040 MX847570B-051
RF	1TX/1RX (standard), 2TX/2RX (option)	4TX/2RX (standard), 8TX/4RX (option)
Support for DL CA	2CC SISO 2CC MIMO (2×2*)	2CC SISO 2CC MIMO (2×2) 3CC SISO 3CC MIMO (2×2) 4CC SISO 4CC MIMO (2×2)
UE Category	Cat.4, Cat.6, Cat.9	Cat.4, Cat.6, Cat.9, Cat.11

∗: Two MD8475A units are required.

IP Traffic Generator (MD8475B)

The IP Packet Generator built into the MD8475B hardware is a key element to simplify data throughput tests.
A high-repeatability, high-stability data throughput test environment can be configured using the built-in packet generator, and the system can be automated with external control using the optional SmartStudio Manager MX847503A .



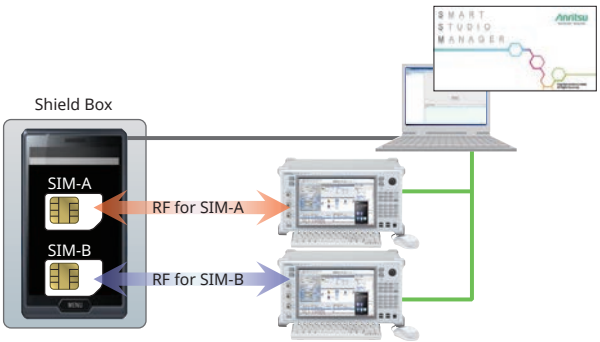


SIM Connectivity Test

Dual SIM Dual Standby (DSDS) and Dual SIM Dual Active (DSDA) tests of dual-SIM UE can be performed using two MD8475A sets. Additionally, Single SIM Dual Standby (SSDS) and Single SIM Dual Active (SSDA) of single-SIM UE can be performed using one MD8475A/MD8475B. These test environments can be fully automated using SmartStudio Manager.

Test Example:

The power consumption and throughput of a dual-SIM UE can be confirmed while the UE is making a voice call using SIM1 and transferring packet data using SIM2.



Signalling Tester MD8475A/MD8475B Applications

Data Packet Communications

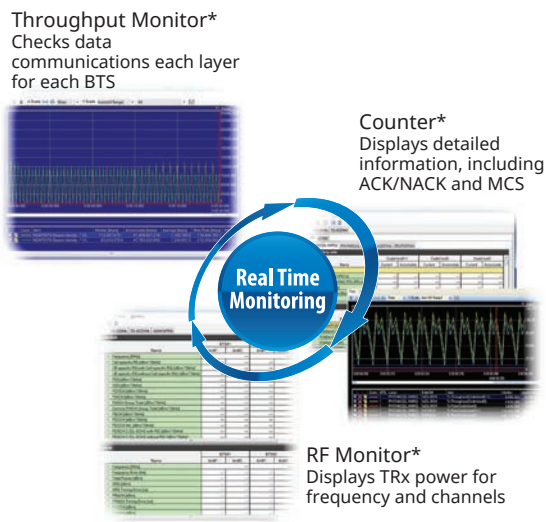
Data packet communication environments are complex, but SmartStudio makes it easy to resolve troublesome packet bottlenecks, shortening evaluation times.

Versatile Server Environment

Because the MD8475A/MD8475B pre-installs Windows 7, commercial application servers can be easily installed.

Status Evaluation

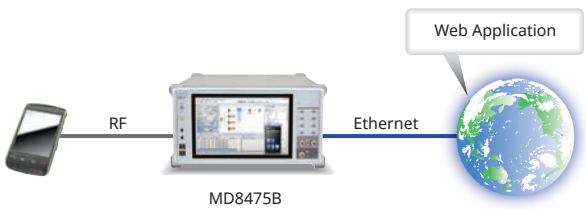
A full line of function tools can be used to check communication status, including throughput, ACK/NACK counts, and RF monitoring. Simultaneous checking of multiple layers allows quick troubleshooting during data communications.



*: Not supported for CDMA2000.

Genuine Application Test Environment

Connecting the MD8475A/MD8475B to the Internet supports Web application tests using UEs under development to verify actual in-use power consumption and throughput before market release.



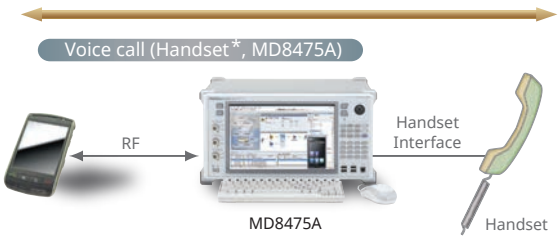
Signalling Tester MD8475A/MD8475B Applications

Voice Call Evaluation Environment

The need for voice-call evaluations has not changed even with the spread of LTE services. However, some voice-call test items, such as the access barred condition and emergency calls, are not easily evaluated on live networks. SmartStudio supports comprehensive evaluation of UE under high-load conditions, such as testing of simultaneous voice calls and other functions.

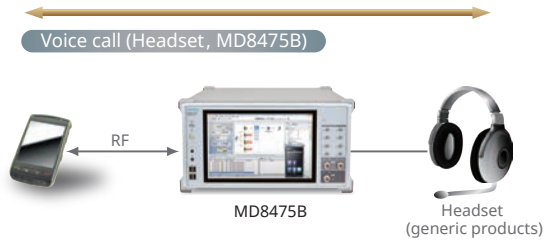
3G/2G Voice Calling Test

Just making voice settings using SmartStudio is all that is necessary for voice tests with the MD8475A/MD8475B.



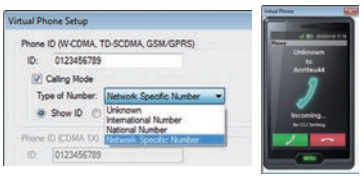
*: Not supported for LTE/CDMA2000.

Multimedia Interface Software MX847508B



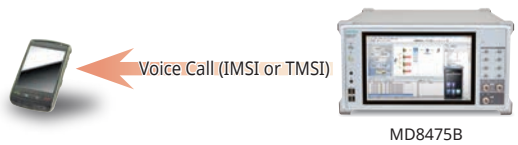
Setting Roaming and Registering Address Book

When performing incoming-call tests of W-CDMA/GSM UE, SmartStudio can display any of 'Public', 'National', 'International', and 'Unknown' on the UE. Additionally, when the incoming call number matches a preregistered number in the address book, the name associated with the number is displayed.



Setting Identify Type

When performing incoming call tests of W-CDMA/GSM UEs, either IMSI or TMSI can be chosen for the UE Caller ID using Paging.



Voice Call Evaluation Environment

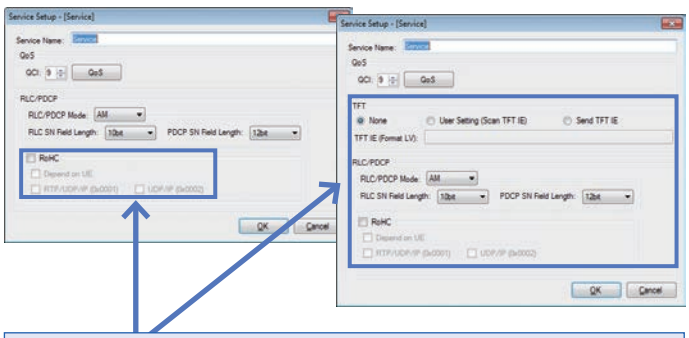
Voice over LTE Tests

Since LTE uses the data network, Voice over LTE (VoLTE) communications also use the data network; SmartStudio simplifies VoLTE tests.

Loopback Tests of VoLTE/Video

The SmartStudio CSCF function supports VoLTE tests (AMR/W-AMR Codec, etc.) in the loopback mode.

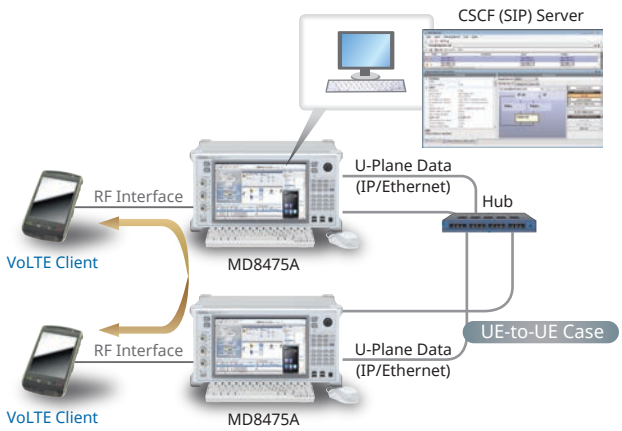
In addition to an IMS server, VoLTE tests require a variety of LTE settings about multi-PDN. Not only does SmartStudio support multi-PDN*1, but it it also supports packet filter and QoS settings.



Sets RoHC*2 and TFT filter at Default Bearer and Dedicated Bearer

End-to-End Tests of VoLTE and Video Call

Voice over LTE can be tested between two LTE UEs in both directions using two MD8475A units to benchmark and evaluate calls between actual UEs.



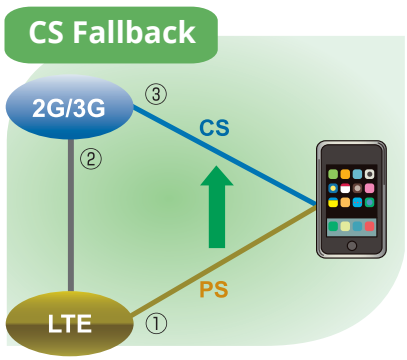
*1: GSM and TD-SCDMA are not supported.
*2: RoHC settings require the MX847550A-060 or MX847550B-060 option. The RTP/VDP/IP (0x0001) and UDP/IP RoHC (0x0002) profiles are supported.

Signalling Tester MD8475A/MD8475B Applications

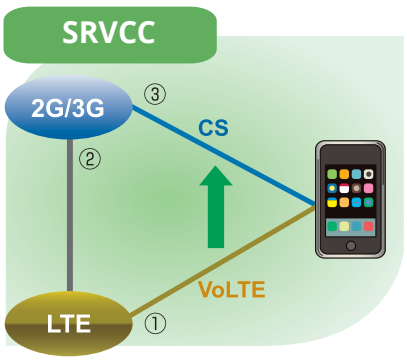
Voice Call Evaluation Environment

Testing Voice Calls from LTE to 3G/2G

A variety of technologies are used when a UE moves between systems from an LTE to 3G/2G cell. Configuring a 2-cell test environment using SmartStudio supports LTE and 2G/3G system voice call tests such as CS Fallback and SV-LTE (Simultaneous Voice and LTE).



① LTE: Communications by PS
② Receive call by CS and notify UE of incoming call via LTE from 2G/3G system
③ Connect voice call by CS



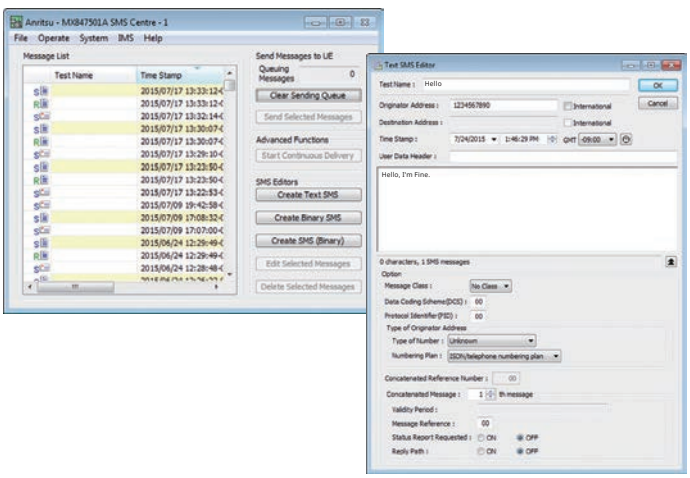
① LTE: Calling over VoLTE
② Transfer 3G/2G information from base station before moving between systems
③ Continue voice call without interruption

SMS Tests

SMS and MMS are popular messaging services used worldwide. Exchanges between UEs as well as the number of verification items are both increasing because more direct control of UE is being attempted now.

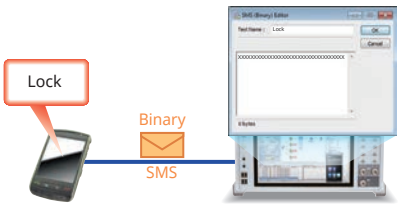
Sending/Receiving SMS Text Messages

SmartStudio has a dedicated SMS server supporting sending and receiving of SMS messages at any PS or CS network setting. Multiple SMS messages can be preregistered for continuous sending and CBS messages can be sent too.



Sending Binary SMS

The MD8475A/MD8475B can send binary messages as SMS supporting remote control of the UE. Additionally, general evaluations, such as behavior when receiving an SMS during a voice call, can be evaluated to help prevent problems occurring in the field.

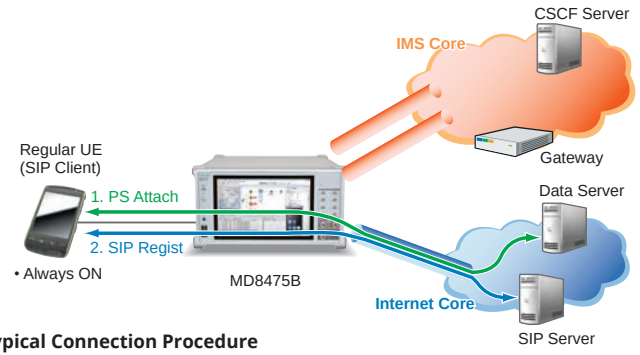


MD8475B

IMS Service Tests

SmartStudio has a built-in standard server environment for running IMS server functions for easy service tests, including VoLTE, SMS over IMS, etc.

SIP Registration of a Non-IMS UE

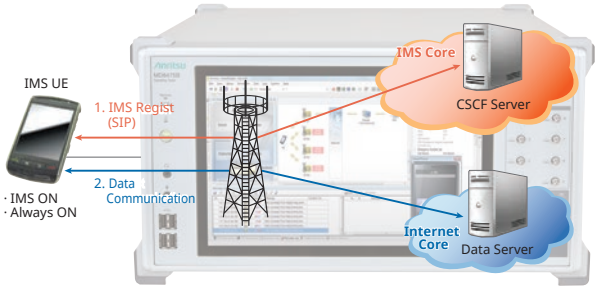


Typical Connection Procedure

1. PS Attach: Connect to Data server.
   → Get address using DNS, etc.
2. SIP Regist:
   → Depends on application.

⇒ One PDN is required.

SIP Registration of an IMS UE



Typical Connection Procedure

1. IMS Regist: Connect to CSCF server using SIP.
2. Data Communication: Connect to Data server.

⇒ Consequently, two or more PDN required.

Standard IMS Server Function

CSCF (Call Session Control Function)

Supports standard server function for VoLTE and SMS over IMS tests as well as voice data loopback function. IPsec is supported too.

DHCPv6 (Dynamic Host Configuration Protocol v6)

Allocates IPv6 address and notifies DNS/SIP server address to network node.

DNS (Domain Name Server)

Operates as DNS cache server.

NDP (Neighbor Discovery Protocol)

Supports function to transmit RA (Router Advertisement) and periodically transmit RA to RS (Router Solicitation).

NTP (Network Time Protocol)

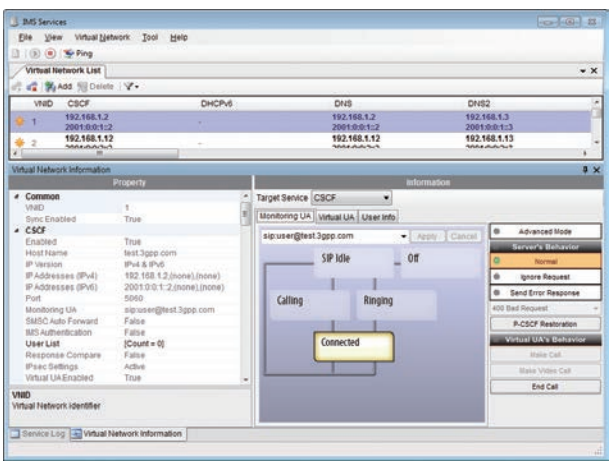
The UE and MD8475A times are synchronized by sending time data in response to an NTP request.

PSAP (Public Safety Answering Point)

The UA (User Agent) and voice data loopback function support PSAP simulation for running IMS Emergency tests.

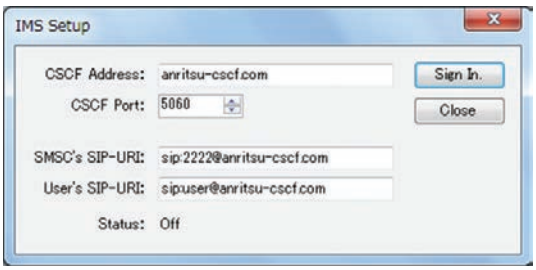
XCAP (XML Configuration Access Protocol)

This function supports updating, referencing, and deleting of XML format file data (XCAP documents).



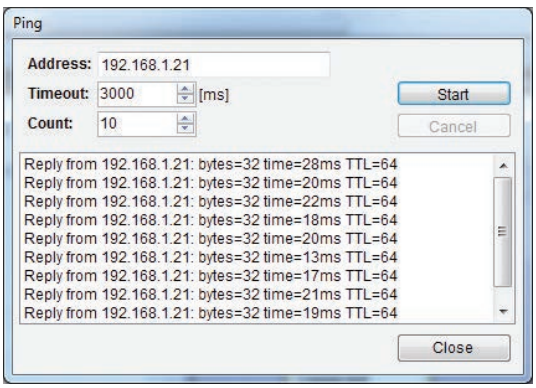
SMS over IMS Setting

UE can register with CSCF server, and can transmit and receive SMS over IMS.



Ping Sending Function

The Ping sending function is used to verify the connection of the device under test to the network.



IMS Options

Extended CSCF Option MX847570A-080/MX847570B-080

Various conditions can be set for VoLTE/Video quasi-normal and abnormal tests. Moreover, VoLTE call and hang-up sequences can both be confirmed from SmartStudio. In addition, VoLTE/Video audio codec switchover tests are supported as well.

Virtual UA Calling/Release

VoLTE calling from the SmartStudio simulated UE (Virtual UA) is supported. In addition, any Virtual UA response can be set.

Network Fault

The occurrence of a server or network fault can be created.

Message Blocking

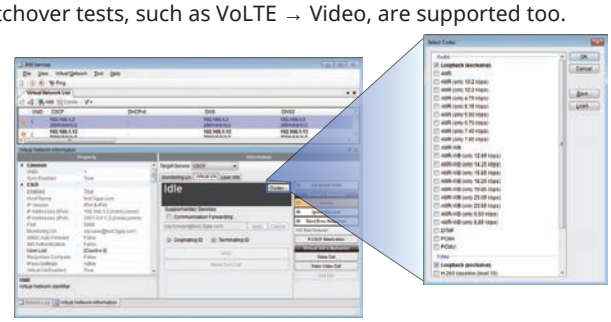
Ignore and Reply responses to specific messages can be changed arbitrarily.

Multi-P-CSCF Settings

Up to three types of P-CDCF addresses can be notified to UE by one PDN to confirm correct UE operation for multiple addresses.

Voice Codec Switchover

Any codec can be sent from the MD8475A/MD8475B to the UE, and switchover tests, such as VoLTE → Video, are supported too.

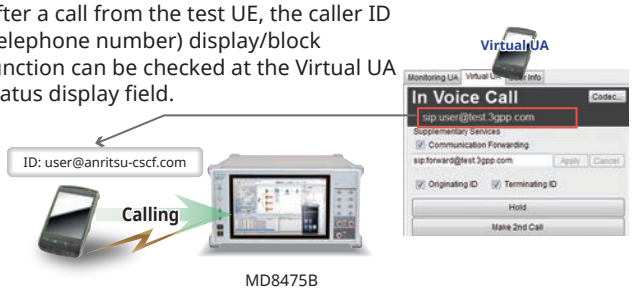


IMS Supplementary Service Option MX847570A-081/MX847570B-081

This option adds functions for simulating VoLTE/Video caller ID, call transfer and call hold. Various CSCF and XCAP service settings as well as supplementary service functions can be set.

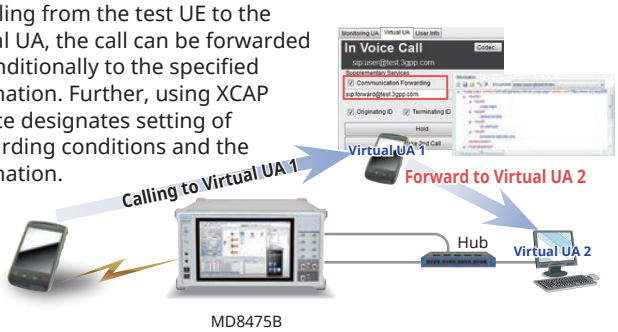
Caller ID Display ON/OFF Function

After a call from the test UE, the caller ID (telephone number) display/block function can be checked at the Virtual UA status display field.



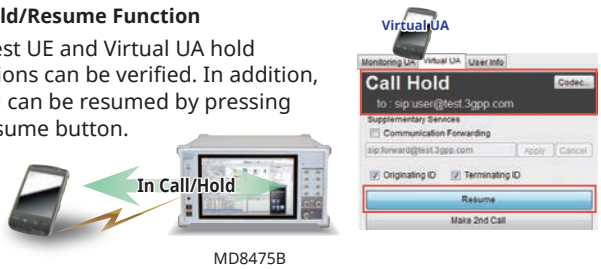
Forwarding Function

At calling from the test UE to the Virtual UA, the call can be forwarded unconditionally to the specified destination. Further, using XCAP Service designates setting of forwarding conditions and the destination.



Call Hold/Resume Function

Both test UE and Virtual UA hold operations can be verified. In addition, the call can be resumed by pressing the Resume button.



VoLTE Conference Test

The 3GPP TS 24.605 defined VoLTE Conference Call functions can be tested.

3GPP TS 24.605	
4.5.2.1.1	User joining a conference
4.5.2.1.2	User inviting another user to a conference
4.5.2.1.3	User leaving a conference
4.5.2.1.4	User creating a conference
4.5.2.1.5	Subscription for the conference event package
4.5.2.2.1	Conference focus
4.5.2.2.2	Conference notification service
4.5.2.7	Actions at the destination UE
4.6.1	Communication HOLD (HOLD)
4.6.3	Terminating Identification Restriction (TIR)
4.6.5	Originating Identification Restriction (OIR)

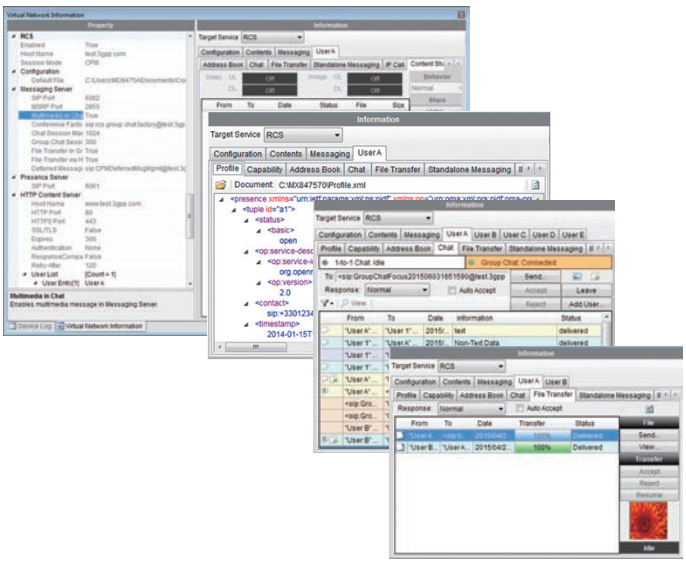
IMS Options

RCS Basic Option MX847570A-083/MX847570B-083

Rich Communication Suite (RCS) is the next evolutionary step in deploying existing simple voice and messaging (SMS, MMS) services on various networks and UEs with “rich” communications. Installing this software supports RCS defined tests of Instant Messaging (IM), Address Book, and Contents sharing.

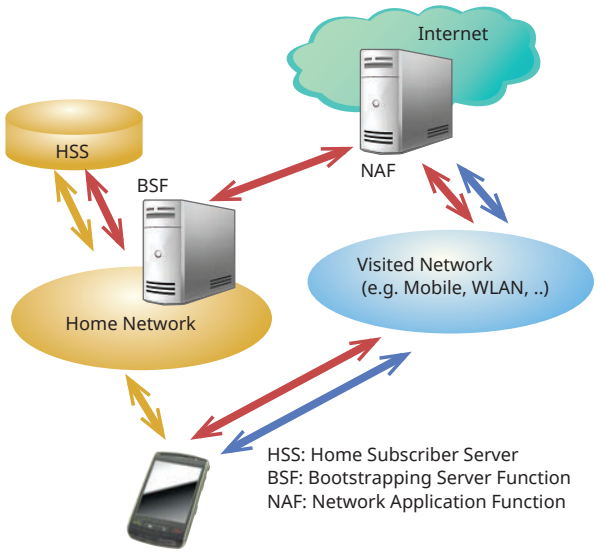
Item	Note
Configuration & Registration	HTTP (S) based support
Capability Discovery	
Standalone Messaging	
1-to-1 Chat	
Group Chat	
File Transfer	
Content Sharing	
Social Presence Information	Geolocation service not supported
IP Voice Call	IR.92 based support Interaction with other RCS services not supported
IP Video Call (IR.94)	IR.94 based support

RCS Service Image



GBA Authentication Option MX847570A-084/MX847570B-084

The software option references the 3GPP GBA Authentication algorithm to simulate the authentication procedure required when connecting to the Internet via networks other than Home Networks.

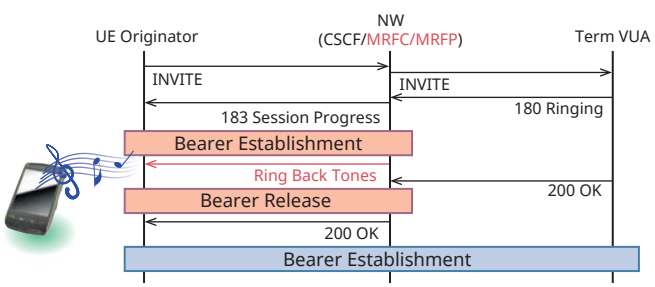


IMS Early Media Option MX847570A-085/MX847570B-085

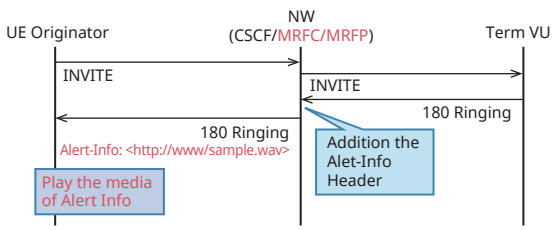
The software option simulates the IMS Early Media sequence. It supports MRFC, MRFP, etc., nodes and can authenticate service functions such as customized ringtones from the network side.

NRBT: Function for recovering RBT (ring back tone) from network rather than from UE

The recovery status (recovery possible/not possible/recovering/stopped) for each session is displayed on the Information screen.



Alert-Info: Provides substitute ring back tone using Alert-Info, one of the Early Media switching function



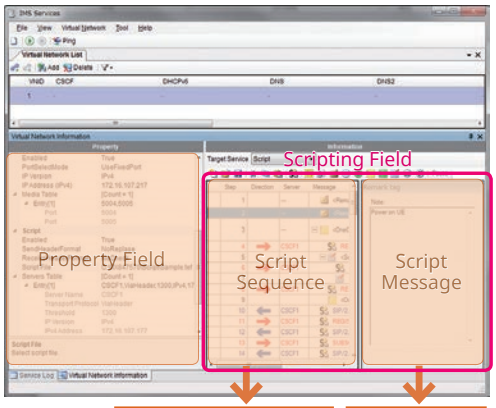
IMS Options

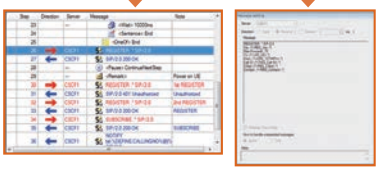
IMS Script Basic Option MX847570A-060/MX847570B-060

The software option can be used to edit and create SIP messages using a ladder sequence to simulate the CSCF server behavior. Not only can configure a test environment from the service designing specification stage, but also user-specific tests, such as quasi-normal and abnormal conditions, can also be tested to easily support every test requirement.

Property Field:
Network parameters such as IP address are set here.

Scripting Field:
Sequence messages between the UE and CSCF are edited and executed here.





Script Message

IMS Options (MD8475A/MD8475B)

✓: Supported

Section	Function	Outline	GUI Option						Scripting Option*2	
			MX847570A MX847570B	MX847570A-080 MX847570B-080	MX847570A-081 MX847570B-081	MX847570A-083 MX847570B-083	MX847570A-084 MX847570B-084	MX847570A-085 MX847570B-085	MX847570A-060 MX847570B-060	MX847570A-061 MX847570B-061
General	SIP REGIST Test	Function for verifying CSCF server Bind/Unbind operation	✓	—	—	—	—	—	✓	—
	IPsec	Function for on/off of IPsec (3DES, AES).	✓	—	—	—	—	—	✓	—
	DNS Server	Function for resolving address using DNS	✓	—	—	—	—	—	—	—
	NTP Server	Function for synchronizing time using NTP	✓	—	—	—	—	—	—	—
	PSAP Server	Function for looping-back voice for IMS Emergency	✓	—	—	—	—	—	✓	—
	X-CAP Server	Function for verifying service using XML file	✓	—	—	—	—	—	—	✓
	BSF Server	Function for verifying GBA	—	—	—	—	✓	—	—	—
	No Server (Network) Response Test	Function for verifying operation when no response due to error at server or network	—	✓	—	—	—	—	✓	✓
	Server Error Test	Function for verifying operation when error response received from server due to the error at server	—	✓	—	—	—	—	✓	✓
	Multi P-CSCF	Function for reporting up to three P-CSCF servers to UE	—	✓	—	—	—	—	—	—
VoLTE/ Video Telephony	Calling Sequence Test	Function for verifying call sequence from UE	✓	—	—	—	—	—	✓	—
	Incoming Call Sequence Test	Function for verifying call sequence to UE	—	✓*1	—	—	—	—	✓	—
	Voice Loopback Test	Function for looping-back and sending uplink voice data to verify call at UE side	✓	—	—	—	—	—	✓	—
	Early media Test	Function for verifying early media sequence and Ring Back Tone	—	—	—	—	—	✓	—	—
	Disconnection (from UE) Sequence Test	Function for verifying disconnection sequence from UE	✓	—	—	—	—	—	✓	—
	Disconnection (from NW) Sequence Test	Function for verifying disconnection sequence from network	—	✓*1	—	—	—	—	✓	—
	Called Party Busy Test	Function for verifying operation when called party busy	—	✓	—	—	—	—	✓	—
	Called Party Not Found Test	Function for verifying operation when called party not found	—	✓	—	—	—	—	✓	—
	Called Party No Reponse Test	Function for verifying operation when no response from called party	—	✓	—	—	—	—	✓	—
	Codec Selection	Function for confirming VoLTE/VT traffic with any codec; also performs loopback	—	✓	—	—	—	—	✓	—
	VoLTE/Video Telephony Upgrade/Downgrade	Switches VoLTE/Video Telephony during call	—	✓	—	—	—	—	✓	—
	Call ID Display/Block	TS 24.607 verifies IMS test UE caller ID display ON/OFF	—	—	✓	—	—	—	✓	✓
	Incoming Call ID Display/Block	TS 24.608 verifies IMS test UE incoming caller ID display ON/OFF	—	—	✓	—	—	—	✓	✓
	Call Forwarding, Holding, Catchphone	Function for simulating TS 24.604, TS 24.610, TS 24.615 call forwarding, call holding, and catchphone functions	—	—	✓	—	—	—	—	✓
	VoLTE Conference Environment	Function for verifying TS 24.605 VoLTE Conference related tests (Event message, HOLD, etc.)	—	—	✓	—	—	—	✓	✓
	Message Waiting Indication	Function for notifying users of voice mail services about arriving voice mail	—	—	✓	—	—	—	✓	✓
RCS	Configuration	Function for creating and updating UE configuration data using XML file	—	—	—	✓	—	—	—	—
	Presence	Function for referring UE configuration data using XML file	—	—	—	✓	—	—	—	—
	Instant Messaging	Function for sending and receiving Instant Message using XML file	—	—	—	✓	—	—	—	—
	RCS Address Book	Function for registering and saving UE contacts using RCS	—	—	—	✓	—	—	—	—
	1 to 1 Chat (CPM)	Function for 1 to 1 chat by connecting with CPM mode	—	—	—	✓	—	—	—	—
	Group Chat	Function for multi party chat (Maximum 5 users)	—	—	—	✓	—	—	—	—
	File Transfer	Function for sending and receiving same files between users	—	—	—	✓	—	—	—	—
	Contents Sharing	Function for sharing same files between users	—	—	—	✓	—	—	—	—
SMS over IMS	SMS Message Send Test	Function for verifying UE SMS message sending	✓	—	—	—	—	—	✓	✓
	SMS Message Receive Test	Function for verifying UE SMS message receiving	✓	—	—	—	—	—	✓	✓
IPv6 Addressing	IP Address Allocation Test (RA)	Function for verifying IP address setting at RA receiving	✓	—	—	—	—	—	—	—
	IP Address Allocation Test (DHCPv6)	Function for verifying IP address setting allocated from DHCPv6 server	✓	—	—	—	—	—	—	—
VoLTE Emergency Call	VoLTE Emergency Call (Voice)	Function for verifying IP VoLTE Emergency Call	—	✓	—	—	—	—	—	—

*1: This option is unnecessary when a separate network-side UE is prepared.
*2: The user must create the test message script

New Services

New network services are being deployed at an increasing rate, requiring more-and-more tests for UEs supporting such new services. The MD8475A/MD8475B makes it easy to support new mobile test environments.

WLAN Offload Tests

Offloading data traffic to WLAN networks is being deployed as a technology for preventing traffic congestion on mobile networks. The MD8475A/MD8475B supports a WLAN data offload test environment.

WLAN Offload Basic Option MX847570A-070/MX847570B-070

The software option provides functions for forwarding packets between the UE and networks with both Trusted non-3GPP Access and Untrusted non-3GPP Access authentication functions, as well as for monitoring packets graphically.

ePDG Option MX847570A-071/MX847570B-071

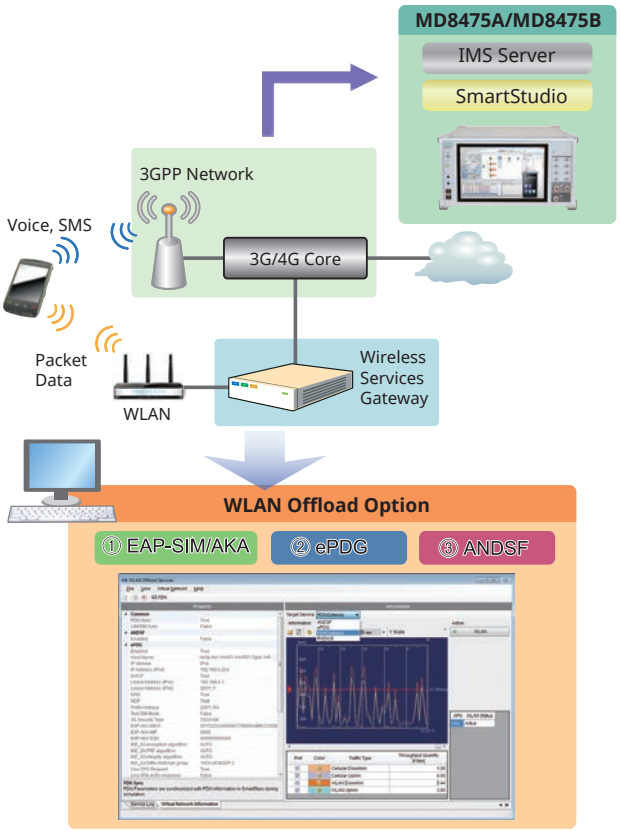
The software option supports the IKEv2 key exchange procedure and IPsec communications functions for Untrusted non-3GPP Access network authentication.

ANDSF Option MX847570A-072/MX847570B-072

The software option supports the function for setting and distributing the system selection policy between 3GPP and WLAN (distributes Policy and Discovery Information according to request from UE, and receives Location and Profile reports from UE).

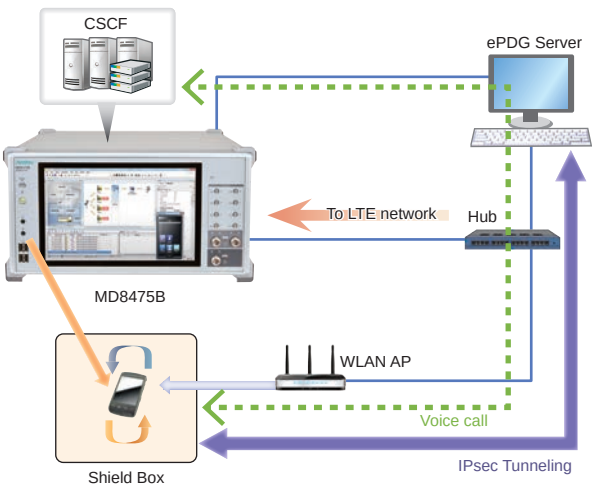
Extended ePDG Option MX847570A-073/MX847570B-073

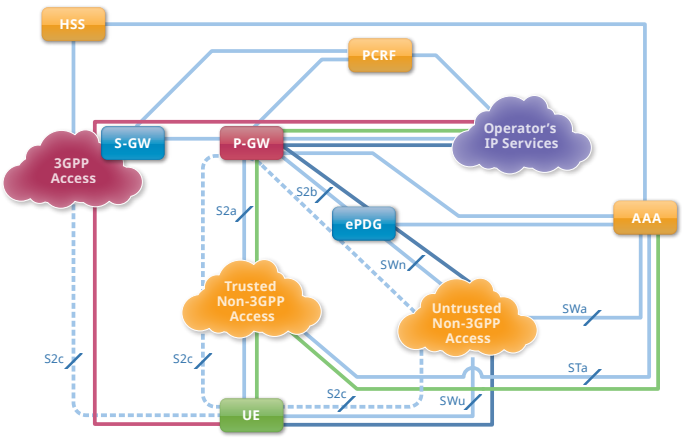
The software option supports configuration of an ePDG status fault test environment for inserting errors into the ePDG sequence, setting timeouts, etc. Additionally, this option can be used to support Fast Re-Authentication (EAP-SIM/EAP-AKA) tests without the need to generate UE-side authentication keys.



WLAN Calling Evaluation Environment

WLAN Calling is a function for making voice calls and sending/receiving SMS over WLAN. Using this function, voice calls can be made using the telephone number registered inside the SIM card. Combining the MD8475A/MD8475B with the WLAN option supports verification of WLAN Calling voice calls as well as handover tests from VoLTE to WLAN Calling and vice versa.





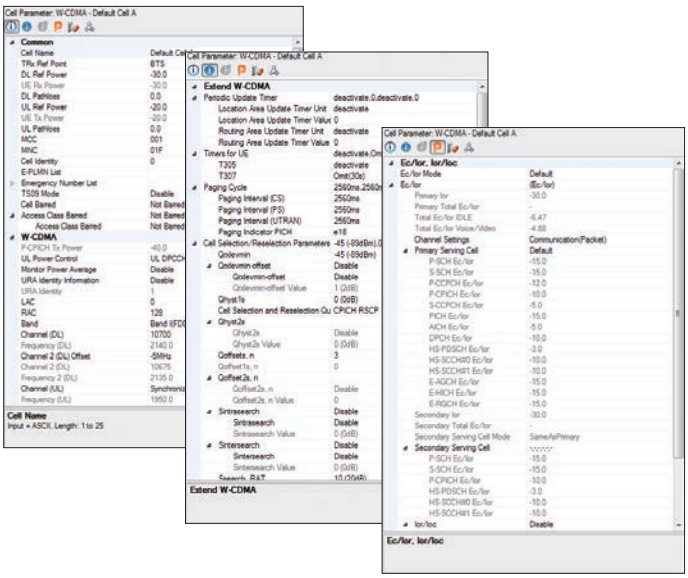
Power Consumption Test

SmartStudio supports detailed settings such as changes to the UE RF output and stopping packet communications.

Base Station Settings

Any messages, such as Paging Cycle, UL TPC, etc., can be sent to the UE*.

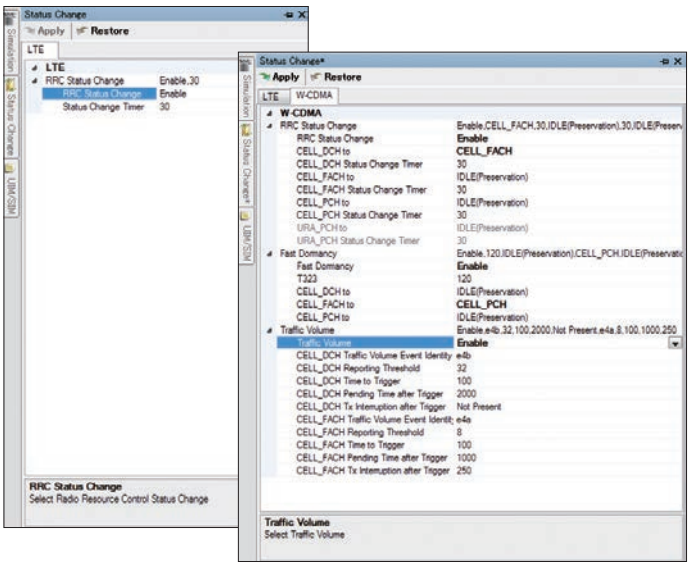
Support W-CDMA CPC, Ec/Ior, etc.



*: The settable items differ by the systems.

RRC State Change Settings

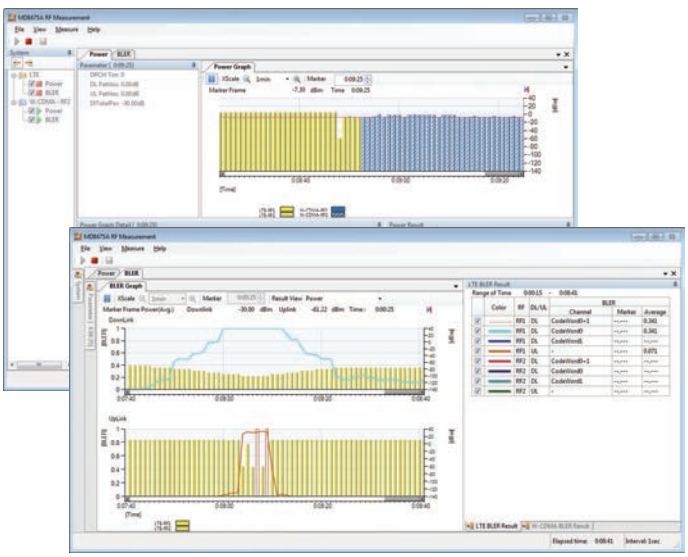
When packets stop passing over the network during data packet communications, the Cell Status can be transitioned at a specific timing to switch the UE to any RRC State. This is useful for configuring a test environment simulating a real network when testing battery life.



Check UE Tx RF Power

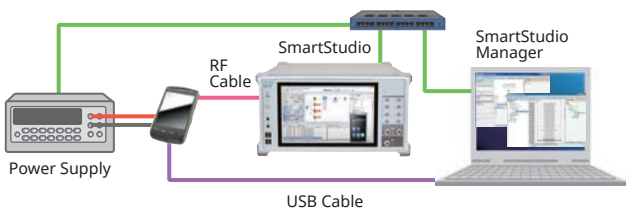
RF Measurement MX847506A

Adding RF Measurement supports verification of UE Tx RF power. A UE power consumption test environment can be configured easily by combined use with SmartStudio base station settings from the UE. Further, BLER can be verified using graphical or tabulated data.



Power Consumption Test using SmartStudio Manager

The MX847503A SmartStudio Manager software is bundled with test cases for measuring the UE power consumption. In addition, the MX847503A can also control peripheral devices simultaneously, shortening the time required for configuring UE test environments.



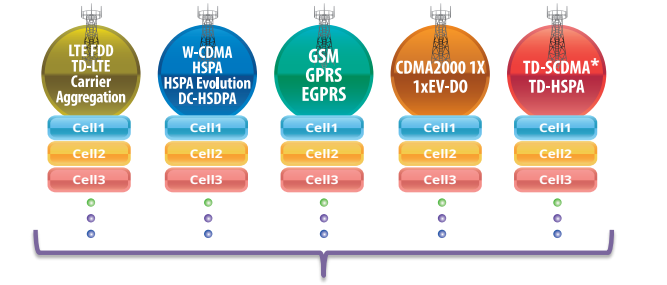
Flexible Base Station Settings

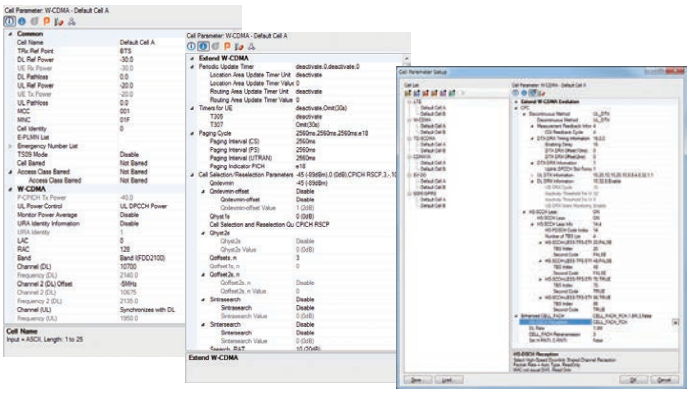
Base station settings are essential for testing UE connections. Not only does SmartStudio support frequency band and Tx and Rx power settings, it can also be set to behave as a real base station.

Setting Base Station Parameters

Cell Parameter Settings

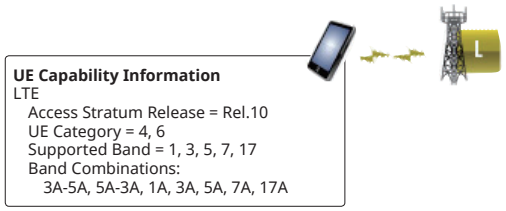
Up to 32 base station parameters can be saved in one file to prevent setting errors and assure fast, smooth testing when making slight changes to frequency and bandwidth before retesting.





At-a-Glance Confirmation of UE Performance

Moving the mouse cursor over the SmartStudio UE icon displays a summary of the UE capability information for easy confirmation of the categories, bands, etc., supported by the UE under test.

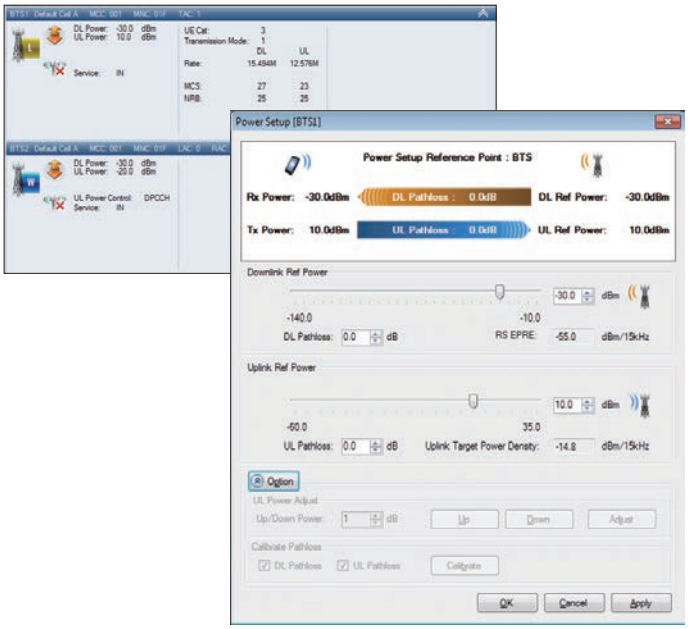


System	Information Element	Example
LTE	Access Stratum Release	Rel.12
	UE Category	4, 6, 9
	Supported Band	1, 2, 3, 4
	Band Combination	1A-2A, 3C
	Band Combination (Rel.11)	1A-2A, 3C
W-CDMA	Access Stratum Release	Rel.10
	HSDPA Category (Rel.7/Rel.8)	10 (14/24)
	HSUPA Category	6
	Supported Band	I, II
TD-SCDMA*	Access Stratum Release	Rel.9
	HSDPA Category	15
	HSUPA Category	6
	Supported Band	a, f
GSM/GPRS	GPRS Multislot Class	12
	EGPRS Multislot Class	12
	Supported Band	GSM E

*: TD-SCDMA/TD-HSPA to be supported by MD8475B in future

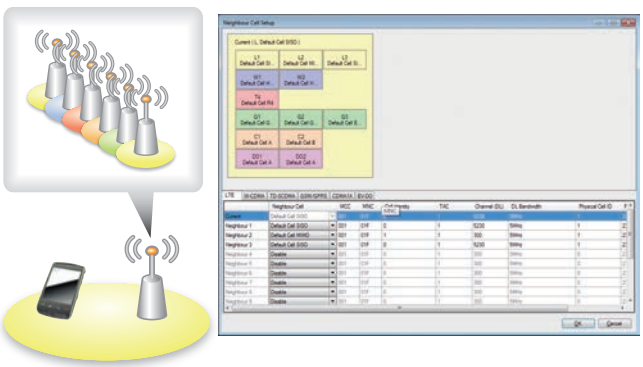
Base Station Power Settings

The Tx/Rx power of the base station can be changed during testing to simulate Out-of-Service tests by stopping RF on Smartstudio.



Setting Neighbor Cells

Neighbor cells can be set to display the mix of multiple cells for a UE graphically.



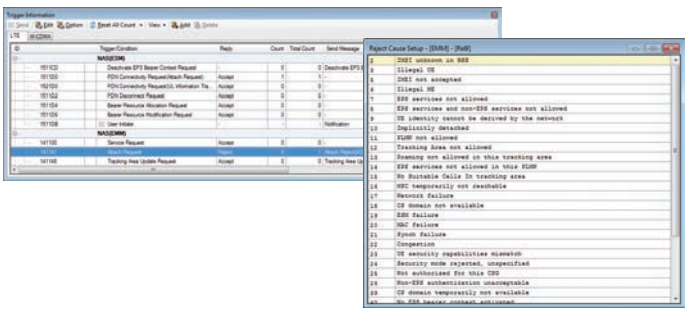
Creating Environment for Difficult Tests on Live Network

Some UE tests cannot be run on a commercial live network and are difficult on a test network.
SmartStudio makes it easy to support these tests.

Reject Tests

Attach Reject/Ignore

By setting specific messages, UE connection request can be rejected when the UE tries to connect the base station.
In addition, the base station ignores messages from the UE by setting 'Ignore', enabling confirmation of the UE behavior when messages are ignored.



Barred Call and Emergency Call Tests

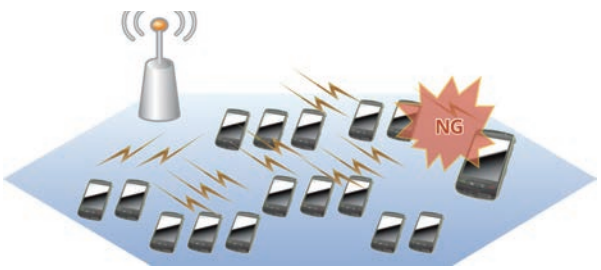
Access Class Control

Sometimes, carriers limit access at events where there are too many people trying to call at once or during abnormally busy times like New Year. SmartStudio can configure an access control test environment, which is difficult to do on a live network.

Emergency Call Test

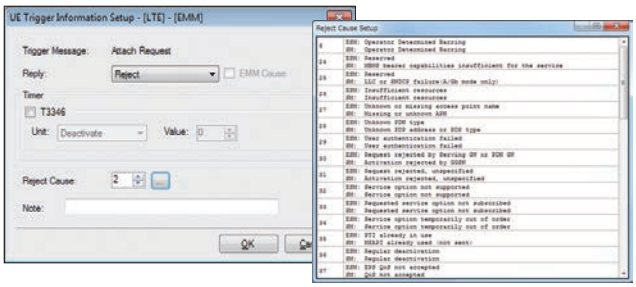
Obviously, emergency calls cannot be tested on a live network but this is an essential test that must be performed. SmartStudio offers emergency call test settings and execution.

System	Control Method	Operation
W-CDMA/ GSM	Not Barred	No Access Control
	Barred	Call barring for all communications
	Emergency	Call barring for communications except emergency call
CDMA2000/ EV-DO	PSIST	Call barring for 1xEV-DO
	ACCT	Call barring for ACCT1X



APN Reject

By setting specific messages, UE connection request can be rejected when the UE connects to the network.

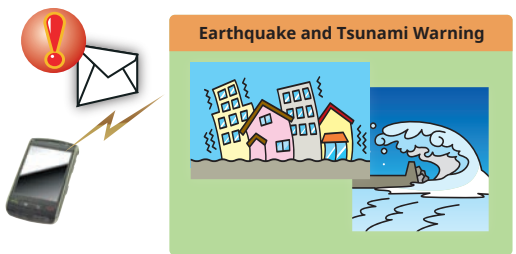


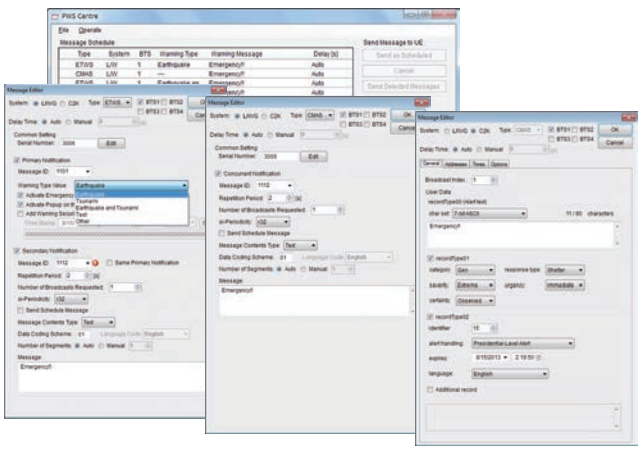
Emergency Alerts Tests

Using the built-in SmartStudio PWS center function supports sending of emergency alerts like earthquake and tsunami warnings to the UE*.
ETWS/CMAS messages can be sent at any timing simply by selecting created/edited messages.

- ETWS (Earthquake and Tsunami Warning System used in Japan)
- CMAS (Commercial Mobile Alert System) North American Federal and state government system for sending standard-format text and audio messages to TV broadcast stations

*: Supports LTE/W-CDMA/CDMA2000/GSM.

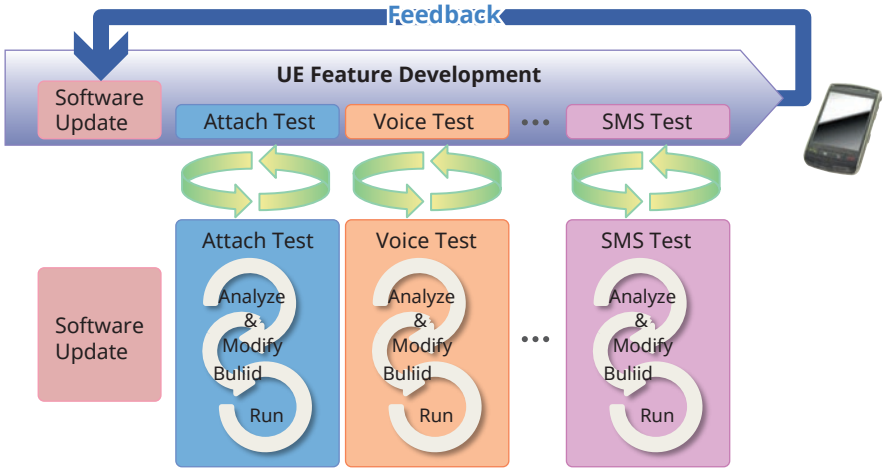




Signalling Tester MD8475A/MD8475B Automation Functions

Regression Tests Necessity

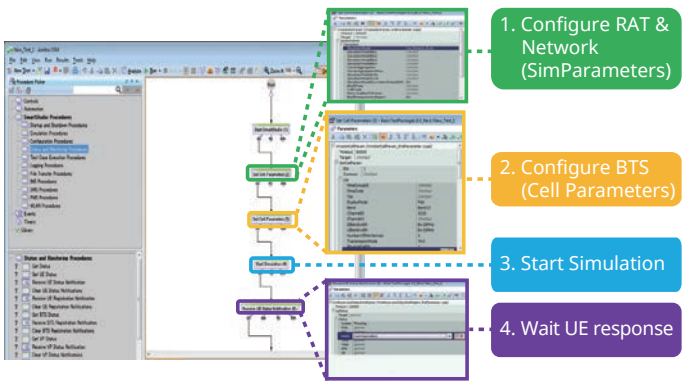
Verification of existing functions and regression testing are key elements of software update testing during UE development. Automated and repeated testing of known items to confirm the absence of new software bugs plays a major role in improving development efficiency and cutting costs.



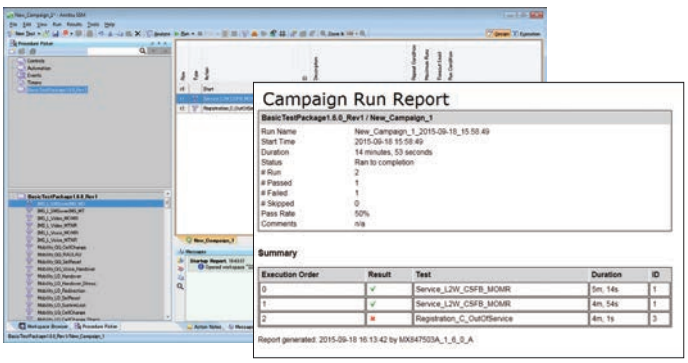
Automated Testing with SmartStudio: SmartStudio Manager MX847503A

The SmartStudio Manager MX847503A software is for editing test sequences and running created test sequences automatically and continuously. This software automates manual testing using the SmartStudio MX847570A software. Automated, unmanned operation test improves efficiency. Additionally, Pass/Fail results can be reported along with the continuous test.

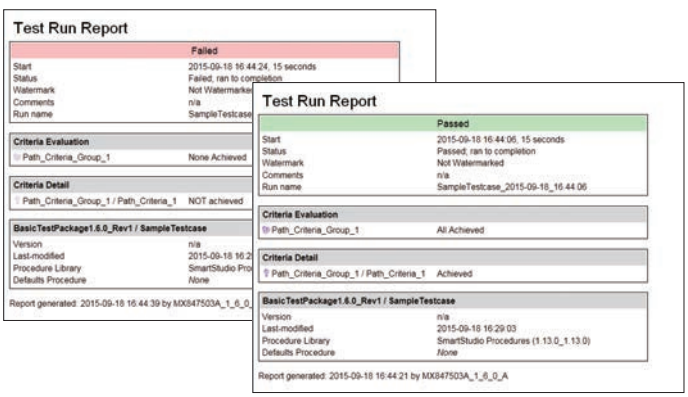
Test Sequence Editing Screen



Test Sequence Continuous Execution Screen



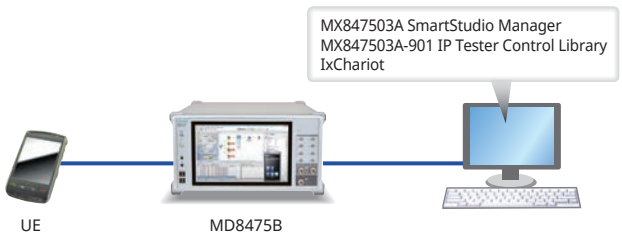
Test Sequence Continuous Execution Results Display



Regression Tests Necessity

Automated Throughput Test: IP Tester Control Library MX847503A-901

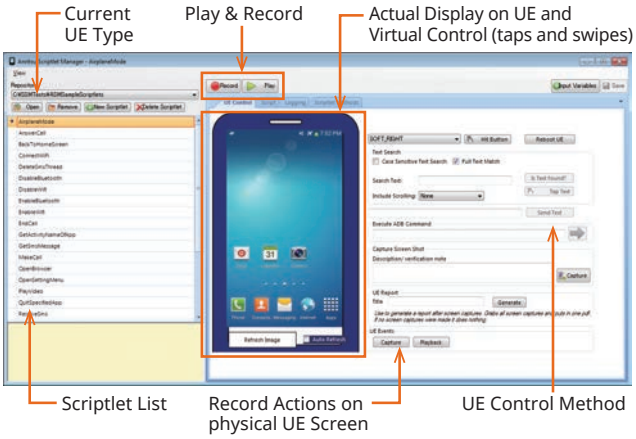
The MX847503A-901 software option controls the IXIA IxChariot remotely to configure a more efficient and flexible automated IP Throughput test environment under various test conditions. Additionally, both MX847503A-901 and IxChariot control console could be accommodated with only one external PC.



IxChariot® is a registered trademark of Ixia.

UE Operation Auto-Recording/Auto-Executing: Smartphone Control Platform MX847504A

The MX847504A software option can records Android OS smartphone operations and offers an environment for creating, editing and running UE automated control scripts. Regression and stable operation confirmation testing of UE are easy using the intuitive editing environment with pre-installed scripts and GUI.



Android™ is a trademark of Google Inc.

Regression Tests and Test Sequences

SmartStudio Manager has various test sequences over 180. These test sequences can be used to confirm basic UE operations, such as making and answering voice calls and SMS messages, as well as measuring throughput. Users can use the AT command interface and Smartphone Control Platform MX847504A to control the UE remotely and perform continuous testing without hands-on UE operation.

Test Sequences (extract)

Category	Procedure	Comment
Registration	Attach	Testing UE and base station registration, etc.
	Out of Service	
Voice/Packet/SMS	Voice	Basic UE tests such as voice, data, CFSB, etc.
	Packet	
	SMS over SGs	
	MOMR/ MTNR CSFB	
PWS	ETWS Primary + Secondary Notification	Emergency message tests
	CMAS Concurrent Notification	
	CMAS	
Cell Barred	Cell Barred	Network restriction tests
	Access Class Barred	
	PSIST	
CS Emergency	CS emergency	Emergency call tests
	CS emergency CSFB	
Stress Test	Voice	Basic function tests and throughput tests
	Handover	
	Throughput testing	
Mobility	Cell Selection/Reselection	Handover tests
	Handover	
	MOMR/MTNR SRVCC	
WLAN Offload	Untrusted non-3GPP access	WLAN Offload tests
	Trusted non-3GPP access	
IMS/RCS	MO/ MT SMS over IMS	IMS/RCS tests
	MOMR: Voice/Video Call Establishment/Release	
	RCS Registration	
TS 09	Stand-by test	TS 09 power consumption tests
	MOMR: Talk time Test	
	MTNR: Talk time Test	
	Packet Switch Transfer Test	
	Browsing Test	
	Streaming Content Test (Video/Audio)	
	Video Telephony Test	
	FTP Download Test	

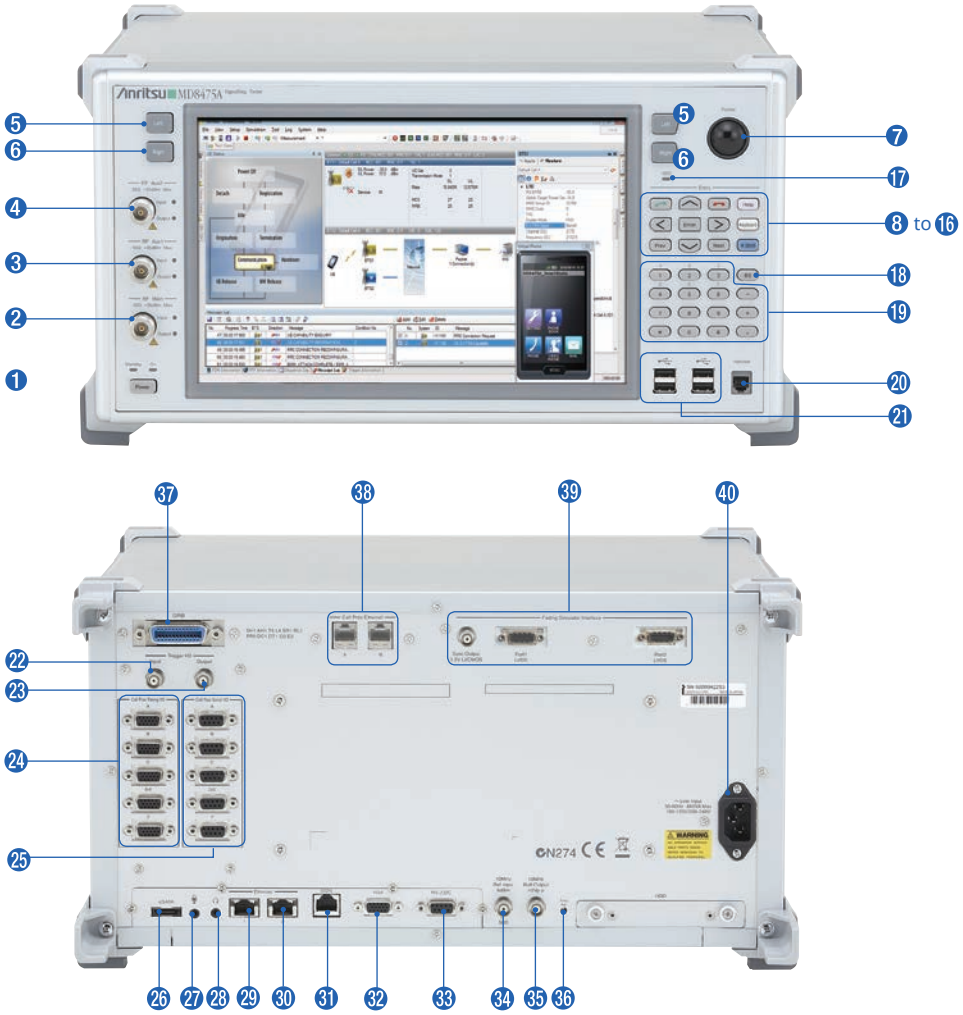
Signalling Tester MD8475A SmartStudio Test Functions

✓: Supported

Function	Description	MD8475A				
		LTE	W-CDMA	GSM	CDMA2000	TD-SCDMA
General						
Position Registration*1	Connects UE and creates test environment	✓	✓	✓	✓	✓
L1/L2 Counter	Counts values for each L1/L2 channel every second	✓	✓	—	—	✓
Throughput Counter	Simultaneously displays PHY layer and IP Throughput (SDU)	✓	✓	✓	—	✓
Trace	Displays events for each layer as arrows	✓	✓	✓	✓	✓
Reject	Returns arbitrary reject message when UE connected	✓	✓	✓	—	✓
Neighbor Cell Setting	Reports information to UE about BTS adjacent to BTS under test	✓	✓	✓	✓	✓
RF Related						
TRx Power Setting	Changes TRx power of BTS during Idle Communication	✓	✓	✓	✓	✓
No Network Setting	Sets BTS Power output to OFF and switches UE to no network status	✓	✓	✓	✓	✓
RF Monitor	Displays frequency, frequency error, and power for each channel such as PDSCH, PUSCH, etc.	✓	✓	✓	—	✓
TPC Setting	Changes TPC (Transmit Power Control) arbitrarily	✓	✓	✓	—	✓
AWGN	Sends AWGN in conjunction with normal signal	✓	✓	—	—	—
RF Measurement Options	Measures UE RF power at each second	✓	✓	✓	—	—
External Control						
Ethernet	Controls SmartStudio operation (parameter selection, start, etc.) from external PC	✓	✓	✓	✓	✓
GPIB	Controls SmartStudio setting parameters from external PC	✓	✓	✓	✓	✓
Voice/Video Communications						
LTE FDD/TDD						
VoLTE/Video Telephony Calling/Answering (Loopback)	Executes call test for UE supporting Voice over LTE/Video over LTE	✓				
Emergency Call/Originating System	Sets emergency call, and VoLTE/Video call control at LTE	✓				
Codec Change	Changes audio and video codecs arbitrarily and executes UE switchover test	✓				
LTE FDD/TDD, W-CDMA, GSM, CDMA2000, TD-SCDMA						
CSFB/eCSFB*2	Auto-switches communication method when other system voice call received during LTE call	✓	✓	✓	✓	✓
SRVCC*2	Performs seamless switch to CS voice call during VoLTE call	✓	✓	✓	—	—
W-CDMA, GSM, CDMA2000, TD-SCDMA						
Voice Call/Answer/On-hook (Loopback/Echoback)	Performs loopback call test*3		✓	✓	✓	✓
Voice Call/Answer/On-hook (Handset)	Performs call test using headset		✓	✓	—	✓
Emergency Call/Originating	Performs emergency call test with and without Test SIM*4		✓	✓	✓	✓
Caller ID Setting	Sets Caller ID notification/non-notification/notification disabled/public phone/international call answer		✓	✓	✓	✓
Call Blocking (Release99) <Barred>	Sets call conditions for Release99 for W-CDMA, GSM, TD-SCDMA and bars all calls		✓	✓		✓
Call Blocking (Release99) <Emergency>	Sets call conditions for Release99 for W-CDMA, GSM, TD-SCDMA and bars all calls except emergency calls		✓	✓		✓
Call Blocking (PSIST/ACCT)	Bars calls for CDMA2000				✓	
W-CDMA, TD-SCDMA						
Videophone Call/Answer/On-hook (Loopback)	Performs loopback call test*3		✓			✓
Packet Data Communications						
IPv4 Packet Test	Performs data TRx using IPv4	✓	✓	✓	✓	✓
IPv6 Packet Test	Performs data TRx using IPv6	✓	✓	✓	✓	✓
Packet Preservation/Dormant Test	Releases RRC Connection while preserving PDP Context	✓	✓	—	✓	✓
Multiple PDP Context/PDN Connect	Connects multiple PDN and performs multisession packet data test	✓	✓	—	✓	—
State Change	Changes state from BTS during packet data communications	✓	✓	—	✓	✓
LTE FDD/TDD						
SISO/MIMO Packet Calling/Answering	Connects server and performs application test using packet data communications	✓				
SISO/MIMO Packet UE Side Disconnect		✓				
SISO/MIMO Packet Network Side Disconnect		✓				
DL2CC Carrier Aggregation	Performs DL2CC carrier application tests	✓*5				
DL3CC Carrier Aggregation	Performs DL3CC carrier application tests	✓*6				
UL2CC Carrier Aggregation	Performs UL2CC carrier application tests	✓*7				
FDD/TDD Joint Operation	Performs FDD and TDD Joint Operation test	✓*6				
W-CDMA						
W-CDMA/HSPA/HSPA Evolution Packet Calling/Answering	Connects server and performs application test using packet data communications		✓			
W-CDMA/HSPA/HSPA Evolution Packet UE Side Disconnect			✓			
W-CDMA/HSPA/HSPA Evolution Packet Network Side Disconnect			✓			
PPP Packet Calling	Performs DL2CC carrier application tests		✓			
PPP Packet UE Side Disconnect	Performs DL3CC carrier application tests		✓			
PPP Packet Network Side Disconnect	Performs UL2CC carrier application tests		✓			
GSM						
GPRS/EGPRS Packet Calling/Answering	Connects server and performs application test using packet data communications			✓		
GPRS/EGPRS Packet UE Side Disconnect				✓		
GPRS/EGPRS Packet Network Side Disconnect				✓		
CDMA2000						
CDMA2000/EV-DO Packet Calling	Connects server and performs application test using packet data communications				✓	
SV-DO Test	Performs simultaneous voice and packet communications				✓	
TD-SCDMA						
TD-SCDMA/HSPA*8 Packet Calling/Answering	Connects server and performs application test using packet data communications					✓
TD-SCDMA/HSPA*8 Packet UE Side Disconnect						✓
TD-SCDMA/HSPA*8 Packet Network Side Disconnect						✓
Messaging						
ETWS Message Sending	Performs ETWS message send test during Idle or Communication state	✓	✓	—	—	—
CMAS Message Sending	Performs CMAS message send test during Idle or Communication state	✓	✓	—	✓	—
CBS Message Sending	Performs CBS message send test during Idle or Communication state	—	✓	✓	—	—
SMS Message Sending/Receiving	Performs SMS (7 bit-ASCII, Unicode, Binary) test using PS and CS networks*3	✓	✓	✓	✓	✓
SMS over IMS Test	Performs SMS send/receive test via IMS server	✓	—	—	—	—
SMS Message Continuous Sending	Sends selected multiple SMS to UE continuously	✓	✓	✓	✓	✓
MMS Sending/Receiving*9	Performs MMS send/receive test	✓	✓	✓	✓	✓

★1: Ciphering function not supported
★2: Only dual system configuration is supported
★3: Two-way tests using two UEs not supported
★4: Test SIM not required by CDMA2000
★5: Requires two MD8475A sets for 2CC MIMO tests
★6: At 3CC SISO/MIMO test and LTE FDD/TDD Joint Operation test using MD8475A, requires separate Signalling Tester MD8430A for linked operation
★7: Throughput limited up to 50 Mbps
★8: DCH Measurement Occasion/Idle Interval Measurement Function are not supported
★9: Requires separate MMS server

Signalling Tester MD8475A Panel Layout



1. **Power switch**
2. **[RF Main] N-type Main I/O connector (N)**
3. **[RF Aux1] N-type auxiliary I/O connector 1 (N)**
4. **[RF Aux2] N-type auxiliary I/O connector 2 (N)**
5. Left **Left keys**
6. Right **Right keys**
7. **[Pointer] Pointer**
8. **Cursor keys**
9. Enter **Enter key**
10. **Off-hook key**
11. **On-hook key**
12. Prev **Prev key**
13. Next **Next key**
14. Help **Help key**
15. Keyboard **Keyboard key**
16. Shift **Shift key**
17. **[HDD] Hard disk access lamp**
18. BS **Backspace key**
19. 0 **Numeric keypad, symbol keys**
20. **[Handset] Handset connector**
21. **[USB] USB connectors**
22. **[Trigger I/O Input] Trigger input connector (BNC)**
23. **[Trigger I/O Output] Trigger output connector (BNC)**
24. **[Call Proc Timing I/O A to F]**
    Timing I/O connectors for call processing (15 Pin Mini D-Sub)
    Shared connectors D/E
25. **[Call Proc Serial I/O A to F]**
    Serial I/O connectors for call processing (9 Pin Mini D-Sub)
    Shared connectors D/E
26. **[eSATA] eSATA connector**
27. **Microphone connector (ø3.5 mm)**
28. **Headphone connector (ø3.5 mm)**
29. **[Ethernet 1] Ethernet 1 connector (RJ-45)**
30. **[Ethernet 0] Ethernet 0 connector (RJ-45)**
31. **[ISDN] ISDN connector (RJ-45) <Option>**
32. **[VGA] VGA connector (15 Pin Mini D-Sub)**
33. **[RS-232C] RS-232C connector (9 Pin Mini D-Sub)**
34. **[10 MHz Ref Input] Reference signal input connector (BNC)**
35. **[10 MHz Buff Output] Reference signal input connector (BNC)**
36. **[Freq Adj] Frequency adjustment**
37. **[GPIB] GPIB connector**
38. **[Call Proc Ethernet] Call Proc Ethernet I/O Port (RJ-45)**
39. **Fading IO connector <Option>**
40. **Power inlet (100 Vac to 120 Vac/200 Vac to 240 Vac)**

Signalling Tester MD8475A System Configurations/Option/Software

Main Frame Options

2nd RF MD8475A-001

This option is required for tests using two RF signals, such as 2-cell and MIMO tests.

Multi-cell Software MX847502A

This option is required when simultaneously activating two cells such as at handover tests within the same system, Inter-RAT tests between different systems, LTE Carrier Aggregation tests, etc. However, it is not required when performing CDMA2000 and EV-DO hybrid tests using one MD8475A.

RF Measurement MX847506A

Installing combinations of the MX847510A, MX847520A, and MX847550A software options supports extended RF Tx power accuracy, RF Rx power, and BLER measurements for each system.

SmartStudio MX847570A

This software supports the user interface for scenario-less testing In addition to offering functions such as sending and receiving SMS messages, sending and receiving ETWS/CMAS messages, making and receiving voice calls, and sending and receiving data packets, it also supports CSCF server functions required for IMS service tests.

Automation Tool

SmartStudio Manager MX847503A

This option increases the efficiency of evaluations by automating manual tests performed by the MX847570A SmartStudio software. In addition, the package includes test sequences required for evaluating basic functions.

IP Test Control Library MX847503A-901

This library option is for remote control of the IXIA IxChariot. Configuring an automated IP Throughput test environment supports efficient verification of smartphone CPU load conditions, power consumption, etc.

eCall Tester Control Library MX847503A-923

This library option is for remote control of tests using the MX703330E eCall tester. Test automation without manual operation increases test efficiency. In addition, it supports the eCall conformance test environment defined in EN16454.

Smartphone Control Platform MX847504A

Recorded via ADB and UE automated control scripts can be created, edited and run. As well as supporting automated control from the MX847503A, two-way automatic control of the measuring instrument and UE supports an operator-free test environment for higher test efficiency.

W-CDMA

- **Basic Configuration (Voice/Video/Packet)**

Multi-signalling Unit MD8475A-070

W-CDMA Simulation Software MX847510A

W-CDMA Option MX847570A-010

These are for basic W-CDMA configuration. These tests support voice, videophone, packet, and SMS tests.

- **Options**

HSPA Option MX847510A-001

This option supports HSPA UE categories defined by the 3GPP Release 5/Release 6 standards.

HSPA Evolution/DC-HSDPA Option MX847510A-011

HSPA Evolution/DC-HSDPA Option MX847570A-011

These options support HSPA Evolution and DC-HSPA packet communications tests for high-speed packet services used by W-CDMA systems.

3GPP TS 25.306 Category List for MX847570A

HSDPA

HS-DSCH Category	HS-DSCH Codes	Minimum Inter-TTI	TB-Sizes	Total Number of Soft Channel Bits	Modulation	Maximum Throughput [bps]
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
12	5	1	3630	28800	QPSK	1815000
13	15	1	35280	259200	Not Applicable (dual cell operation not supported)	17640000
14	15	1	42192	259200		21096000
21	15	1	23370	345600	QPSK/16QAM	23370000
22	15	1	27952	345600	QPSK/16QAM	27952000
23	15	1	35280	518400	QPSK (16QAM)	35280000
24	15	1	42192	518400	64QAM	42192000

HSUPA

E-DCH Category	E-DCH Codes	Minimum Spreading Factor	Support for TTI EDCH	TB-Sizes E-DCH TTI	Maximum Throughput [bps]
3	2	SF4	10 ms TTI	14484	1459500
5	2	SF2	10 ms TTI	20000	2918500
6	4	SF2	10 ms TTI	14484	5760000

*: Not supported when UE specifies a category.

ISDN Interface MD8475A-090

Hardware option adds an ISDN interface (BRI).

- **Support Service**

MX847510A 1Year Support Service MX847510A-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the Web page.

Signalling Tester MD8475A System Configurations/Option/Software

LTE

• Basic Configuration

Multi-signalling Unit MD8475A-070
LTE Simulation Software MX847550A
LTE FDD Option MX847550A-010
LTE TDD Option MX847550A-015
LTE FDD Option MX847570A-050
LTE TDD Option MX847570A-055

These are for basic LTE FDD/TDD configuration. It supports both FDD and TDD technologies. These tests support confirmation of connections with LTE UEs during SISO, packet communications, and SMS sending/receiving. In addition, 2-cell tests are supported by installing the 2-cell Software MX847502A.

3GPP TS 36.306 V12.5.0 (2015-06) Category List

Downlink physical layer parameter values set by the field *ue-Category*

UE DL Category	Maximum number of DL-SCH transport block bits received within a TTI	Maximum number of bits of a DL-SCH transport block received within a TTI	Total number of soft channel bits	Maximum number of supported layers for spatial multiplexing in DL
Category 0	1000	1000	25344	1
Category 1	10296	10296	250368	1
Category 2	51024	51024	1237248	2
Category 3	102048	75376	1237248	2
Category 4	150752	75376	1827072	2
Category 5	299552	149776	3667200	4
Category 6	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
Category 7	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
Category 8	2998560	299856	35982720	8
Category 9	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
Category 10	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
Category 11	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4
Category 12	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4

Uplink physical layer parameter values set by the field *ue-Category*

UE UL Category	Maximum number of UL-SCH transport block bits transmitted within a TTI	Maximum number of bits of an UL-SCH transport block transmitted within a TTI	Support for 64QAM in UL
Category 0	1000	1000	No
Category 1	5160	5160	No
Category 2	25456	25456	No
Category 3	51024	51024	No
Category 4	51024	51024	No
Category 5	75376	75376	Yes
Category 6	51024	51024	No
Category 7	102048	51024	No
Category 8	1497760	149776	Yes
Category 9	51024	51024	No
Category 10	102048	51024	No
Category 11	51024	51024	No
Category 12	102048	51024	No

• Options

LTE 2×2 MIMO Option MX847550A-020

This option adds 2×2 MIMO to the MX847550A. Supported LTE 2×2 MIMO Functions.*

LTE 2×2 MIMO Correspondence Function

	Without 2×2 MIMO option	With 2×2 MIMO option
Transmission Mode	TM1	TM1 ot TM4
Maximum TBS of each subframe	75376	75376 (per CW) 102048 (sum of 2 CWs)

LTE Carrier Aggregation Option MX847550A-040

This software options supports LTE 2CC Carrier Aggregation. It supports the 2CC SISO test environment. Additionally, installing the MX847550A-020 software supports the 2CC MIMO test environment.

LTE Carrier Aggregation DL3CCs Option MX847570A-041

Combining the MD8475A with MD8430A ETM/BTM configuration (sold separately) supports 3CA 2×2 MIMO tests. Both application and function tests can be run under the 3CA SISO/MIMO environment.

Fading IO Option MD8475A-003

This hardware option is required for connecting two MD8475A sets or the combination of one MD8475A and one MD8430A. In addition, combining one MD8475A and one MF6900A Fading Simulator supports configuration of LTE FDD Fading test environment.

LTE RoHC Option MX847550A-060

This option adds better compression algorithms to improve LTE IP packet transfer efficiency.

Supported Profiles

IP	Profile
0x0000	No compression (LTE)/Uncompressed (UMTS)
0x0001	RTP/UDP/IP
0x0002	UDP/IP

• Support Service

MX847550A 1Year Support Service MX847550A-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the Web page.

*: Handover tests not supported when testing 2×2 MIMO.

Signalling Tester MD8475A System Configurations/Option/Software

GSM

• Basic Configuration

GSM Signalling Unit MD8475A-020
GSM/GPRS Simulation Software MX847520A
GSM Option MX847570A-020

This is the basic configuration for performing GSM/GPRS tests. It supports voice and packet communications tests, SMS sending and receiving, etc.

• Options

EGPRS Option MX847520A-001

This option supports EGPRS evaluation — a GPRS high-speed, data communication method. Application tests using EGPRS communications are supported.

Supported EGPRS Specifications

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 Release 99

• Support Service

MX847520A 1Year Support Service MX847520A-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the web page.

CDMA2000

• Basic Configuration

CDMA2000 1X Signalling Unit MD8475A-030
CDMA2000 1xEV-DO Signalling Unit MD8475A-032
CDMA2000 Simulation Software MX847530A
CDMA2000 Option MX847570A-030

This is the basic configuration for performing CDMA2000 1X/1xEV-DO tests. It supports voice (echo-back) and packet communications tests, SMS sending and receiving, etc. Additionally, it can be used to configure a CDMA2000 and 1xEV-DO hybrid environment.

• Options

Multi-sector/Multi-carrier Option MX847530A-001*

This software option supports simulation of various handover tests including Soft, Softer, Hard, Idle, and Access, by dynamically changing the CDMA2000 1X/1xEV-DO multi-carrier (Max. 2) and multi-sector (1X: Max. 6, 1xEV-DO: Max. 3). One MD8475A unit supports testing in multi-carrier/multi-sector environments where verification using a live network is difficult. It improves the efficiency of operation verification, the Inter Operability Test (IOT) at UE R&D, and the field-testing pre-verification.

*: Does not work with MX847570A.

• Support Service

MX847530A 1Year Support Service MX847530A-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the Web page.

TD-SCDMA

• Basic Configuration

TD-SCDMA Signalling Unit MD8475A-040
TD-SCDMA Simulation Software MX847540A
TD-SCDMA Option MX847570A-040

These are for basic TD-SCDMA configuration which support voice, videophone, packet, and SMS tests.

• Options

TD-HSPA Option MX847540A-001

This is for evaluating all 3GPP TS 25.306 HSPA UE categories*1.

3GPP TS 25.306

TD-HSDPA

HS-DSCH category	Maximum number of HSDSCH codes per timeslot	Maximum number of HSDSCH timeslots per TTI	Maximum number of HSDSCH transport channel bits can be received within an HSDSCH TTI	Total number of soft channel bits	Maximum Throughput [bps]
Category 1 to 3	16	2	2788	11264	557600
Category 4 to 6	16	2	5600	22528	1120000
Category 7 to 9	16	3	8416	33792	1688200
Category 10 to 12	16	4	11226	45056	2245200
Category 13 to 15	16	5	14043	56320	2808600

TD-HSUPA

E-DCH category	Maximum number of E-DCH timeslots per TTI	Maximum number of E-DCH transport channel bits that can be received within an E-DCH TTI	Maximum Throughput [bps]
Category 1	2*2	2754	550800
Category 2	3*2	4162	832400
Category 3	2*2	5532	1106400
Category 4	3*2	8348	1669600
Category 5	4*2	11160	2232000
Category 6	5*2	11160	2232000

*1: MX847570A supports Category 6 only.
*2: One timeslot supports two physical channels when 16QAM not used.

• Support Service

MX847540A 1Year Support Service MX847540A-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the Web page.

Signalling Tester MD8475A System Configurations/Option/Software

IMS Options

IMS Script Basic Option MX847570A-060

This software supports scripting of the communication procedure between the test UE and CSCF server using a ladder sequence to provide a very flexible and expandable test environment.

XCAP Script Option MX847570A-061

This option provides a test environment with high flexibility and expandability for creating scripts using a ladder sequence to edit XCAP messages between the UE and server without the need to prepare an actual server.

Extended CSCF Option MX847570A-080

This software option adds functions for calling from the network to the UE as well as extended functions for CSCF-server-side network congestion and no response status.

IMS Supplementary Service Option MX847570A-081

This software option adds other service tests, including VoLTE caller ID display, call forwarding, call holding, etc.

RCS Basic Option MX847570A-083

This software option simulates RCS services. It is used to perform tests including RCS Configuration, Registration, Instant Messaging, etc.

GBA Authentication Option MX847570A-084

This option has the 3GPP GBA Authentication algorithm, authentication procedure and parameter settings for simulating GBA operations.

IMS Early Media Option MX847570A-085

This software supports IMS Early Media sequence tests. It can be used to confirm customized call tone services at the network side, such as NRBT (Network Ring Back Tone) and CAT (Customized Alerting Tone).

- **Support Service**

MX847570A-060 1-Year Technical Support Service MX847570A-TS160

This contract offers customers support for technical enquiries for 1 year.

MX847570A-061 1-Year Technical Support Service MX847570A-TS161

This contract offers customers support for technical enquiries for 1 year.

WLAN Offload Options

WLAN Offload Basic Option MX847570A-070

This software option provides an EAP authentication server for performing EAP over RADIUS communications (EAP-SIM/EAP-AKA) between a WLAN access point and the EAP authentication server. Additionally, data access by the physical bearers is displayed to verify the 3GPP/WLAN switchover.

ePDG Option MX847570A-071

This software option provides an ePDG server for testing the UE functions at Untrusted non-3GPP Access by running IKEv2 key exchanges and IPsec communications between the UE and ePDG. It requires the MX847570A-070 option as well.

ANDSF Option MX847570A-072

This software option provides the ANDSF function for testing the UE functions after ANDSF policy distribution to the UE. It requires the MX847570A-070 options as well.

Extended ePDG Option MX847570A-073

This software option supports configuration of an ePDG status fault test environment for inserting errors into the ePDG sequence, setting timeouts, etc. Additionally, this option can be used to support Fast Re-Authentication (EAP-SIM/EAP-AKA) tests without the need to generate UE-side authentication keys. It requires the MX847570A-070/MX847570A-071.

eCall Options

eCall Tester (Perpetual License) MX703330E-PL010

This option simulates the PSAP used by eCall services to support the eCall sequence (MSD call → Voice call) between the IVS and PSAP at a road accident.
The following test standards are supported:

- TS 26 .267 V8.6.0 (2011-03)
- TS 26 .268 V8.6.0 (2011-03)
- EN15722: 2011
- EN16062: 2011
- EN16454: 2013
- ISO3779: 2009

MSD ERA GLONASS Option MX703330E-031

This option supports the MSD data communications function over SMS used by the ERA-GLONASS system
The following test standards are supported:

- GOST R 54619-2011
- GOST R 54620-2011
- GOST R 54721-2011
- GOST R 55530-2013

- **Support Service**

MX703330E 1-Year Technical Support Service MX703330E-TS110

This contract offers customers support for technical enquiries for 1 year.

Signalling Tester MD8475A System Configurations/Option/Software

Scenario Tools

SIDE Software MX847580A
LTE FDD/W-CDMA/GSM Option MX847580A-050
SIP Option MX847580A-018

These software are for executing scenarios created using the MX843080A Scenario Integrated Development Environment in combination with the MX847510A, MX847520A, and MX847550A software.

CDMA2000 Scenario Composer MX702600B
MX702600B 1 Year Support Service MX702600B-SS110

This software creates CDMA2000 test scenarios using a ladder sequence design. The created test scenarios can be executed using the PVT (Protocol Visualization Tool) provided with the MX847530A software.

Ciphering Option

W-CDMA Ciphering Option MX847510A-050

This option adds the W-CDMA ciphering function*1, *2 and supports for KASUMI (3GPP-recommended algorithm).

GSM/GPRS Ciphering Option MX847520A-050

This option adds the GSM/GPRS ciphering function*1, *2 and supports both the GSM A5/1, A5/2, and A5/3 ciphering algorithms as well as the GPRS GEA/1, GEA/2, and GEA/3 ciphering algorithms.

TD-SCDMA Ciphering Option MX847540A-050

This option adds the TD-SCDMA ciphering function*1, *2 and supports SNOW 3G (3GPP-recommended algorithm).

LTE Ciphering Option MX847550A-050

This option adds the LTE ciphering function*1, *2 and supports SNOW 3G (3GPP-recommended algorithm) and AES.

*1: Does not work with MX847570A.
*2: The Integrity Algorithm does not require this option.

Signalling Tester MD8475A SmartStudio System Configuration

<table>
<tr><th colspan="2" rowspan="2">System</th><th colspan="2">LTE</th><th rowspan="2">W-CDMA</th><th rowspan="2">TD-SCDMA</th><th rowspan="2">GSM</th><th rowspan="2">CDMA2000</th></tr>
<tr><th>FDD</th><th>TDD</th></tr>
<tr><td colspan="2">Unit</td><td colspan="6">Signalling Tester MD8475A</td></tr>
<tr><td colspan="2" rowspan="2">Unit Option</td><td colspan="6">2nd RF MD8475A-001</td></tr>
<tr><td colspan="6">Fading IO Option MD8475A-003</td></tr>
<tr><td colspan="2">Platform Software</td><td colspan="6">Multi-cell Software MX847502A</td></tr>
<tr><td rowspan="4">Basic Configuration</td><td rowspan="2">Hardware</td><td colspan="3" rowspan="2">Multi Signalling Unit
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Signalling Unit
MD8475A-040</td><td rowspan="2">GSM Signalling Unit
MD8475A-020</td><td>CDMA2000 1X
Signalling Unit
MD8475A-030</td></tr>
<tr><td>CDMA2000 1xEV-DO
Signalling Unit
MD8475A-032</td></tr>
<tr><td colspan="2">—</td><td>ISDN Interface
MD8475A-090</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>Software</td><td colspan="2">LTE Simulation Software
MX847550A
LTE FDD Option
MX847550A-010
LTE TDD Option
MX847550A-015</td><td>W-CDMA
Simulation Software
MX847510A</td><td>TD-SCDMA
Simulation Software
MX847540A</td><td>GSM/GPRS
Simulation Software
MX847520A</td><td>CDMA2000
Simulation Software
MX847530A</td></tr>
<tr><td colspan="2" rowspan="5">Options</td><td colspan="2">LTE 2×2 MIMO Option
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MX847510A-001</td><td rowspan="4">TD-HSPA
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Option
MX847520A-001</td><td rowspan="4">Multi-Sector/
Multi-Carrier Option
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<tr><td colspan="2">LTE Carrier Aggregation Option
MX847550A-040</td></tr>
<tr><td colspan="2">LTE Carrier Aggregation DL3CCs Option
MX847550A-041</td><td rowspan="2">HSPA Evolution/
DC-HSDPA Option
MX847510A-011</td></tr>
<tr><td colspan="2">LTE RoHC Option MX847550A-060</td></tr>
<tr><td colspan="2">LTE Ciphering Option MX847550A-050</td><td>W-CDMA
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Ciphering Option
MX847540A-050</td><td>GSM/GPRS
Ciphering Option
MX847520A-050</td><td>—</td></tr>
<tr><td colspan="2">Support Service</td><td colspan="2">MX847550A
1Year Support Service
MX847550A-SS110</td><td>MX847510A
1Year Support Service
MX847510A-SS110</td><td>MX847540A
1Year Support Service
MX847540A-SS110</td><td>MX847520A
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MX847520A-SS110</td><td>MX847530A
1Year Support Service
MX847530A-SS110</td></tr>
<tr><td colspan="2">User Interface</td><td colspan="6">SmartStudio MX847570A</td></tr>
<tr><td rowspan="13">SmartStudio License</td><td rowspan="2">System Option</td><td>LTE FDD Option
MX847570A-050</td><td>LTE TDD Option
MX847570A-055</td><td>W-CDMA Option
MX847570A-010
HSPA Evolution/
DC-HSDPA Option
MX847570A-011</td><td>TD-SCDMA Option
MX847570A-040</td><td>GSM Option
MX847570A-020</td><td>CDMA2000 Option
MX847570A-030</td></tr>
<tr><td rowspan="5">IMS</td><td colspan="5">Extended CSCF Option MX847570A-080</td></tr>
<tr><td colspan="5">IMS Supplementary Service Option MX847570A-081</td></tr>
<tr><td colspan="5">RCS Basic Option MX847570A-083</td></tr>
<tr><td colspan="5">GBA Authentication Option MX847570A-084</td></tr>
<tr><td colspan="5">IMS Early Media Option MX847570A-085</td></tr>
<tr><td rowspan="4">WLAN</td><td colspan="5">WLAN Offload Basic Option MX847570A-070</td></tr>
<tr><td colspan="5">ePDG Option MX847570A-071</td></tr>
<tr><td colspan="5">ANDSF Option MX847570A-072</td></tr>
<tr><td colspan="5">Extended ePDG Option MX847570A-073</td></tr>
<tr><td rowspan="2">Scripting Option</td><td colspan="5">IMS Script Basic Option MX847570A-060</td></tr>
<tr><td colspan="5">XCAP Script Option MX847570A-061</td></tr>
<tr><td rowspan="2">Technical Support Service</td><td colspan="5">MX847570A-060 1 Year Technical Support Service MX847570A-TS160</td></tr>
<tr><td colspan="5">MX847570A-061 1 Year Technical Support Service MX847570A-TS161</td></tr>
<tr><td colspan="2">RF Measurement</td><td colspan="3">RF Measurement MX847506A</td><td>—</td><td>RF Measurement
MX847506A</td><td>—</td></tr>
<tr><td colspan="2" rowspan="4">Remote Interface</td><td colspan="6">SmartStudio Manager MX847503A</td></tr>
<tr><td colspan="6">IP Tester Control Library MX847503A-901</td></tr>
<tr><td colspan="6">eCall Tester Control Library MX847503A-923</td></tr>
<tr><td colspan="6">Smartphone Control Platform MX847504A</td></tr>
<tr><td colspan="2" rowspan="3">eCall Option</td><td colspan="3">eCall Tester (Perpetual License) MX703330E</td><td>—</td><td>eCall Tester
(Perpetual License)
MX703330E</td><td>—</td></tr>
<tr><td colspan="3">MSD ERA GLONASS Option MX703330E-031</td><td>—</td><td>MSD ERA GLONASS
Option
MX703330E-031</td><td>—</td></tr>
<tr><td colspan="3">MX703330E 1 Year Technical Support Service MX703330E-TS110</td><td>—</td><td>MX703330E
1 Year Technical
Support Service
MX703330E-TS110</td><td>—</td></tr>
</table>

Signalling Tester MD8475A Specifications

RF Connector	RF Input/Output connector (Main, Aux 1, Aux 2) Connector: N type, Impedance: 50Ω, VSWR: ≤1.5 (500 MHz to 3 GHz) Reference oscillator Frequency: 10 MHz Level: TTL level Connector: BNC type Startup characteristics: $\pm 5 \times 10^{-8}$ (10 minutes after power-on, referenced to frequency 24 hours after power-on) Aging rate: 2×10^{-8}/day, $\leq 1 \times 10^{-7}$/year (referenced to frequency 24 hours after power-on) Temperature characteristics: $\leq \pm 2 \times 10^{-8}$ External reference input Frequency: 10 MHz, Acceptable frequency range: ±0.5 ppm, Level: ≥0 dBm, Impedance: 50Ω, Connector: BNC type
Transmission Characteristics	Frequency Frequency range: 350 MHz to 3.6 GHz Setting resolution: 100 kHz (Depending on MX847501A used) Accuracy: Based on reference oscillator accuracy Output level Level range: –130 to –10 dBm (Main, Aux1, Aux2) Resolution: 0.1 dB Transmission level ±1.0 dB (–120 dBm ≤ Output level, 350 MHz ≤ Frequency ≤ 3 GHz, +20° to +30°C, after CAL) ±1.2 dB (–120 dBm ≤ Output level, 3 GHz < Frequency ≤ 3.6 GHz, +20° to +30°C, after CAL) Signal purity Non-harmonic spurious: ≤–40 dBc (at ≥500 kHz frequency offset) Harmonics: ≤–25 dBc
Reception Characteristics	Frequency Frequency range: 350 MHz to 3.6 GHz Setting resolution: 100 kHz (Depending on MX847501A used) Level Maximum input level: +35 dBm (Average) Input level range: –60 to +35 dBm (with MD8475A-010, MD8475A-011, MD8475A-030, MD8475A-032, MD8475A-050, MD8475A-070) –30 to +40 dBm (in-burst average power) (with MD8475A-020) Reference level: –60 to +35 dBm Reception level (with MX847506A) MX847510A ±1.1 dB (–60 to +35 dBm, 350 MHz ≤ Frequency ≤ 3 GHz, +20° to +30°C, after CAL) ±1.3 dB (–60 to +35 dBm, 3 GHz < Frequency ≤ 3.6 GHz, +20° to +30°C, after CAL) MX847520A ±1.1 dB (–30 to +40 dBm, 350 MHz ≤ Frequency ≤ 3 GHz, +20° to +30°C, after CAL) ±1.3 dB (–30 to +40 dBm, 3 GHz < Frequency ≤ 3.6 GHz, +20° to +30°C, after CAL) MX847550A ±1.1 dB (–50 to +35 dBm, 350 MHz ≤ Frequency ≤ 3 GHz, +20° to +30°C, after CAL) ±1.3 dB (–50 to +35 dBm, 3 GHz < Frequency ≤ 3.6 GHz, +20° to +30°C, after CAL) ±2.0 dB (–60 to +35 dBm, 350 MHz ≤ Frequency ≤ 3.6 GHz, after CAL) Variable range Rx level setting resolution: 1 dB
General	Display: Color TFT LCD screen, 12.1 inches (wide type), 1280 × 800 dots External interface Trigger I/O: BNC Call Proc Timing I/O: 15-pin mini D-Sub connector Call Proc Serial I/O: D-sub connector, RS-232C level Call Proc Ethernet A/B: RJ-45 connector, 10Base-T/100Base-TX/1000Base-T Handset: RJ-11 connector Headphone: 3.5-mm dia. headphone jack Microphone: 3.5-mm dia. microphone jack USB: Type A, 4 ports RS-232C: D-sub connector, conforms to RS-232C GPIB: IEEE488 connector VGA: Mini D-Sub connector Ethernet 0/1: RJ-45 connector 10Base-T/100Base-TX/1000Base-T
Power Supply	100 Vac to 120 Vac (±10%)/200 Vac to 240 Vac (–15%/+10%, Max.: 250 Vac), 50 Hz to 60 Hz (Rating), ≤600 VA (Max.)
Dimensions and Mass	426 (W) × 221.5 (H) × 398 (D) mm (excl. protrusions), <25 kg (with all options)
Temperature Range & Humidity	Operation: +5° to +40°C, Storage: –20° to +60°C, ≤90% (no condensation)
EMC	EN 61326-1, EN 61000-3-2
LVD	EN 61010-1

Signalling Tester MD8475A Ordering Information

Signalling Tester MD8475A

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
	Main frame
MD8475A	Signalling Tester
	Standard accessories
MX847500A	Platform Software (Factory-installed)
MX847501A	Control Software (Factory-installed)
J0017F	Power Cord, 2.6 m
	MD8475A CD-ROM (Operation manual)
P0035B	W-CDMA/GSM Test USIM (Standard UICC size)
P0035B7	W-CDMA/GSM Test USIM (Micro UICC Size)
J1440A	LAN Cable (3 m)
Z0541A	USB Mouse
Z0975A	Keyboard (USB)
A0058A	Handset
	Hardware option
MD8475A-001	2nd RF
	Software options
MX847502A	Multi-cell Software
MX847506A	RF Measurement
	User interface
MX847570A	SmartStudio
MX847570A-010	W-CDMA Option
MX847570A-011	HSPA Evolution/DC-HSDPA Option
MX847570A-020	GSM Option
MX847570A-030	CDMA2000 Option
MX847570A-040	TD-SCDMA Option
MX847570A-050	LTE FDD Option
MX847570A-055	LTE TDD Option
MX847570A-060	IMS Script Basic Option
MX847570A-061	XCAP Script Option
MX847570A-070	WLAN Offload Basic Option
MX847570A-071	ePDG Option
MX847570A-072	ANDSF Option
MX847570A-073	Extended ePDG Option
MX847570A-080	Extended CSCF Option
MX847570A-081	IMS Supplementary Service Option
MX847570A-083	RCS Basic Option
MX847570A-084	GBA Authentication Option
MX847570A-085	IMS Early Media Option
	LTE system
MD8475A-070	Multi-signalling Unit
MX847550A	LTE Simulation Software
MX847550A-010	LTE FDD Option
MX847550A-015	LTE TDD Option
MX847550A-020	LTE 2×2 MIMO Option
MX847550A-040	LTE Carrier Aggregation Option
MX847550A-041	LTE Carrier Aggregation DL3CCs Option
MX847550A-060	LTE RoHC Option
MD8475A-003	Fading IO Option
	W-CDMA system
MD8475A-070	Multi-signalling Unit
MX847510A	W-CDMA Simulation Software
MX847510A-001	HSPA Option
MX847510A-011	HSPA Evolution/DC-HSDPA Option
MD8475A-090	ISDN Interface
	GSM system
MD8475A-020	GSM Signalling Unit
MX847520A	GSM/GPRS Simulation Software
MX847520A-001	EGPRS Option

Model/Order No.	Name
	CDMA2000 system
MD8475A-030	CDMA2000 1X Signalling Unit
MD8475A-032	CDMA2000 1xEV-DO Signalling Unit
MX847530A	CDMA2000 Simulation Software
MX847530A-001	Multi-sector/Multi-carrier Option
	TD-SCDMA system
MD8475A-040	TD-SCDMA Signalling Unit
MX847540A	TD-SCDMA Simulation Software
MX847540A-001	TD-HSPA Option
	Automation tools
MX847503A	SmartStudio Manager
MX847503A-901	IP Tester Control Library
MX847503A-923	eCall Tester Control Library
MX847504A	Smartphone Control Platform
Z1813A	USB Dongle (Automation)
	Scenario tools
MX847580A	SIDE Execution Software
MX847580A-018	SIP Execution Option
MX702600B	CDMA2000 Scenario Composer
	Auto Motive applications
MX703330E-PL010	eCall Tester (Perpetual License)
MX703330E-031	MSD ERA GLONASS Option
	Ciphering Options
MX847510A-050	W-CDMA Ciphering Option
MX847520A-050	GSM/GPRS Ciphering Option
MX847540A-050	TD-SCDMA Ciphering Option
MX847550A-050	LTE Ciphering Option
	Software support services
MX847510A-SS110	MX847510A 1Year Support Service
MX847520A-SS110	MX847520A 1Year Support Service
MX847530A-SS110	MX847530A 1Year Support Service
MX847540A-SS110	MX847540A 1Year Support Service
MX847550A-SS110	MX847550A 1Year Support Service
MX702600B-SS110	MX702600B 1Year Support Service
	Technical support services
MX847570A-TS160	MX847570A-060 1 Year Technical Support Service
MX847570A-TS161	MX847570A-061 1Year Technical Support Service
MX703330E-TS110	MX703330E 1 Year Technical Support Service
	Warranty
MD8475A-ES210	2 Years Extended Warranty Service
MD8475A-ES310	3 Years Extended Warranty Service
MD8475A-ES510	5 Years Extended Warranty Service

Signalling Tester MD8475A

Model/Order No.	Name
	Application parts
41KC-3	Fixed Attenuator 3 dB
B0655A	Rack Mount Kit
B0329D	Front Cover for 1MW 5U
J0004	Coaxial Adaptor (N (male)-SMA (female))
J0127A	Coaxial Cord, 1.0 m (BNC-P · RG58A/U · BNC-P)
J0127B	Coaxial Cord, 2.0 m (BNC-P · RG58A/U · BNC-P)
J0576B	Coaxial Cord, 1.0 m (N-P · 5D-2W · N-P)
J0576D	Coaxial Cord, 2.0 m (N-P · 5D-2W · N-P)
J0658	Adapter (SMA male-female L-type)
J1262A	RS-232C Cable (Straight 2 m, male-female)
J1262B	RS-232C Cable (Crossover 2 m, male-female)
J1263	W-CDMA Interface Cable (UE connection cable)
J1265	Adapter (Serial connector, male-male)
J1287	HDD-SUB15P Cable (milli-inch, for connecting MN8110B)
J1333A	HDD-SUB15P Crossover Cable (inch)
J1334A	CDMA2000 Cable
J1416A	LVDS Cable
J1440A	LAN Cable
J1524A	Dsub15-BNC Conversion Cable
J1549A	LTE-C2K Sync Cable
J1605A	MD8475A 3GPP Sync Cable
J1609A	Signal Divider
J1610A	MD8475A 2CC MIMO Connect Cable Kit
J1651A	MD8475A Sync In Cable (for 3CC Test)
P0035B	W-CDMA/GSM Test USIM (Standard UICC Size)
P0035B7	W-CDMA/GSM Test USIM (Micro UICC Size)
P0135A6	Anritsu Test UICC GA (nano UICC Size)
P0135A7	Anritsu Test UICC GA (Micro UICC Size)
P0135B6	Anritsu Test UICC GA (nano UICC Size)
P0135B7	Anritsu Test UICC GA (Micro UICC Size)
P0250A6	Anritsu Test UICC GT (nano UICC Size)
P0250A7	Anritsu Test UICC GT (Micro UICC Size)
P0250B6	Anritsu Test UICC GT (nano UICC Size)
P0250B7	Anritsu Test UICC GT (Micro UICC Size)
P0260A6	Anritsu Test UICC GM (nano UICC Size)
P0260A7	Anritsu Test UICC GM (Micro UICC Size)
P0260B6	Anritsu Test UICC GM (nano UICC Size)
P0260B7	Anritsu Test UICC GM (Micro UICC Size)
Z0749	MN8110B + Inch Screw Cable (for call processing I/O)
Z1908B	Standard Laptop for SSM
Z1919A	Standard Desktop for WLAN

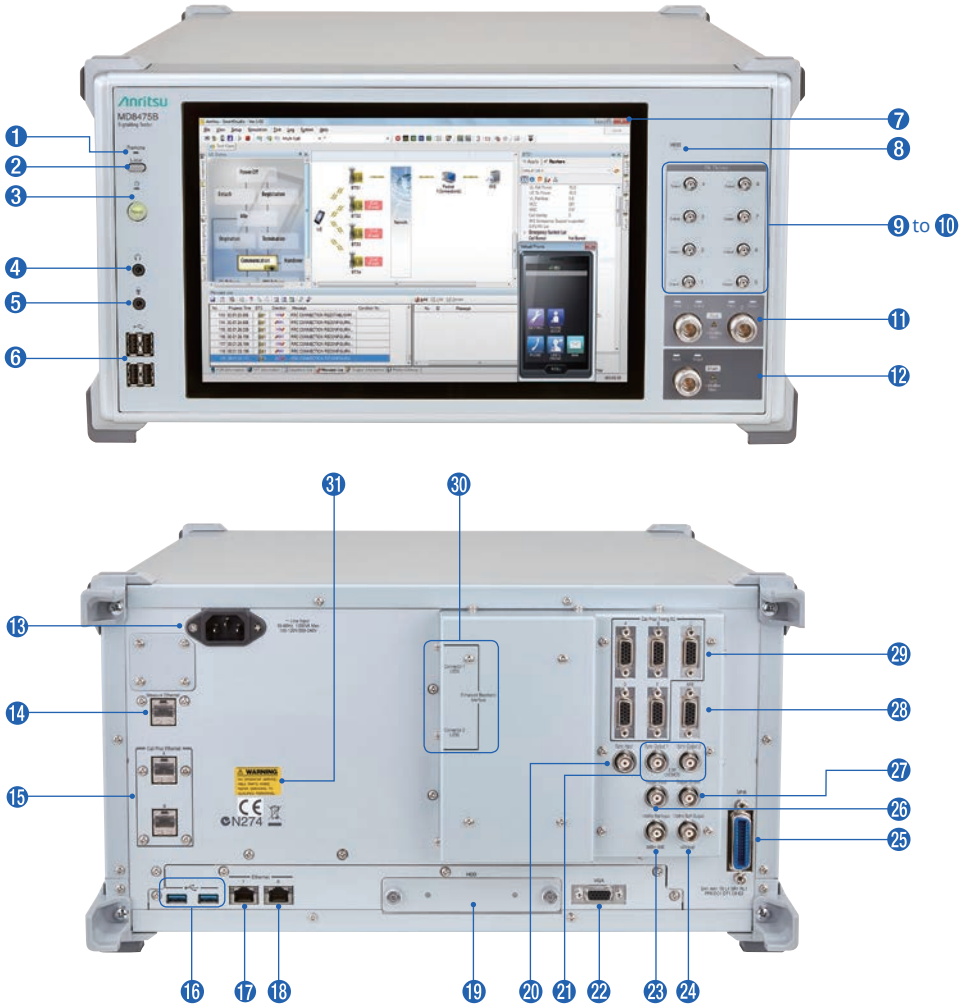
Signalling Tester MD8475B SmartStudio Test Functions

✓: Supported

Function	Description	MD8475B				
		LTE	W-CDMA	GSM	CDMA2000	TD-SCDMA
General						
Position Registration*1	Connects UE and creates test environment	✓	✓	✓	✓	—*2
L1/L2 Counter	Counts values for each L1/L2 channel every second	✓	✓	—	—	—*2
Throughput Counter	Simultaneously displays PHY layer and IP Throughput (SDU)	✓	✓	✓	—	—*2
Trace	Displays events for each layer as arrows	✓	✓	✓	✓	—*2
Reject	Returns arbitrary reject message when UE connected	✓	✓	✓	—	—*2
Neighbor Cell Setting	Reports information to UE about BTS adjacent to BTS under test	✓	✓	✓	✓	—*2
RF Related						
TRx Power Setting	Changes TRx power of BTS during Idle Communication	✓	✓	✓	✓	—*2
No Network Setting	Sets BTS Power output to OFF and switches UE to no network status	✓	✓	✓	✓	—*2
RF Monitor	Displays frequency, frequency error, and power for each channel such as PDSCH, PUSCH, etc.	✓	✓	✓	—	—*2
TPC Setting	Changes TPC (Transmit Power Control) arbitrarily	✓	✓	✓	—	—*2
AWGN	Sends AWGN in conjunction with normal signal	✓	✓	—	—	—
RF Measurement Options	Measures UE RF power at each second	—*3	—*3	—*3	—	—
External Control						
Ethernet	Controls SmartStudio operation (parameter selection, start, etc.) from external PC	✓	✓	✓	✓	—*2
GPIB	Controls SmartStudio setting parameters from external PC	✓	✓	✓	✓	—*2
Voice/Video Communications						
LTE FDD/TDD						
VoLTE/Video Telephony Calling/Answering (Loopback)	Executes call test for UE supporting Voice over LTE/Video over LTE	✓				
Emergency Call/Originating System	Sets emergency call, and VoLTE/Video call control at LTE	✓				
Codec Change	Changes audio and video codecs arbitrarily and executes UE switchover test	✓				
LTE FDD/TDD, W-CDMA, GSM, CDMA2000, TD-SCDMA						
CSFB/eCSFB*4	Auto-switches communication method when other system voice call received during LTE call	✓	✓	✓	✓	—*2
SRVCC*4	Performs seamless switch to CS voice call during VoLTE call	✓	✓	✓	—	—
W-CDMA, GSM, CDMA2000, TD-SCDMA						
Voice Call/Answer/On-hook (Loopback/Echoback)	Performs loopback call test*3		✓	✓	✓	—*2
Voice Call/Answer/On-hook (Handset)	Performs call test using headset		✓	✓	—	—*2
Emergency Call/Originating	Performs emergency call test with and without Test SIM*4		✓	✓	✓	—*2
Caller ID Setting	Sets Caller ID notification/non-notification/notification disabled/public phone/international call answer		✓	✓	✓	—*2
Call Blocking (Release99) <Barred>	Sets call conditions for Release99 for W-CDMA, GSM, TD-SCDMA and bars all calls		✓	✓		—*2
Call Blocking (Release99) <Emergency>	Sets call conditions for Release99 for W-CDMA, GSM, TD-SCDMA and bars all calls except emergency calls		✓	✓		—*2
Call Blocking (PSIST/ACCT)	Bars calls for CDMA2000				✓	
W-CDMA, TD-SCDMA						
Videophone Call/Answer/On-hook (Loopback)	Performs loopback call test*3		✓			—*2
Packet Data Communications						
IPv4 Packet Test	Performs data TRx using IPv4	✓	✓	✓	✓	—*2
IPv6 Packet Test	Performs data TRx using IPv6	✓	✓	✓	✓	—*2
Packet Preservation/Dormant Test	Releases RRC Connection while preserving PDP Context	✓	✓	—	✓	—*2
Multiple PDP Context/PDN Connect	Connects multiple PDN and performs multisession packet data test	✓	✓	—	✓	—
State Change	Changes state from BTS during packet data communications	✓	✓	—	✓	—*2
IP Data Traffic Functions	Uses built-in packet generator to implement simple measurement system with automated high-reproducibility data throughput test	✓	✓	✓	✓	—*2
LTE FDD/TDD						
SISO/MIMO Packet Calling/Answering	Connects server and performs application test using packet data communications	✓				
SISO/MIMO Packet UE Side Disconnect		✓				
SISO/MIMO Packet Network Side Disconnect		✓				
DL2CC Carrier Aggregation	Performs DL2CC carrier application tests	✓				
DL3CC Carrier Aggregation	Performs DL3CC carrier application tests	✓				
DL4CC Carrier Aggregation	Performs DL4CC carrier application tests	✓				
UL2CC Carrier Aggregation	Performs UL2CC carrier application tests	✓*7				
FDD/TDD Joint Operation	Performs FDD and TDD Joint Operation test	—*8				
W-CDMA						
W-CDMA/HSPA/HSPA Evolution Packet Calling/Answering	Connects server and performs application test using packet data communications		✓			
W-CDMA/HSPA/HSPA Evolution Packet UE Side Disconnect			✓			
W-CDMA/HSPA/HSPA Evolution Packet Network Side Disconnect			✓			
PPP Packet Calling	Performs DL2CC carrier application tests		✓			
PPP Packet UE Side Disconnect	Performs DL3CC carrier application tests		✓			
PPP Packet Network Side Disconnect	Performs UL2CC carrier application tests		✓			
GSM						
GPRS/EGPRS Packet Calling/Answering	Connects server and performs application test using packet data communications			✓		
GPRS/EGPRS Packet UE Side Disconnect				✓		
GPRS/EGPRS Packet Network Side Disconnect				✓		
CDMA2000						
CDMA2000/EV-DO Packet Calling	Connects server and performs application test using packet data communications				✓	
SV-DO Test	Performs simultaneous voice and packet communications				✓	
TD-SCDMA						
TD-SCDMA/HSPA*10 Packet Calling/Answering	Connects server and performs application test using packet data communications					—*2
TD-SCDMA/HSPA*10 Packet UE Side Disconnect						—*2
TD-SCDMA/HSPA*10 Packet Network Side Disconnect						—*2
Messaging						
ETWS Message Sending	Performs ETWS message send test during Idle or Communication state	✓	✓	—	—	—
CMAS Message Sending	Performs CMAS message send test during Idle or Communication state	✓	✓	—	✓	—
CBS Message Sending	Performs CBS message send test during Idle or Communication state	—	✓	✓	—	—
SMS Message Sending/Receiving	Performs SMS (7 bit-ASCII, Unicode, Binary) test using PS and CS networks*5	✓	✓	✓	✓	—*2
SMS over IMS Test	Performs SMS send/receive test via IMS server	✓	—	—	—	—
SMS Message Continuous Sending	Sends selected multiple SMS to UE continuously	✓	✓	✓	✓	—*2
MMS Sending/Receiving*9	Performs MMS send/receive test	✓	✓	✓	✓	—*2

★1: Ciphering function not supported
★2: TD-SCDMA/TD-HSPA to be supported by MD8475B in future
★3: RF power measurement function to be supported by MD8475B in future
★4: Only dual system configuration supported
★5: Two-way tests using two UEs not supported
★6: Test SIM not required by CDMA2000
★7: Limited to 50 Mbps throughput
★8: LTE FDD/TDD Joint Operation to be supported by MD8475B in future
★9: Requires separate MMS server
★10: DCH Measurement Occasion/Idle Interval Measurement function not supported

Signalling Tester MD8475B Panel Layout



1. Remote lamp
2. Local key
3. Power switch
4. Headphone jack
5. Microphone jack
6. USB connectors
7. Display
8. Hard disk access lamp
9. SMA-type DL Output 1/2/5/6 connector
10. SMA-type DL Output 3/4/7/8 connector
11. N-type Main I/O connector
12. N-type auxiliary I/O 1/2 connector
13. Power inlet
14. Ethernet I/O connector for Measure
15. Call Proc Ethernet I/O connectors
16. USB connectors
17. Ethernet 1 connector
18. Ethernet 0 connector
19. Hard disk
20. Sync Input connector
21. Sync Output connectors
22. VGA connector
23. Reference signal input connector
24. Reference signal output connector
25. GPIB connector
26. Trigger output connector
27. Trigger input connector
28. ARB I/O connector
29. Timing I/O connectors for call processing
30. Enhanced Baseband Interface connectors
31. Safety label

Signalling Tester MD8475B System Configurations/Option/Software

Main Frame Options

Extended RF MD8475B-002

This option is required to simulate the operation of three or more base-station cells. It supports 8Tx/4RX using the MD8475B.

Fading IO Option MD8475B-004

Combining the Signalling Tester MD8430A with the fading option and the MD8475B supports configuration of a fading test environment.

Multi-cell Software MX847502B

This option is required when simultaneously activating two or more cells such as at handover tests within the same system, Inter-RAT tests between different systems, LTE Carrier Aggregation tests, etc. However, it is not required when performing CDMA2000 and EV-DO hybrid tests using one MD8475B.

Multimedia Interface Software MX847508B

This option is required when performing end-to-end voice tests with microphones and speakers (headset) connected to the MD8475B. It can be used for W-CDMA and GSM AMR-NB (AMR Narrowband), GSM EFR (Enhanced Full Rate Speech), FR (Full Rate Speech), and HR (Half Rate Speech) codecs.

AMR-WB MX847508B-001

This option supports the W-CDMA AMR-WB (AMR Wideband) codec. It requires the MX847508B.

Supported voice codec list

Supported Codecs	Multimedia Interface Software MX847508B	AMR-WB MX847508B-001
AMR-NB (W-CDMA/GSM)	✓	-
GSM-EFR (GSM)	✓	-
GSM-FR (GSM)	✓	-
GSM-HR (GSM)	✓	-
AMR-WB (W-CDMA)	Not supported	✓

SmartStudio MX847570B

This software supports the user interface for scenario-less testing. In addition to offering functions such as sending and receiving SMS messages, sending and receiving ETWS/CMAS messages, making and receiving voice calls, and sending and receiving data packets, it also supports CSCF server functions required for IMS service tests.

- **Support Service**

MX847570B 1Year Support Service MX847570B-SS110

This service contract offers customers 1 year of support for technical enquiries as well as updates to the latest software versions adding extra functionality and bug fixes via downloads from the Web page.

W-CDMA

- **Basic Configuration (Voice/Video/Packet)**

Multi-signalling Unit MD8475B-070
W-CDMA Simulation Software MX847510B
W-CDMA Option MX847570B-010

These are for basic W-CDMA configuration. These tests support voice, videophone, packet, and SMS tests.

- **Options**

HSPA Evolution/DC-HSDPA Option MX847510B-011
HSPA Evolution/DC-HSDPA Option MX847570B-011

These options support HSPA Evolution and DC-HSPA packet communications tests for high-speed packet services used by W-CDMA systems.

3GPP TS 25.306 Category List for MX847570A

HSDPA

HS-DSCH Category	HS-DSCH Codes	Minimum Inter-TTI	TB-Sizes	Total Number of Soft Channel Bits	Modulation	Maximum Throughput [bps]
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
12	5	1	3630	28800	QPSK	1815000
13	15	1	35280	259200	Not Applicable (dual cell operation not supported)	17640000
14	15	1	42192	259200		21096000
21	15	1	23370	345600	QPSK/16QAM	23370000
22	15	1	27952	345600	QPSK/16QAM	27952000
23	15	1	35280	518400	QPSK/16QAM	35280000
24	15	1	42192	518400	64QAM	42192000

HSUPA

E-DCH Category	E-DCH Codes	Minimum Spreading Factor	Support for TTI EDCH	TB-Sizes E-DCH TTI	Maximum Throughput [bps]
3	2	SF4	10 ms TTI	14484	1459500
5	2	SF2	10 ms TTI	20000	2918500
6	4	SF2	10 ms TTI	14484	5760000

*: Not supported when UE specifies a category

Signalling Tester MD8475B System Configurations/Option/Software

LTE

• Basic Configuration

Multi-signalling Unit MD8475B-070
LTE Simulation Software MX847550B
LTE Option MX847570B- 050

These are for basic LTE FDD/TDD configuration. It supports both FDD and TDD technologies. These tests support confirmation of connections with LTE UEs during SISO, packet communications, and SMS sending/receiving. In addition, multi-cell tests are supported by installing the Multi-cell Software MX847502B.

3GPP TS 36.306 V12.5.0 (2015-06) Category List

Downlink physical layer parameter values set by the field UE-Category

UE DL Category	Maximum number of DL-SCH transport block bits received within a TTI	Maximum number of bits of a DL-SCH transport block received within a TTI	Total number of soft channel bits	Maximum number of supported layers for spatial multiplexing in DL
Category 0	1000	1000	25344	1
Category 1	10296	10296	250368	1
Category 2	51024	51024	1237248	2
Category 3	102048	75376	1237248	2
Category 4	150752	75376	1827072	2
Category 5	299552	149776	3667200	4
Category 6	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
Category 7	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
Category 8	2998560	299856	35982720	8
Category 9	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
Category 10	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
Category 11	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4
Category 12	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4

Uplink physical layer parameter values set by the field UE-Category

UE UL Category	Maximum number of UL-SCH transport block bits transmitted within a TTI	Maximum number of bits of an UL-SCH transport block transmitted within a TTI	Support for 64 QAM in UL
Category 0	1000	1000	No
Category 1	5160	5160	No
Category 2	25456	25456	No
Category 3	51024	51024	No
Category 4	51024	51024	No
Category 5	75376	75376	Yes
Category 6	51024	51024	No
Category 7	102048	51024	No
Category 8	1497760	149776	Yes
Category 9	51024	51024	No
Category 10	102048	51024	No
Category 11	51024	51024	No
Category 12	102048	51024	No

• Options

LTE 2×2 MIMO Option MX847550B-020

This option adds 2×2 MIMO to the MX847550B.

Supported LTE 2×2 MIMO Functions

	Without 2×2 MIMO option	With 2×2 MIMO option
Transmission Mode	TM1	TM1 to TM4
Maximum TBS of each subframe	75376	75376 (per CW) 102048 (sum of 2 CWs)

LTE Carrier Aggregation Option MX847550B-040

This software options supports LTE 2CC Carrier Aggregation. It supports the 2CC SISO test environment. Additionally, installing the MX847550B-020 software supports the 2CC MIMO test environment.

LTE Carrier Aggregation DL3CCs Option MX847550B-041

This software option supports LTE 3CC Carrier Aggregation. It supports the 3CC SISO test environment. Additionally, installing the MX847550B-020 software supports the 3CC MIMO test environment.

LTE Carrier Aggregation DL4CCs Option MX847550B-042

This software option supports LTE 4CC Carrier Aggregation. It supports the 4CC SISO test environment. Additionally, installing the MX847550B-020 software supports the 4CC MIMO test environment.

LTE RoHC Option MX847550B-060

This option adds better compression algorithms to improve LTE IP packet transfer efficiency.

Supported Profiles

IP	Profile
0x0000	No compression (LTE)/Uncompressed (UMTS)
0x0001	RTP/UDP/IP
0x0002	UDP/IP

Signalling Tester MD8475B System Configurations/Option/Software

GSM

- **Basic Configuration**

GSM Signalling Unit MD8475B-020
GSM/GPRS Simulation Software MX847520B
GSM Option MX847570B-020

This is the basic configuration for performing GSM/GPRS tests.
It supports voice and packet communications tests, SMS sending and receiving, etc. Additionally, it can be used for evaluating application functions using EGPRS communications for EGPRS high-speed data communications.

Supported EGPRS Specifications

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 Release 99

CDMA2000

- **Basic Configuration**

CDMA2000 1X Signalling Unit MD8475B-030
CDMA2000 1xEV-DO Signalling Unit MD8475B-032
CDMA2000 Simulation Software MX847530B
CDMA2000 Option MX847570B-030

This is the basic configuration for performing CDMA2000 1X/1xEV-DO tests. It supports voice (echo-back) and packet communications tests, SMS sending and receiving, etc.
Additionally, it can be used to configure a CDMA2000 1X and 1xEV-DO hybrid environment.

IMS Options

IMS Script Basic Option MX847570B-060

This software supports scripting of the communication procedure between the test UE and CSCF server using a ladder sequence to provide a very flexible and expandable test environment.

XCAP Script Option MX847570B-061

This option provides a test environment with high flexibility and expandability for creating scripts using a ladder sequence to edit XCAP messages between the UE and server without the need to prepare an actual server.

Extended CSCF Option MX847570B-080

This software option adds functions for calling from the network to UE as well as extended functions for CSCF-server-side network congestion and no response status.

IMS Supplementary Service Option MX847570B-081

This software option adds other service tests, including VoLTE caller ID display, call forwarding, call holding, etc.

RCS Basic Option MX847570B-083

This software option simulates RCS services. It is used to perform tests including RCS Configuration, Registration, Instant Messaging, etc.

GBA Authentication Option MX847570B-084

This option has the 3GPP GBA Authentication algorithm, authentication procedure and parameter settings for simulating GBA operations.

IMS Early Media Option MX847570B-085

This software supports IMS Early Media sequence tests. It can be used to confirm customized call tone services at the network side, such as NRBT (Network Ring Back Tone) and CAT (Customized Alerting Tone).

- **Support Service (IMS options)**

MX847570B-060 1-Year Technical Support Service MX847570B-TS160

This contract offers customers support for technical enquiries for 1 year.

MX847570B-061 1 Year Technical Support Service MX847570B-TS161

This contract offers customers support for technical enquiries for 1 year.

Signalling Tester MD8475B System Configurations/Option/Software

WLAN Offload Options

WLAN Offload Basic Option MX847570B-070

This software option provides an EAP authentication server for performing EAP over RADIUS communications (EAP-SIM/EAP- AKA) between a WLAN access point and the EAP authentication server. Additionally, data access by the physical bearers is displayed to verify the 3GPP/WLAN switchover.

ePDG Option MX847570B-071

This software option provides an ePDG server for testing the UE functions at Untrusted non-3GPP Access by running IKEv2 key exchanges and IPsec communications between the UE and ePDG. It requires the MX847570B-070 option as well.

ANDSF Option MX847570B-072

This software option provides the ANDSF function for testing the UE functions after ANDSF policy distribution to the UE. It requires the MX847570B-070 options as well.

Extended ePDG Option MX847570B-073

This software option supports configuration of an ePDG status fault test environment for inserting errors into the ePDG sequence, setting timeouts, etc. Additionally, this option can be used to support Fast Re-Authentication (EAP-SIM/EAP-AKA) tests without the need to generate UE-side authentication keys. It requires the MX847570B-070/ MX847570B-071.

Upgrade Kits*

MD8475A to MD8475B Upgrade MD8475B-UG101
MD8475A to MD8475B Upgrade (with Ciphering) MD8475B-UG102
MD8475A to MD8475B Upgrade MD8475B-UG201
MD8475A to MD8475B Upgrade (with Ciphering) MD8475B-UG202

These retrofit kits upgrade the MD8475A in use to the MD8475B.

MSU Upgrade MD8475B-UG170
MSU Upgrade MD8475B-UG270

When upgrading the MD8475A in use to the MD8475B specifications, if a legacy unit such as the MD8475A-010 or MD8475A-040 is installed that cannot be transferred to the MD8475B-050 Multi-signalling Unit, the legacy unit must be changed to the MD8475B-050 with these retrofit kits.

*: Upgrade kit models vary according to the configuration of the MD8475A options in use; contact our sales section for more details.

Automation Tool

SmartStudio Manager MX847503A

This option increases the efficiency of evaluations by automating manual tests performed by the MX847570B SmartStudio software. In addition, the package includes test sequences required for evaluating basic functions.

IP Tester Control Library MX847503A-901

This library option is for remote control of the IXIA IxChariot. Configuring an automated IP Throughput test environment supports efficient verification of smartphone CPU load conditions, power consumption, etc.

Smartphone Control Platform MX847504A

Using this option, Android OS smartphone operations can be recorded via ADB and UE automated control scripts can be created, edited and run. As well as supporting automated control from the MX847503A, two-way automatic control of the measuring instrument and UE supports an operator-free test environment for higher test efficiency.

Signalling Tester MD8475B SmartStudio System Configuration

<table>
<tr><td colspan="2" rowspan="2">System</td><td colspan="2">LTE</td><td rowspan="2">W-CDMA</td><td rowspan="2">GSM</td><td rowspan="2">CDMA2000</td></tr>
<tr><td>LTE-A</td><td>LTE</td></tr>
<tr><td colspan="2">Unit</td><td colspan="5">Signalling Tester MD8475B</td></tr>
<tr><td colspan="2" rowspan="2">Unit Option</td><td colspan="5">Extended RF MD8475B-002</td></tr>
<tr><td colspan="5">Fading IO Option MD8475B-004</td></tr>
<tr><td colspan="2" rowspan="3">Platform Software</td><td colspan="5">Multi-cell Software MX847502B</td></tr>
<tr><td colspan="2">—</td><td colspan="2">Multimedia Interface Software MX847508B</td><td>—</td></tr>
<tr><td colspan="2">—</td><td>AMR-WB
MX847508B-001</td><td></td><td>—</td></tr>
<tr><td rowspan="3">Basic Configuration</td><td rowspan="2">Hardware</td><td colspan="3">Multi Signalling Unit MD8475B-070</td><td>GSM Signalling Unit
MD8475B-020</td><td>CDMA2000 1X
Signalling Unit
MD8475B-030</td></tr>
<tr><td colspan="2">—</td><td>—</td><td>—</td><td>CDMA2000 1xEV-DO
Signalling Unit
MD8475B-032</td></tr>
<tr><td>Software</td><td colspan="2">LTE Simulation Software MX847550B</td><td>W-CDMA
Simulation Software
MX847510B</td><td>GSM/GPRS
Simulation Software
MX847520B</td><td>CDMA2000
Simulation Software
MX847530B</td></tr>
<tr><td colspan="2" rowspan="5">Options</td><td colspan="2">LTE 2×2 MIMO Option MX847550B-020</td><td rowspan="5">HSPA Evolution/
DC-HSDPA Option
MX847510B-011</td><td rowspan="5">—</td><td rowspan="5">—</td></tr>
<tr><td>LTE Carrier Aggregation Option
MX847550B-040</td><td rowspan="3">—</td></tr>
<tr><td>LTE Carrier Aggregation DL3CCs Option
MX847550B-041</td></tr>
<tr><td>LTE Carrier Aggregation DL4CCs Option
MX847550B-042</td></tr>
<tr><td colspan="2">LTE RoHC Option MX847550B-060</td></tr>
<tr><td colspan="2">Support Service</td><td colspan="5">MX847570B 1 Year Support Service MX847570B-SS110</td></tr>
<tr><td colspan="2">User Interface</td><td colspan="5">SmartStudio MX847570B</td></tr>
<tr><td colspan="2" rowspan="12">SmartStudio Licence</td><td rowspan="2">System Option</td><td colspan="2">LTE Option MX847570B-050</td><td>W-CDMA Option
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<tr><td colspan="5">ePDG Option MX847570B-071</td></tr>
<tr><td colspan="5">ANDSF Option MX847570B-072</td></tr>
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<tr><td rowspan="2">Scripting Option</td><td colspan="5">IMS Script Basic Option MX847570B-060</td></tr>
<tr><td colspan="5">XCAP Script Option MX847570B-061</td></tr>
<tr><td rowspan="2">Technical Support Service</td><td colspan="5">MX847570B-060 1 Year Technical Support Service MX847570B-TS160</td></tr>
<tr><td colspan="5">MX847570B-061 1 Year Technical Support Service MX847570B-TS161</td></tr>
<tr><td colspan="2" rowspan="3">Remote Interface</td><td colspan="5">SmartStudio Manager MX847503A</td></tr>
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</table>

Signalling Tester MD8475B Specifications

RF Connector	RF Input/Output connector (Main, Aux 1, Aux 2) Connector: N (j) type, Impedance: 50Ω VSWR (Main): ≤1.9 (350 MHz to 3.8 GHz), ≤2.0 (3.8 GHz to 6.0 GHz) VSWR (Aux1, 2): ≤1.5 (350 MHz to 3.8 GHz), ≤1.6 (3.8 GHz to 6.0 GHz) Output connector (DL Output 1 to 8) Connector: SMA (j) type, Impedance: 50Ω VSWR: ≤1.5 (350 MHz to 3.8 GHz), ≤1.6 (3.8 GHz to 6.0 GHz) Reference oscillator Frequency: 10 MHz Level: TTL level Connector: BNC (j) type Startup characteristics: $\leq 5 \times 10^{-8}$ (10 minutes after power-on, referenced to frequency 24 hours after power-on) Aging rate: 2×10^{-8}/day, $\leq 1 \times 10^{-7}$/year (referenced to frequency 24 hours after power-on) Temperature characteristics: $\leq 5 \times 10^{-8}$ Frequency Accuracy at Shipment: $\pm 2.2 \times 10^{-8}$ (At +20° to +30°C, 1 hour after power-up) External reference input Frequency: 10 MHz, Acceptable frequency range: ±1.0 ppm, Level: ≥0 dBm, Impedance: 50Ω, Connector: BNC (j) type
Transmission Characteristics	Frequency Frequency range: 350 MHz to 6.0 GHz Setting resolution: 100 kHz (Depending on MX847501B used) Accuracy: Based on reference oscillator accuracy Output level Level range: (Main, Aux1, Aux2): LTE : –130 to –27 dBm (350 MHz to 3.8 GHz), –130 to –32 dBm (3.8 GHz to 6.0 GHz) W-CDMA : –130 to –27 dBm (350 MHz to 3.6 GHz) Others: –130 to –25 dBm (350 MHz to 3.6 GHz) Level Range (DL Output 1 to 8): LTE : –115 to –5 dBm (350 MHz to 3.8 GHz), –115 to –10 dBm (3.8 GHz to 6.0 GHz) W-CDMA: –115 to –5 dBm (350 MHz to 3.6 GHz) Others: –115 to –3 dBm (350 MHz to 3.6 GHz) Resolution: 0.1 dB Level Accuracy (Main): –120 dBm ≤ Output Level, after CAL, excluding other effects of internal signal generator ±1.7 dB (350 MHz to 3.8 GHz, +20° to +30°C) ±2.0 dB (3.8 GHz to 6.0 GHz, +20° to +30°C) Level Accuracy (Aux 1, Aux 2): –120 dBm ≤ Output Level, after CAL, excluding other effects of internal signal generator ±1.0 dB ±1.0 dB (350 MHz to 3.8 GHz, +20° to +30°C) ±1.3 dB (3.8 GHz to 6.0 GHz, +20° to +30°C) Level Accuracy (DL Output 1 to 8): –110 dBm ≤ Output Level, after CAL ±1.0 dB (350 MHz to 3.8 GHz, +20° to +30°C) ±1.3 dB (3.8 GHz to 6.0 GHz, +20° to +30°C) Signal purity Non-harmonic spurious: ≤–30 dBc (at ≥100 kHz frequency offset) Harmonics: ≤–25 dBc Modulation Accuracy : At +20° to +30°C W-CDMA: ≤3.5%rms (350 MHz to 2.7 GHz) GSM: ≤1.5°rms (350 MHz to 2.7 GHz) CDMA2000 1x: p >0.995 (400 MHz to 2.7 GHz, Pilot Channel) CDMA2000 1xEV-DO: p >0.995 (400 MHz to 2.7 GHz, Pilot Channel) LTE: ≤3.5%rms (400 MHz to 6.0 GHz)
Reception Characteristics	Frequency Frequency range: 350 MHz to 6.0 GHz Setting resolution: 100 kHz (Depending on MX847501B used) Level Maximum input level: +35 dBm (Average)
General	Display: Color TFT LCD screen, 12.1 inches (WXGA), 1280 × 800 dots External interface Trigger I/O: BNC (j) Call Processing Timing I/O: 15-pin mini D-Sub (f) connector Call Processing Ethernet A/B: RJ-45 connector, 10Base-T/100Base-TX/1000Base-T Measure Ethernet: RJ-45 connector, 10Base-T/100Base-TX/1000Base-T Headphone: 3.5-mm dia. headphone jack Microphone: 3.5-mm dia. microphone jack USB (Type-A) × 2 (Back Panel) USB (Type-A) × 4 (Front Panel) GPIB: IEEE488 connector VGA: Mini D-Sub connector Ethernet 0/1: RJ-45 connector, 10Base-T/100Base-TX/1000Base-T ARB : Mini D-sub connector Sync Input: BNC (j) x 1, Output : BNC (j) ×2
Power Supply	100 Vac to 120 Vac (±10%)/200 Vac to 240 Vac (–10%/+10%, Max.: 250 Vac), 50 Hz to 60 Hz (Rating), ≤1350 VA (Max.)
Dimensions and Mass	426 (W) × 221.5 (H) × 578 (D) mm (excl. protrusions), <40 kg (with all options)
Temperature Range & Humidity	Operation: +5° to +40°C, Storage: –20° to +60°C, ≤90% (no condensation)
EMC	EN 61326-1, EN 61000-3-2
LVD	EN 61010-1

Signalling Tester MD8475B Ordering Information

Signalling Tester MD8475B

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
	Main frame
MD8475B	Signalling Tester
	Standard accessories
MX847500B	Platform Software
MX847501B	Control Software
J1211	POWER CORD.3M
P0031A	USB Memory
P0035B	W-CDMA/GSM Test USIM (Standard UICC size)
P0035B7	W-CDMA/GSM Test USIM (Micro UICC Size)
J1440A	LAN Cable (3 m)
Z0541A	USB Mouse
Z0975A	Keyboard (USB)
A0131A	Handset
	Hardware options
MD8475B-002	Extended RF
MD8475B-004	Fading IO Option
	Software options
MX847502B	Multi-cell Software
MX847508B	Multimedia Interface Software
MX847508B-001	AMR-WB
	User interface
MX847570B	SmartStudio
MX847570B-010	W-CDMA Option
MX847570B-011	HSPA Evolution/DC-HSDPA Option
MX847570B-020	GSM Option
MX847570B-030	CDMA2000 Option
MX847570B-050	LTE Option
MX847570B-051	LTE Carrier Aggregation Option
MX847570B-060	IMS Script Basic Option
MX847570B-061	XCAP Script Option
MX847570B-070	WLAN Offload Basic Option
MX847570B-071	ePDG Option
MX847570B-072	ANDSF Option
MX847570B-073	Extended ePDG Option
MX847570B-080	Extended CSCF Option
MX847570B-081	IMS Supplementary Service Option
MX847570B-083	RCS Basic Option
MX847570B-084	GBA Authentication Option
MX847570B-085	IMS Early Media Option
	LTE system
MD8475B-070	Multi-signalling Unit
MX847550B	LTE Simulation Software
MX847550B-020	LTE 2×2 MIMO Option
MX847550B-040	LTE Carrier Aggregation Option
MX847550B-041	LTE Carrier Aggregation DL3CCs Option
MX847550B-042	LTE Carrier Aggregation DL4CCs Option
MX847550B-060	LTE RoHC Option
	W-CDMA system
MD8475B-070	Multi-signalling Unit
MX847510B	W-CDMA Simulation Software
MX847510B-011	HSPA Evolution/DC-HSDPA Option
	GSM system
MD8475B-020	GSM Signalling Unit
MX847520B	GSM/GPRS Simulation Software
	CDMA2000 system
MD8475B-030	CDMA2000 1X Signalling Unit
MD8475B-032	CDMA2000 1xEV-DO Signalling Unit
MX847530B	CDMA2000 Simulation Software

Model/Order No.	Name
	Automation tools
MX847503A	SmartStudio Manager
MX847503A-901	IP Tester Control Library
MX847504A	Smartphone Control Platform
Z1813A	USB Dongle (Automation)
	Software support services
MX847570B-SS110	MX847570B 1Year Support Service
	Technical support services
MX847570B-TS160	MX847570B-060 1 Year Technical Support Service
MX847570B-TS161	MX847570B-061 1 Year Technical Support Service
	Upgrade kits*
MD8475B-UG□01	MD8475A to MD8475B Upgrade
MD8475B-UG□02	MD8475A to MD8475B Upgrade (with Ciphering)
MD8475B-UG□70	MSU Upgrade
	Warranty
MD8475B-ES210	2 Years Extended Warranty Service
MD8475B-ES310	3 Years Extended Warranty Service
MD8475B-ES510	5 Years Extended Warranty Service
	Application parts
B0703A	Rack Mount Kit
B0726A	Carrying Case
J0004	Coaxial Adaptor (N (male)-SMA (female))
J0127A	Coaxial Cord, 1.0 m (BNC-P · RG58A/U · BNC-P)
J0127B	Coaxial Cord, 2.0 m (BNC-P · RG58A/U · BNC-P)
J0322B	Coaxial Cord, 1.0 m
J0322D	Coaxial Cord, 2.0 m
J0658	Adapter (SMA male-female L-type)
J0576B	Coaxial Cord, 1.0 m (N-P · 5D-2W · N-P)
J0576D	Coaxial Cord, 2.0 m (N-P · 5D-2W · N-P)
J1263	W-CDMA Interface Cable (UE connection cable)
J1287	HDD-SUB15P Cable (milli-inch, for connecting MN8110B)
J1333A	HDD-SUB15P Crossover Cable (inch)
J1416A	LVDS Cable
J1440A	LAN Cable
J1489A	PP2S OUTPUT CABLE
J1524A	Dsub15-BNC Conversion Cable
J1609A	Signal Divider
J1651A	MD8475A Sync In Cable (for 3CC Test)
P0035B	W-CDMA/GSM Test USIM (Standard UICC Size)
P0035B7	W-CDMA/GSM Test USIM (Micro UICC Size)
P0135A6	Anritsu Test UICC GA (nano UICC Size)
P0135A7	Anritsu Test UICC GA (Micro UICC Size)
P0250A6	Anritsu Test UICC GT (nano UICC Size)
P0250A7	Anritsu Test UICC GT (Micro UICC Size)
P0260A6	Anritsu Test UICC GM (nano UICC Size)
P0260A7	Anritsu Test UICC GM (Micro UICC Size)
Z0749	MN8110B + Inch Screw Cable (for call processing I/O)
Z1908B	Standard Laptop for SSM
Z1919A	Standard Desktop for WLAN

*: MD8475B-UG □ ##
□: Select from the following according to the option type.
1: Retrofit option (Must be returned to factory in Japan)
2: Retrofit option (Must be returned to service center outside of Japan)

Note:

Note:

Note:

Anritsu envision : ensure

Specifications are subject to change without notice.

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

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

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

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

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

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

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

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

• Sweden
Anritsu AB
Kistagången 20B, 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
Kay Fiskers Plads 9, 2300 Copenhagen S, Denmark
Phone: +45-7211-2200
Fax: +45-7211-2210

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

• Spain
Anritsu EMEA Ltd.
Representation Office in Spain
Edificio Cuzco IV, Po. de la Castellana, 141, Pta. 5
28046, Madrid, Spain
Phone: +34-915-726-761
Fax: +34-915-726-621

• United Arab Emirates
Anritsu EMEA Ltd.
Dubai Liaison Office
902, Aurora Tower,
P O Box: 500311- Dubai Internet City
Dubai, United Arab Emirates
Phone: +971-4-3758479
Fax: +971-4-4249036

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

• Singapore
Anritsu Pte. Ltd.
11 Chang Charn Road, #04-01, Shriro House
Singapore 159640
Phone: +65-6282-2400
Fax: +65-6282-2533

• P.R. China (Shanghai)
Anritsu (China) Co., Ltd.
Room 2701-2705, Tower A,
New Caohejing International Business Center
No. 391 Gui Ping Road Shanghai, 200233, P.R. China
Phone: +86-21-6237-0898
Fax: +86-21-6237-0899

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

• Japan
Anritsu Corporation
8-5, Tamura-cho, Atsugi-shi, Kanagawa, 243-0016 Japan
Phone: +81-46-296-6509
Fax: +81-46-225-8359

• Korea
Anritsu Corporation, Ltd.
5FL, 235 Pangyoyeok-ro, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13494 Korea
Phone: +82-31-696-7750
Fax: +82-31-696-7751

• Australia
Anritsu Pty. Ltd.
Unit 20, 21-35 Ricketts Road,
Mount Waverley, Victoria 3149, 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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