/Inritsu 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?

Q.2 Do you know any complex measurement scenarios that are required for most base station simulators?

yes

no

yes

no

yes

Q.3 Does your base station simulator
meet the latest communications standards?

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 |

For R&D of Automotive Solutions and Wireless Connectivity

Signalling Tester / Base Station Simulator

MD8475A

eCall ERA-GLONASS **Telematics** **All RAT for Cellular**

Ans.A

POINT 1

Scenario-less UE Function Tests using SmartStudio

Smart Studio

POINT 2

Automated Confirmation of Existing Mobile Functions using SmartStudio Manager

POINT 3

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

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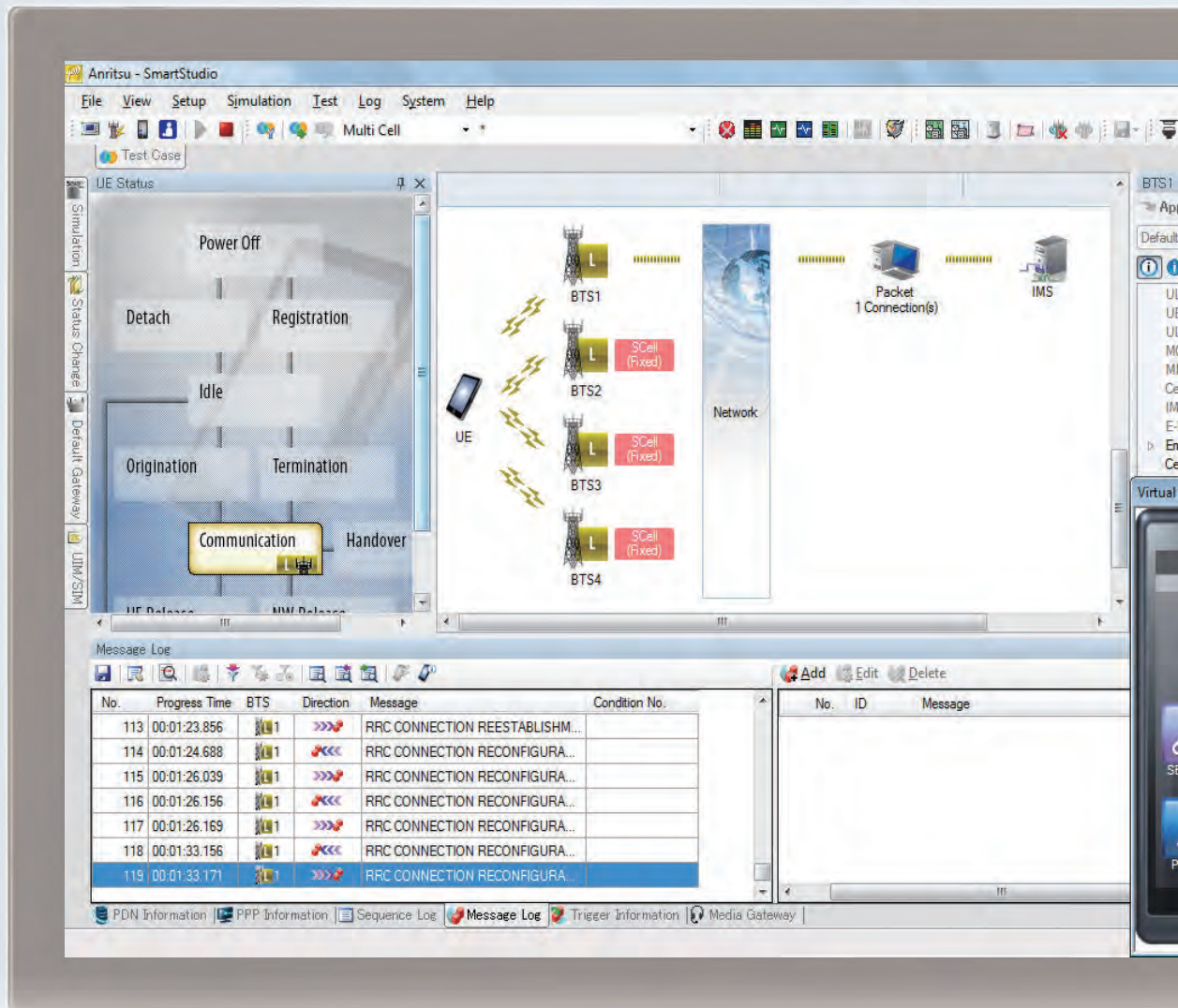
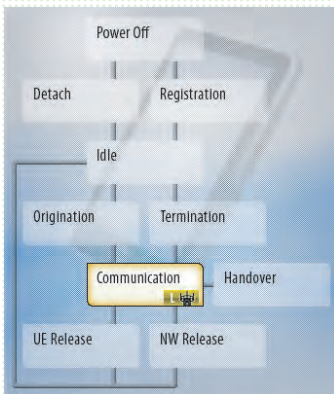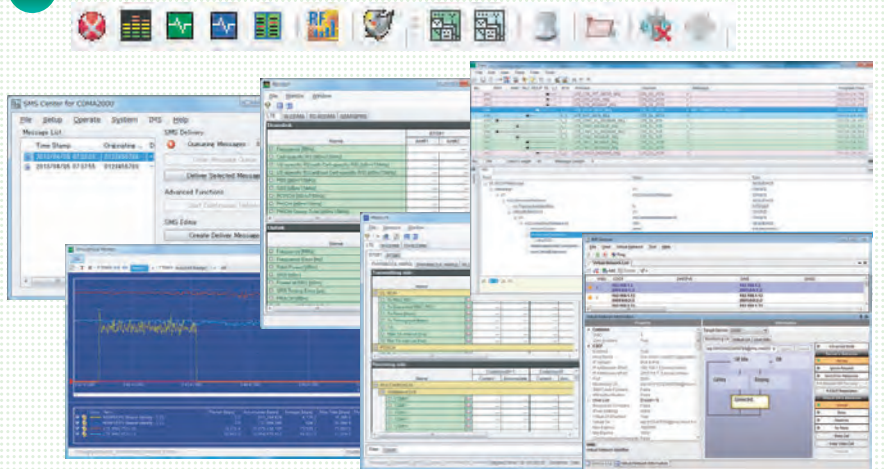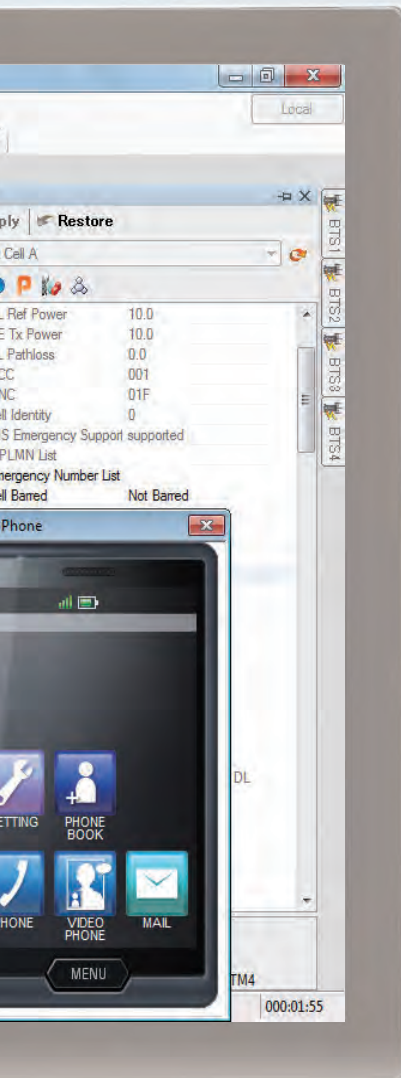**1** The connection status of UE and SmartStudio are easy to understand at a glance from the block diagram.

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.

LTE Cell
W-CDMA Cell

Multi-cell Testing

Verifies correct mobile handover by changing settings between neighboring base stations.

Emergency

Simulates emergency notifications, such as earthquake early warning, which are hard to test on live networks.

Voice / VoLTE

Tests both basic voice call and Voice over LTE (VoLTE).

Celler
SIP/IMS
WiFi

Battery Management

Simulates various environments for measuring battery life.

Packet Communication

Evaluates throughput by changing base station settings and equips built-in SIP server.

WLAN Offload

Simulates a policy delivery server and dedicated gateway for distributing traffic over a WLAN.

---

3 Double-clicking the base station band displays the base station status. Changes to base station parameters during testing are reflected immediately on-screen.
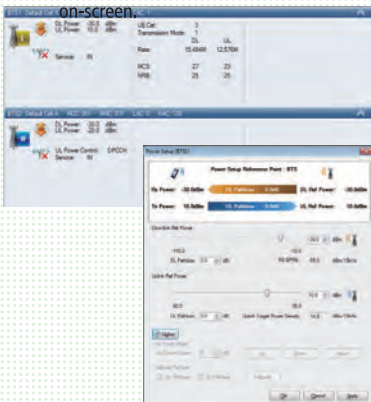
4 Details of the Smartphone and SmartStudio status can be verified easily. Changes to reject parameters during testing are reflected immediately on-screen.
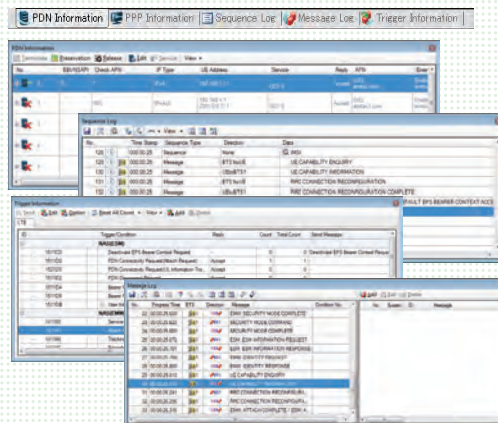
5 Both base station parameters and packet communications can be controlled. Changes to status change parameters during testing are reflected immediately on-screen.
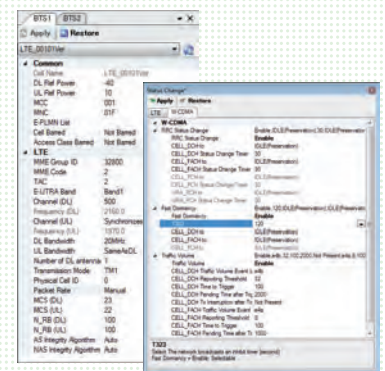
POINT 2
Automated Confirmation of Existing Mobile Functions using SmartStudio
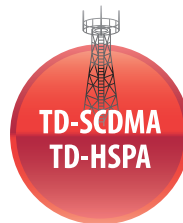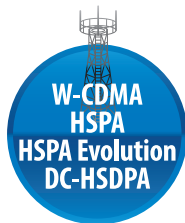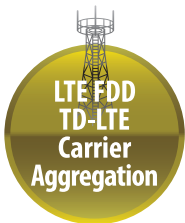
SmartStudio Manager helps improve development efficiency by automating checks of existing functions at UE development, such as Voice, SMS send/receive, and other tests.
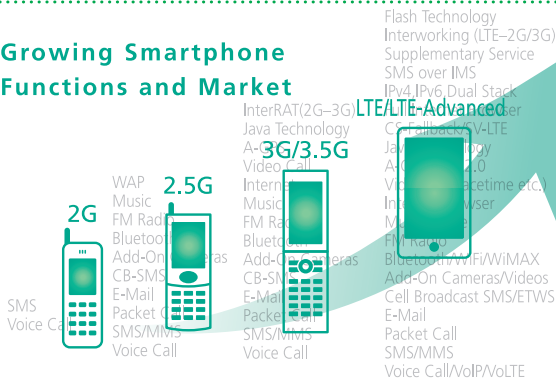
POINT 3
All-in-One Support for LTE and Other Communications Systems

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 hybrids, can be tested using the all-in-one MD8475A/MD8475B. (Requires installation of optional units and software for each systems).

| LTE FDD TD-LTE Carrier Aggregation | W-CDMA HSPA HSPA Evolution DC-HSDPA | GSM GPRS EGPRS | TD-SCDMA TD-HSPA |

TOPICS

Growing Smartphone Functions and Market

2G
- SMS
- Voice Call

2.5G
- WAP
- Music
- FM Radio
- Bluetooth
- Add-On Cameras
- CB-SMS
- E-Mail
- Packet Call
- SMS/MMS
- Voice Call

3G/3.5G
- InterRAT(2G–3G)
- Java Technology
- A-GPS
- Video Call
- Internet
- Music
- FM Radio
- Bluetooth
- Add-On Cameras
- CB-SMS
- E-Mail
- Packet Call
- SMS/MMS
- Voice Call

LTE/LTE-Advanced
- Flash Technology
- Interworking (LTE–2G/3G)
- Supplementary Service
- SMS over IMS
- IPv4,IPv6 Dual Stack
- Internet Browser
- CS Fallback/SV-LTE
- Java Technology
- A-GPS 2.0
- VoLTE (Facetime etc.)
- Internet Browser
- Music
- FM Radio
- Bluetooth/WiFi/WiMAX
- Add-On Cameras/Videos
- Cell Broadcast SMS/ETWS
- E-Mail
- Packet Call
- SMS/MMS
- Voice Call/VoIP/VoLTE

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.

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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.
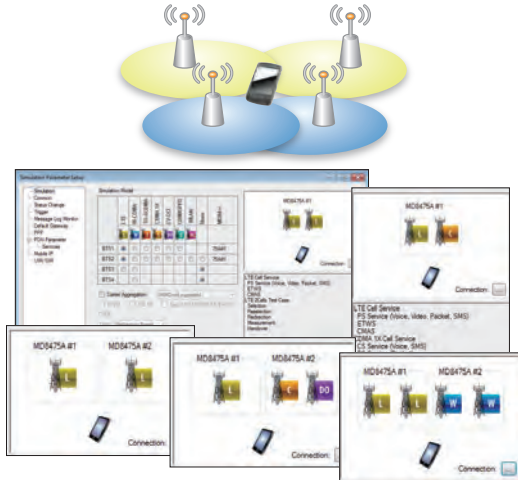
Multi-cell Test Configurations

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	TD-SCDMA/TD-HSPA	WLAN
LTE FDD/TDD	✓*1,*2	✓	✓	✓	✓*3
W-CDMA/HSPA/HSPA Evolution/DC-HSDPA	✓	✓	✓	—	✓*3
GSM/GPRS/EGPRS	✓	✓	✓	✓	✓*3
TD-SCDMA/TD-HSPA	✓	—	✓	✓	✓*3
WLAN	✓*3	✓*3	✓*3	✓*3	✓*3

*1: Two MD8475A units are required for MIMO connection.
*2: LTE-FDD/TDD Joint CA test is not supported.
*3: The WLAN Offload test requires a separate WLAN access point.

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	TD-SCDMA/TD-HSPA*2	WLAN
LTE FDD/TDD	✓	✓	✓	✓	✓*
W-CDMA/HSPA/HSPA Evolution/DC-HSDPA	✓	✓	✓	—	✓*
GSM/GPRS/EGPRS	✓	✓	✓	✓	✓*
TD-SCDMA/TD-HSPA*	✓	—	✓	✓	✓*
WLAN	✓*	✓*	✓*	✓*	—

*: The WLAN Offload test requires a separate WLAN access point.

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	LTE	LTE	LTE

Signalling Tester MD8475A/MD8475B Applications

Configuring Multi-cell Test Environment

Carrier Aggregation Tests

The MD8475A/MD8475B supports LTE CA 2CC/3CC/4CC/5CC 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 MX847550B-041 (3CC) MX847550B-042 (4CC) MX847550B-043 (5CC) 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) 2CC MIMO (4×4) 3CC SISO 3CC MIMO (2×2) 3CC MIMO (4×4) 4CC SISO 4CC MIMO (2×2) 4CC MIMO (4×4) 5CC MIMO (4×4)
UE Category	Cat.4, Cat.6	Cat.4, Cat.6, Cat.9, Cat.11, Cat.16, Cat.18, Cat.19

*: Two MD8475A units are required.

SIM Connectivity Test

Dual SIM Dual Standby (DSDS) and Dual SIM Dual Active (DSDA) tests of dual-SIM UE can be performed using two sets of MD8475A/MD8475B. 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.

Simple Throughput Test Environment (MD8475B)

Throughput testing until now

- It needs to be adjusted for each application about radio layer settings and server settings.
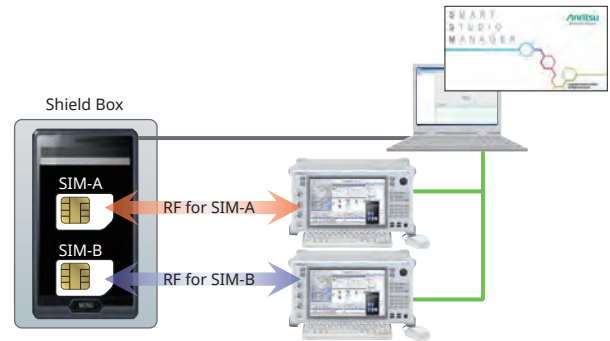- Performance depends on the PC specification and the load of Ethernet.

Throughput testing using MD8475B

- Single GUI supports to adjust for each application about radio layer settings and server settings.
- Performance is independent from PC specification and the load of Ethernet.

For the transmission and reception of the UE, use iPerf application which is widely used for throughput testing.

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.

Throughput Monitor
Checks data communications each layer for each BTS
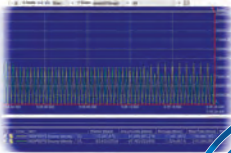
Counter
Displays detailed information, including ACK/NACK and MCS

Real Time Monitoring
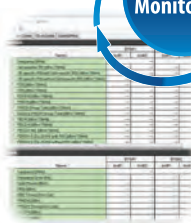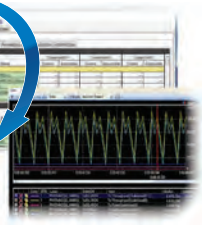
RF Monitor
Displays TRx power for frequency and channels

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.

Web Application

RF   Ethernet
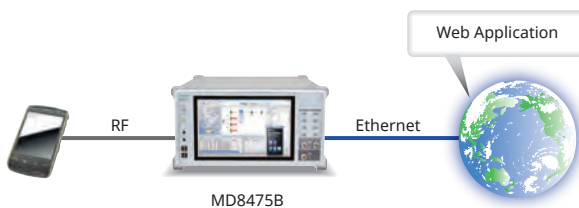
MD8475B

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.

Loopback (MD8475A/MD8475B)

RF

MD8475B

Voice call (Handset*, MD8475A)

RF

Handset Interface

MD8475A

Handset
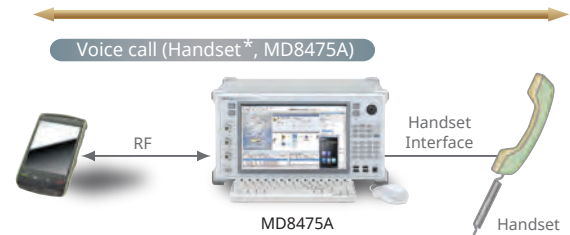
*: Not supported for LTE.

Multimedia Interface Software MX847508B

Voice call (Headset, MD8475B)

RF

MD8475B

Headset
(generic products)
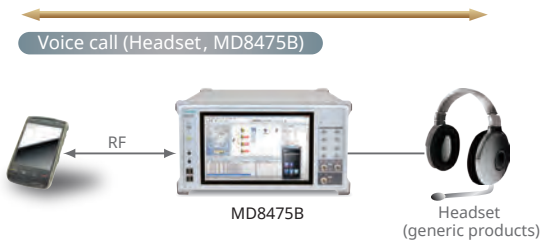
Setting Roaming and Registering Address Book

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.
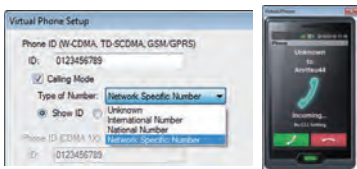
Setting Identify Type

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 (IMSI or TMSI)

MD8475B

Signalling Tester MD8475A/MD8475B Applications

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. Additionally, loopback audio data can be changed using the RTP function.

At VoLTE loopback testing, as well as looping voice data sent to the terminal from the network back from the terminal, the voice data can be changed to the MUTE status or to a fixed pattern to perform communications quality tests and battery consumption measurements requiring good reproducibility.[2]

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.
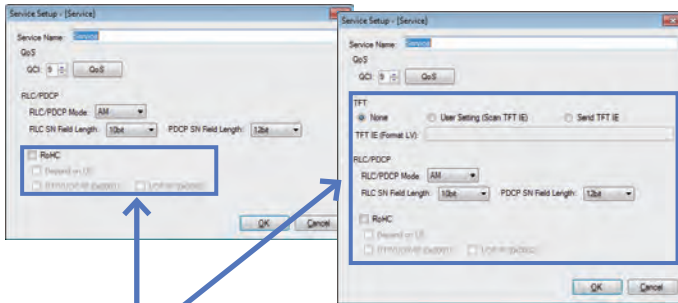
Sets RoHC[3] and TFT filter at Default Bearer and Dedicated Bearer

*1: GSM and TD-SCDMA are not supported.
*2: Requires MX847570A-086 or MX847570B-086.
*3: 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

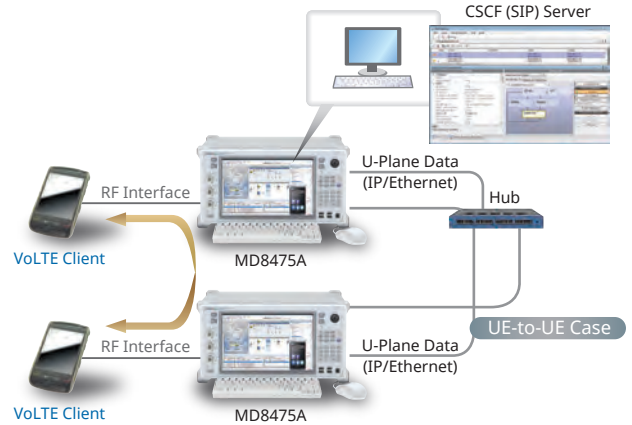A variety of technologies are used when a UE moves between systems from an LTE to 3G/2G cell. Configuring a 2-cell test environment using SmartStudio supports LTE and 2G/3G system voice call tests such as CS Fallback and SV-LTE (Simultaneous Voice and LTE).

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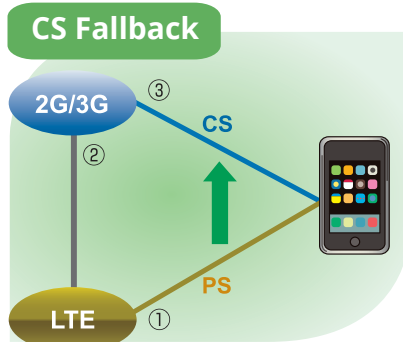
① LTE: Communications by PS
② Receive call by CS and notify UE of incoming call via LTE from 2G/3G system
③ Connect voice call by CS

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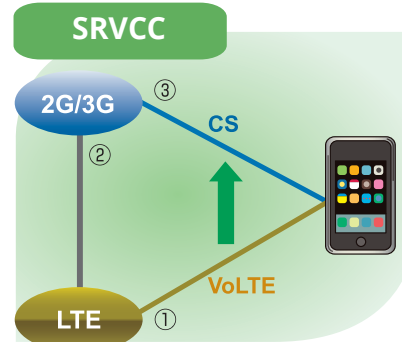
① LTE: Calling over VoLTE
② Transfer 3G/2G information from base station before moving between systems
③ Continue voice call without interruption

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.
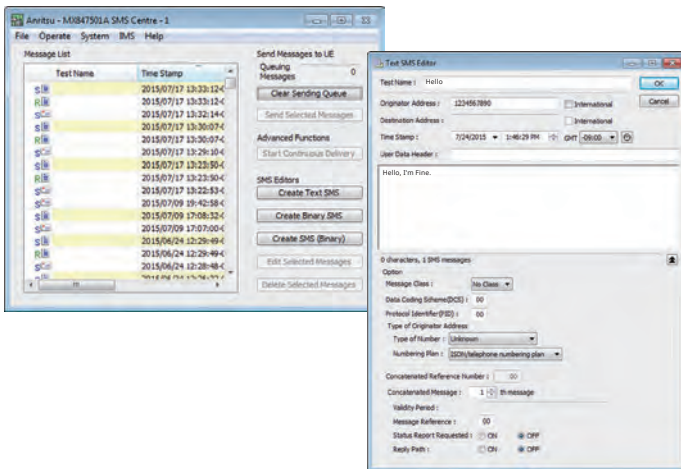
Sending Binary SMS

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.

Lock

Binary
SMS
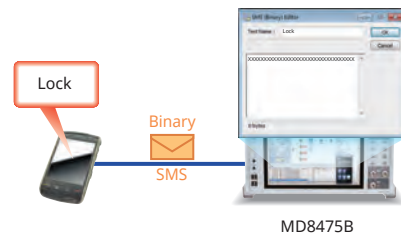
MD8475B

Signalling Tester MD8475A/MD8475B Applications

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
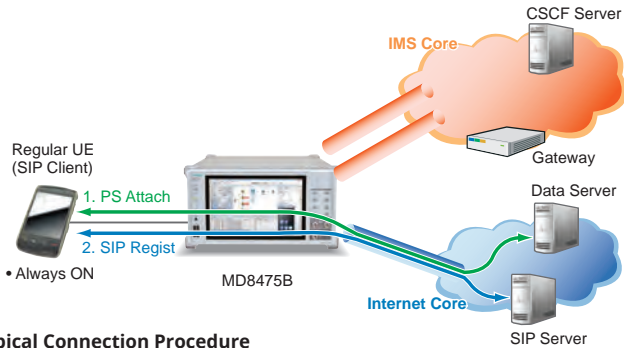
Typical Connection Procedure
1. PS Attach: Connect to Data server.
   → Get address using DNS, etc.
2. SIP Regist:
   → Depends on application.
⇒ One PDN is required.

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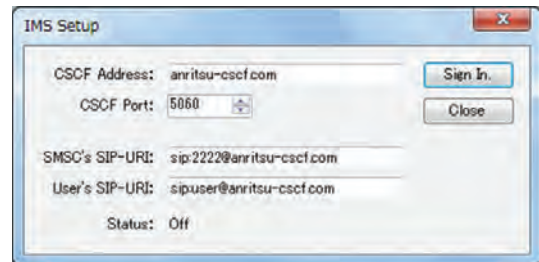
Ping Sending Function
The Ping sending function is used to verify the connection of the device under test to the network.
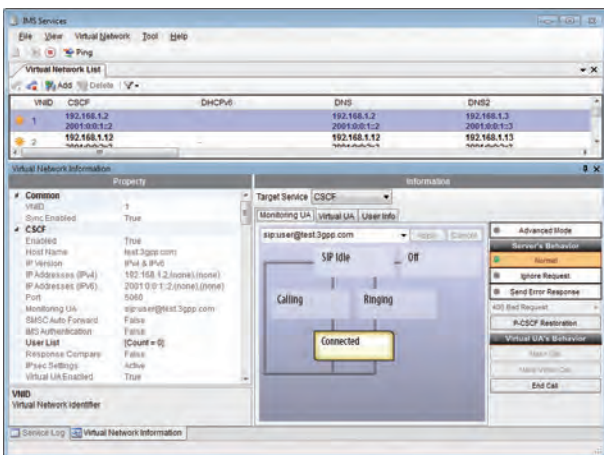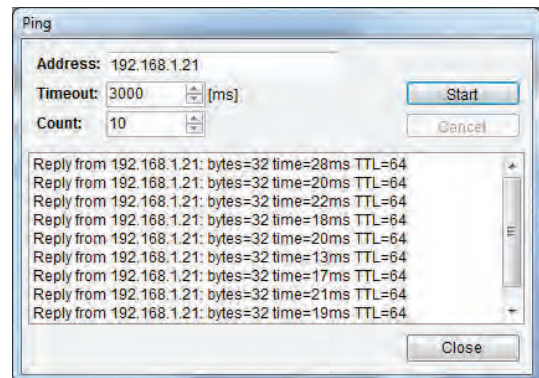
IMS Options

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)

Signalling Tester MD8475A/MD8475B Applications

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
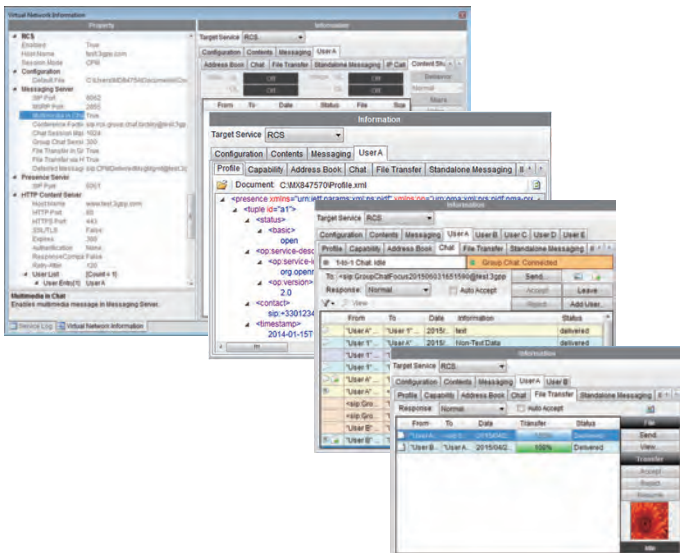
GBA Authentication Option MX847570A-084/MX847570B-084

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.

HSS: Home Subscriber Server
BSF: Bootstrapping Server Function
NAF: Network Application Function
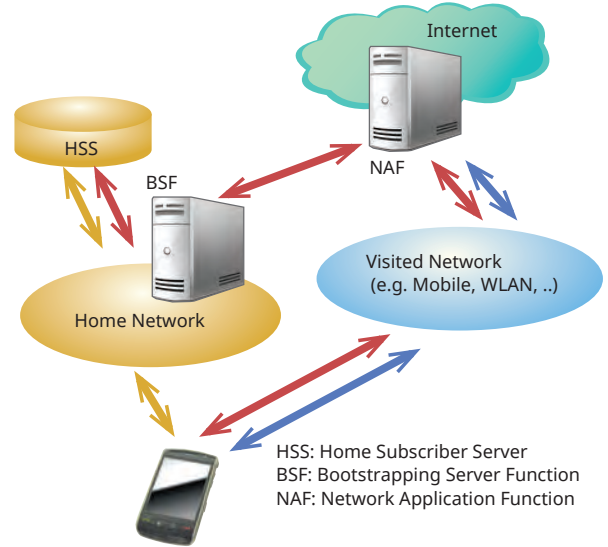
IMS Early Media Option MX847570A-085/MX847570B-085

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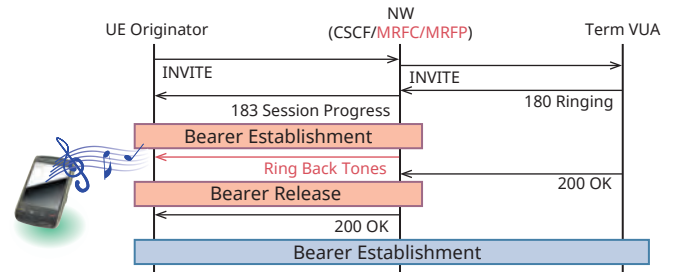
Alert-Info: Provides substitute ring back tone using Alert-Info, one of the Early Media switching function

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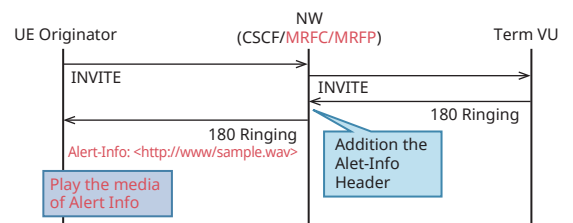
Signalling Tester MD8475A/MD8475B Applications

IMS Options

RTP Frame Control Option MX847570A-086/MX847570B-086

This software controls the media data (RTP packets) during VoLTE communications. In addition to the MUTE condition and Fixed pattern, the data itself can be delayed; it can be used to configure the static stage required at audio evaluation and battery consumption measurement.
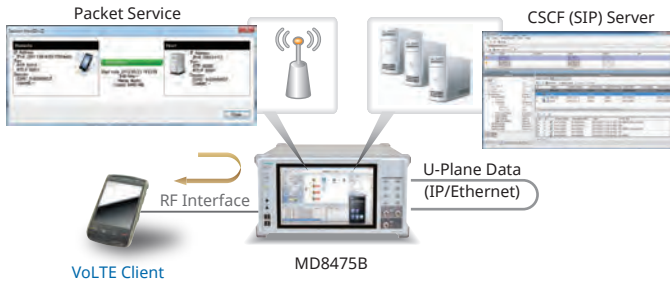
IMS Script Basic Option MX847570A-060/MX847570B-060
XCAP Script Option MX847570A-061/MX847570B-061

The software option can be used to edit and create SIP messages/XCAP messages using a ladder sequence to simulate the CSCF server/XCAP 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.
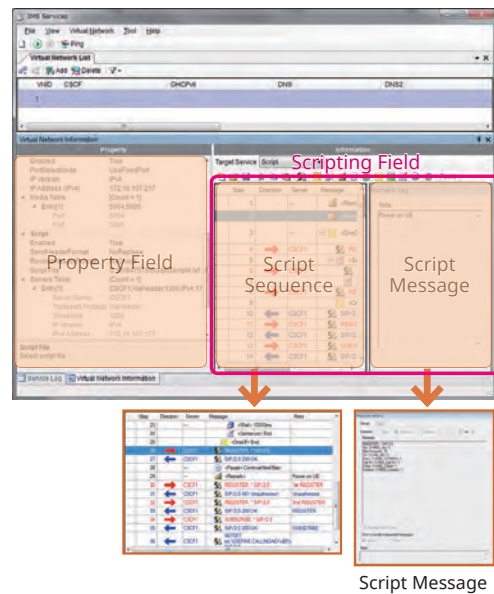
Script Message

IMS Log Import Option MX847570B-062

This software option enables importing Wireshark logs, and create IMS script automatically. This Script is editable using Add-in Sever window. This option help flexible evaluation of IMS.

IMS Options

IMS Options (MD8475A/MD8475B) ✓: Supported

Section	Function	Outline	MX847570A MX847570B	MX847570A-080 MX847570B-080	MX847570A-081 MX847570B-081	MX847570A-083 MX847570B-083	MX847570A-084 MX847570B-084	MX847570A-085 MX847570B-085	MX847570A-086 MX847570B-086	MX847570A-060 MX847570B-060	MX847570A-061 MX847570B-061
			GUI Option							Scripting Option*2	
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	✓	—	—	—	—	—	—	✓	—
	Voice Loopback Test (fixed pattern)	Function for configuring the static stage required at audio evaluation and battery consumption measurement	✓	—	—	—	—	—	✓	—	—
	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 Response 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

Signalling Tester MD8475A/MD8475B Applications

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.
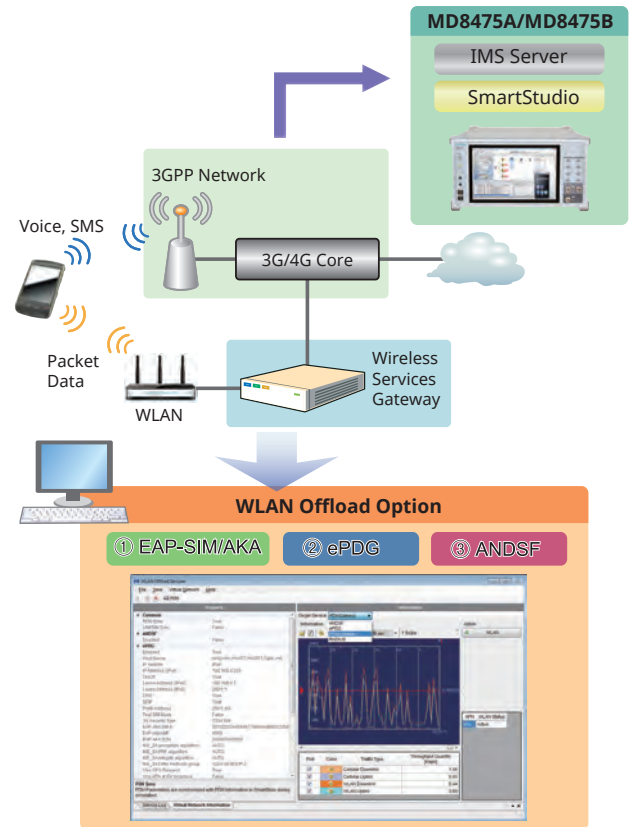
Wi-Fi Calling Evaluation Environment

Wi-Fi 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 Wi-Fi Calling voice calls as well as handover tests from VoLTE to Wi-Fi Calling and vice versa.

24
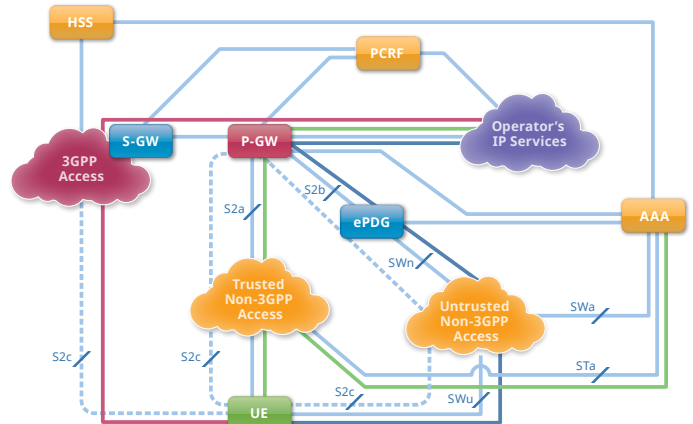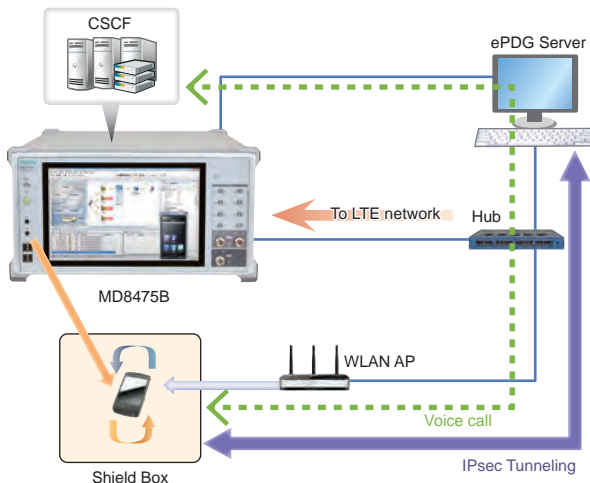
Signalling Tester MD8475A/MD8475B Applications

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.
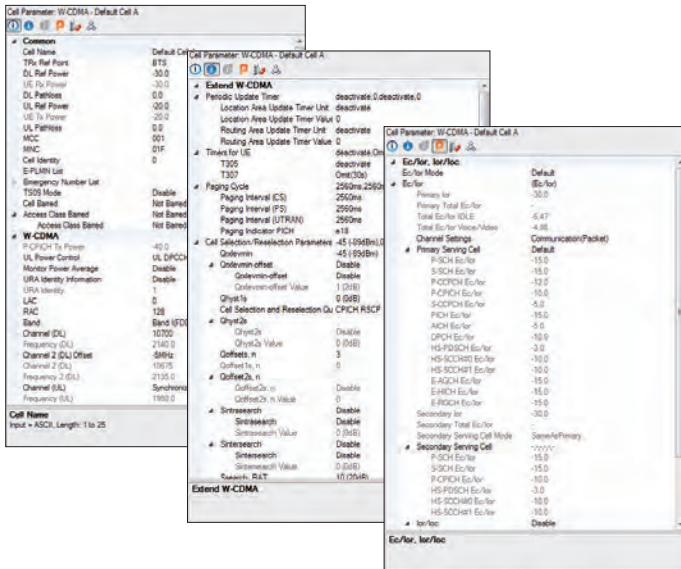
*: The settable items differ by the systems.

Packets Communication State (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.
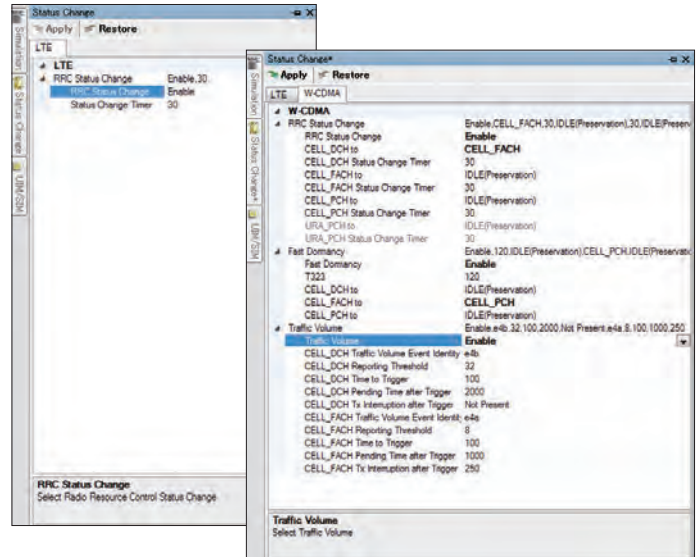
Check UE Tx RF Power

RF Measurement MX847506A
Quick TRX Diagnosis MX847506B

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.

25
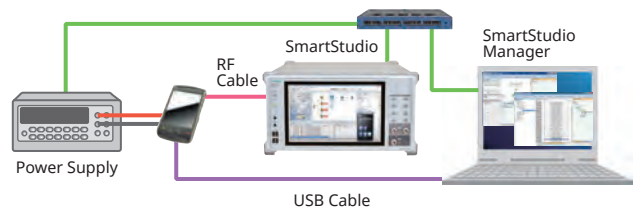
Signalling Tester MD8475A/MD8475B Applications

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.

32 cells per system (Total 160 cells)

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.

UE Capability Information
LTE
  Access Stratum Release = Rel.10
  UE Category = 4, 6
  Supported Band = 1, 3, 5, 7, 17
  Band Combinations:
    3A-5A, 5A-3A, 1A, 3A, 5A, 7A, 17A

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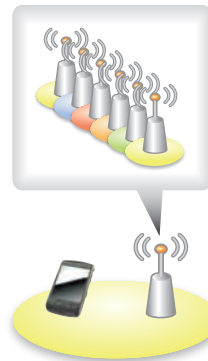
System	Information Element	Example
LTE	Access Stratum Release	Rel.12
	UE Category	4, 6, 9
	Supported Band	1, 2, 3, 4
	Band Combination	1A-2A, 3C
	Band Combination (Rel.11)	1A-2A, 3C
W-CDMA	Access Stratum Release	Rel.10
	HSDPA Category (Rel.7/Rel.8)	10 (14/24)
	HSUPA Category	6
	Supported Band	I, II
TD-SCDMA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

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

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/GSM.

Earthquake and Tsunami Warning

Signalling Tester MD8475A/MD8475B Applications

Configuring eCall Compliance to Application Test Environments

This solution makes it easy to configure an environment for emulating the eCall emergency rescue information system for automatically transmitting traffic accident information, including accident location, as well as for making voice calls to an emergency assistance Public Safety Answering Point (PSAP). Since emergency calls cannot be tested on live communications networks, combining the Signalling Tester MD8475A/B and eCall Tester MX703330E software is the perfect answer to testing IVS (In Vehicle System) communications functions.

eCall Tester MX703330E

The MX703330E emulates the eCall system IVS and PSAP communications sequence. It supports quasi-normal test of MSD timeout that are hard to simulate on a live network, as well as comparison of reference MSD (expected) and received data.
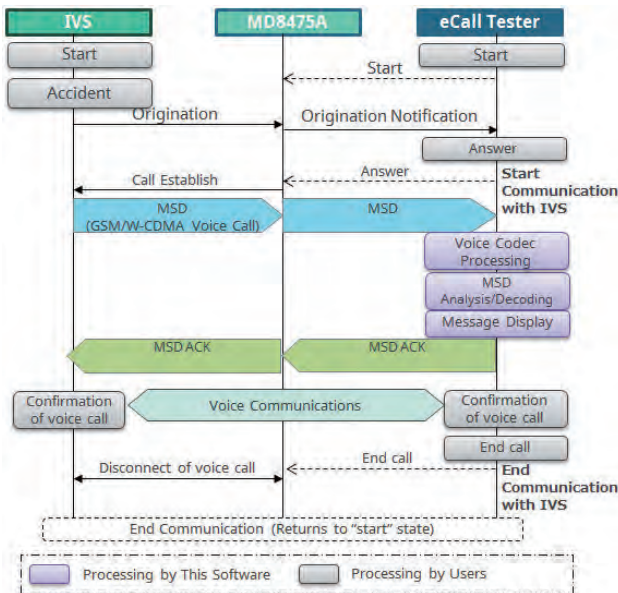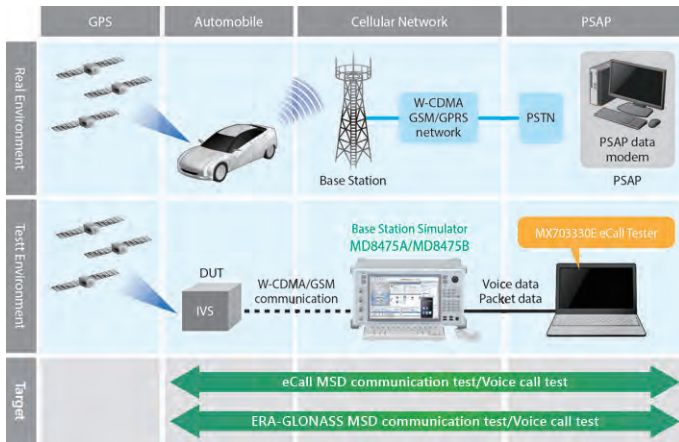
Features

- EN16454-compliant
- Implements communications sequence tests between IVS and PSAP
- Trace-displays status of eCall communications (MSD-Voice) and MSD communications (in-band modem)
- Displays in-band modem sequence and MSD decode data (conversion to meaningful data) execution results and outputs as data file
- Sets reference MSD (expected values) and displays results of comparison with received MSD
- Simulates base station operation in eCall Tester background, making specialist mobile protocol knowledge unnecessary for eCall evaluation
- Performs external control of eCall tester using SmartStudio Manager automation tool to perform PSAP operations

EU eCall Compliance Test

European Commission regulation (EU) 2017/79 approved sale of new M1 and N1 category in-vehicle eCall equipment from 31 March 2018. eCall is an emergency rescue information system for automatically transmitting traffic accident information, including accident location, as well as for making voice calls to an emergency assistance centre, or Public Safety Answering Point (PSAP).
The eCall Tester with EN 16454 PSAP server function supports configuration of the type-certification test environment. Additionally, the interactive GUI simplifies parameter changes, while display of real-time MSD analysis data improves the efficiency of pre-compliance testing, including debugging.

∗ M1 Category: Passenger vehicles with driver and 8 or less seats
  N1 Category: Trucks up to 3.5 tonnes max. load weight

Set DL-Reference Power

PSAP Status
Off Hook: Makes call with IVS unit via SmartStudio
On HooK: Terminates call with IVS unit via SmartStudio

ERA-GLONASS Option
SMS function tab

MSD Condition and Settings
MSD Pull: Transmission to signal PSAP modem (pull mode)
Manual Reset: Force idle
Enable Timeout Test: Timeout setting

Audio Level Meter: Input/Output

Received MSD Lists

MSD Result (sequence and decode)
Save: MSD result save at XML file

eCall Application Testing

Some IVS have requirements for both calling and Telematics functions while driving. Figure shows the handover between base stations during driving.

Figure shows the situation when the IVS switches from a 4G network connection used by Telematics services during driving to a 2G/3G network connection for eCall functions when an accident occurs. To emulate this type of test environment, the MD8475A and eCall Tester software perform the handover and CS Fallback switching tests in combination with the eCall function test.
Requires Multi-Cell Option MX703330E-061.
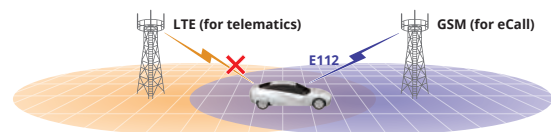
One-touch handover test settings save time and eliminate user worries. The following cells are supported.

	LTE	W-CDMA	GSM
LTE*	—	✓	✓
W-CDMA	✓	✓	✓
GSM	✓	✓	✓

∗: VoLTE not supported

These tests help to greatly improve IVS quality and reliability.

Signalling Tester MD8475A Applications

eSIM OTA Verification Solution eUICC Profile Manager Z2002A

MD8475A with COMPRION's software eUICC Profile Manager can performing eSIM (Embedded SIM) test.

eSIM allows the communication protocol information on a SIM to be changed via an OTA (Over the Air) environment.
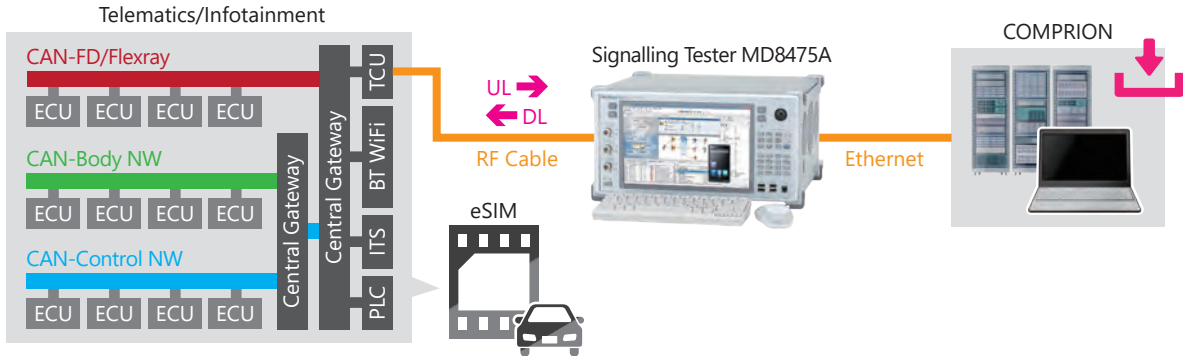
Sequence Flow
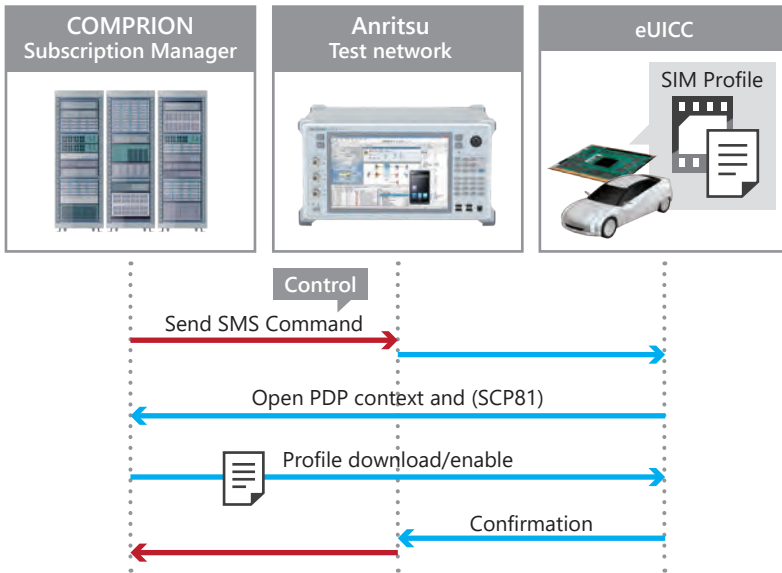
Z2002A include following Software and USB dongle 1pc made by COMPRION.

Model No.	Model name	Quantity
31000111	eUICC Profile Manager	1
31000204 31000134 31000057 31000205	Network Simulation Control Connection Package Anritsu MD8475A Network Simulation Control Connection SMSC Simulation Anritsu MD8475A Signaling Control	1
31000113	Profile Explorer	1
31000114	Profile Loader M2M	1
#3100 0171	Dongle	1

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.
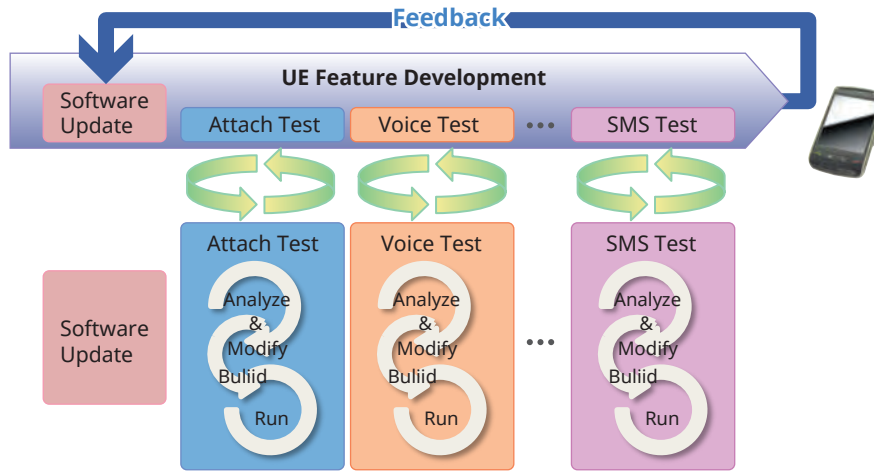
Automated Testing with SmartStudio: SmartStudio Manager MX847503A

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

1. Configure RAT & Network (SimParameters)
2. Configure BTS (Cell Parameters)
3. Start Simulation
4. Wait UE response

Test Sequence Continuous Execution Screen

Test Sequence Continuous Execution Results Display

Signalling Tester MD8475A/MD8475B Automation Functions

Regression Tests Necessity

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.

Current UE Type — Play & Record — Actual Display on UE and Virtual Control (taps and swipes)

Scriptlet List — Record Actions on physical UE Screen — UE Control Method

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	
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

Smart Studio

✓: Supported

Function	Description	MD8475A			
		LTE	W-CDMA	GSM	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, 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, 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		✓	✓	✓
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		✓	✓	✓
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	✓*4			
DL3CC Carrier Aggregation	Performs DL3CC carrier application tests				
UL2CC Carrier Aggregation	Performs UL2CC carrier application tests	✓*6			
FDD/TDD Joint Operation	Performs FDD and TDD Joint Operation test	✓*5			
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				✓	
TD-SCDMA					
TD-SCDMA/HSPA*7 Packet Calling/Answering	Connects server and performs application test using packet data communications				✓
TD-SCDMA/HSPA*7 Packet UE Side Disconnect					✓
TD-SCDMA/HSPA*7 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*8	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: Requires two MD8475A sets for 2CC MIMO tests

*5: LTE-FDD/TDD Joint CA test is not supported.
*6: Throughput limited up to 50 Mbps
*7: DCH Measurement Occasion/Idle Interval Measurement Function are not supported
*8: Requires separate MMS server

Signalling Tester MD8475A

Signalling Tester MD8475A Panel Layout
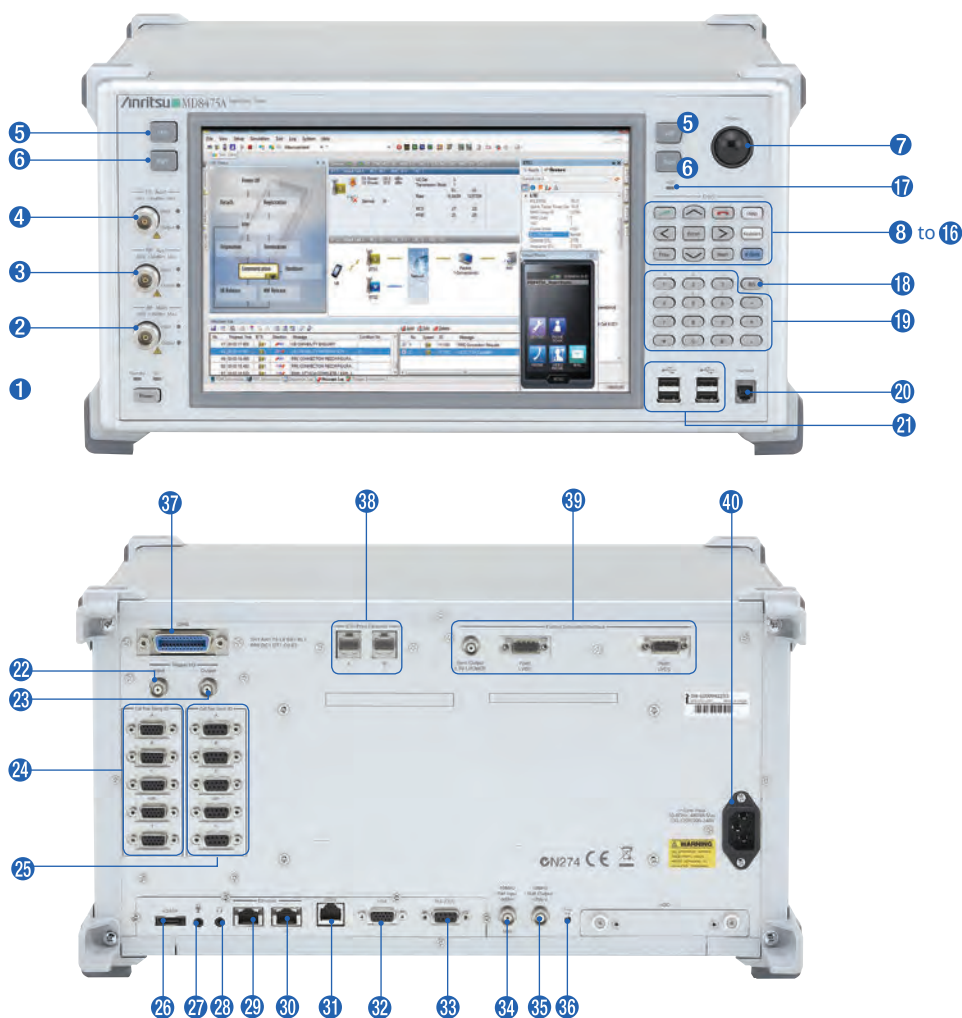
① **Power switch**
② **[RF Main] N-type Main I/O connector (N)**
③ **[RF Aux1] N-type auxiliary I/O connector 1 (N)**
④ **[RF Aux2] N-type auxiliary I/O connector 2 (N)**
⑤ ⬚ **Left keys**
⑥ ⬚ **Right keys**
⑦ **[Pointer] Pointer**
⑧ ⬚⬚⬚⬚ **Cursor keys**
⑨ ⬚ **Enter key**
⑩ ⬚ **Off-hook key**
⑪ ⬚ **On-hook key**
⑫ ⬚ **Prev key**
⑬ ⬚ **Next key**
⑭ ⬚ **Help key**
⑮ ⬚ **Keyboard key**
⑯ ⬚ **Shift key**
⑰ **[HDD] Hard disk access lamp**
⑱ ⬚ **Backspace key**
⑲ ⬚ **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

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.

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.

Multimedia Interface Software MX847508A

This software is required for end-to-end voice tests between microphones and speakers (headsets) connected to the MD8475A and the mobile equipment. The W-CDMA and GSM AMR-NB (AMR Narrowband), GSM EFR (Enhanced Full Rate Speech), FR (Full Rate Speech), and HR (Half Rate Speech) codec can be used.

AMR-WB MX847508A-001

This option supports the W-CDMA AMR-WB (AMR Wideband) codecs. The MX847508A is required.

Supported voice codec list

Supported Codecs	Multimedia Interface Software MX847508A	AMR-WB MX847508A-001
AMR-NB (W-CDMA/GSM)	✓	—
GSM-EFR (GSM)	✓	—
GSM-FR (GSM)	✓	—
GSM-HR (GSM)	✓	—
AMR-WB (W-CDMA)	—	✓

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.

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.

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.

• **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

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 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.

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

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.

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

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).

RTP Frame Control Option MX847570A-086

This option is for controlling media data (RTP packets) during VoLTE communications. It can be used to configure a voice environment in the MUTE status and with fixed data; a measurement environment can be configured for abnormal audio quality verification and battery power consumption tests in a fixed state.

● 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.

Signalling Tester MD8475A

Signalling Tester MD8475A System Configurations/Option/Software

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: 2015
- EN16062: 2015
- EN16454: 2015
- ISO3779: 2009

This option can be used as a test environment for model authentication in accordance with the EN16454 recommendations. This option provides audio replay and record functions.

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

EGTS Server ERA GLONASS Option MX703330E-032

This option provides a test environment to send/receive and encode/decode EGTS messages defined in the GOST R 54619/54620. MX703330E-031 is separately required.

NG112 LTE eCall Option MX703330E-041

This option provides functional tests for MSD data communication and voice call over IMS defined in the RFC8147 standard.

Multi-Cell Option MX703330E-061

This option provides the handover test environment required when setting two or more cells as well as the CS Fallback test environment at the eCall environment. Practical eCall module tests are supported using this option.
The cell combinations are as follows:

	LTE	W-CDMA	GSM
LTE*	—	✓	✓
W-CDMA	✓	✓	✓
GSM	✓	✓	✓

*: VoLTE is not supported

● Support Service

MX703330E 1-Year Support Service MX703330E-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.

SSM Test PKG European eCall MX847503A-601

This test package provides automated test environment. Opening the test case on the SSM, it shows test procedures of test items defined in the (EC) 2017/79 and EN16454, and automatically configures the setting of MD8475A/MD8475B and eCall tester. This test package also has report functions for each standards.

SSM Test PKG GOST 33467 MX847503A-701

This test package provides automated test environment. Opening the test case on the SSM, it shows test procedures of test items defined in the GOST33457, and automatically configures the setting of MD8475A/MD8475B and eCall tester. This test package also has report functions for each standards.

Scenario Tools

SIDE Software MX847580A
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.

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

Signalling Tester MD8475A SmartStudio System Configuration

System	LTE		W-CDMA	TD-SCDMA	GSM
	FDD	TDD			
Unit	Signalling Tester MD8475A				
Unit Option	2nd RF MD8475A-001				
	Fading IO Option MD8475A-003				
Platform Software	Multi-cell Software MX847502A				
	—		Multimedia Interface Software MX847508B		
	—		AMR-WB MX847508B-001	—	—
Basic Configuration — Hardware	Multi Signalling Unit MD8475A-070			TD-SCDMA/HSPA Signalling Unit MD8475A-040	GSM Signalling Unit MD8475A-020
Basic Configuration — Software	LTE Simulation Software MX847550A		W-CDMA Simulation Software MX847510A	TD-SCDMA Simulation Software MX847540A	GSM/GPRS Simulation Software MX847520A
	LTE FDD Option MX847550A-010	LTE TDD Option MX847550A-015			
Options	LTE 2×2 MIMO Option MX847550A-020		HSPA Option MX847510A-001	TD-HSPA Option MX847540A-001	EGPRS Option MX847520A-001
	LTE Carrier Aggregation Option MX847550A-040		HSPA Evolution/ DC-HSDPA Option MX847510A-011		
	LTE RoHC Option MX847550A-060				
	LTE Ciphering Option MX847550A-050		W-CDMA Ciphering Option MX847510A-050	TD-SCDMA Ciphering Option MX847540A-050	GSM/GPRS Ciphering Option MX847520A-050
Support Service	MX847550A 1Year Support Service MX847550A-SS110		MX847510A 1Year Support Service MX847510A-SS110	MX847540A 1Year Support Service MX847540A-SS110	MX847520A 1Year Support Service MX847520A-SS110
User Interface	SmartStudio MX847570A				
SmartStudio License — System Option	LTE FDD Option MX847570A-050	LTE TDD Option MX847570A-055	W-CDMA Option MX847570A-010	TD-SCDMA Option MX847570A-040	GSM Option MX847570A-020
			HSPA Evolution/ DC-HSDPA Option MX847570A-011		
SmartStudio License — IMS	Extended CSCF Option MX847570A-080				
	IMS Supplementary Service Option MX847570A-081				
	RCS Basic Option MX847570A-083				
	GBA Authentication Option MX847570A-084				
	IMS Early Media Option MX847570A-085				
	RTP Frame Control Option MX847570A-086				
SmartStudio License — WLAN	WLAN Offload Basic Option MX847570A-070				
	ePDG Option MX847570A-071				
	ANDSF Option MX847570A-072				
	Extended ePDG Option MX847570A-073				
SmartStudio License — Scripting Option	IMS Script Basic Option MX847570A-060				
	XCAP Script Option MX847570A-061				
SmartStudio License — Technical Support Service	MX847570A-060 1 Year Technical Support Service MX847570A-TS160				
	MX847570A-061 1 Year Technical Support Service MX847570A-TS161				
RF Measurement	RF Measurement MX847506A			—	RF Measurement MX847506A
Remote Interface	SmartStudio Manager MX847503A				
	eCall Tester Control Library MX847503A-923				
	Smartphone Control Platform MX847504A				
eCall Option	eCall Tester (Perpetual License) MX703330E-PL010		eCall Tester (Perpetual License) MX703330E-PL010	—	eCall Tester (Perpetual License) MX703330E-PL010
	—		MSD ERA GLONASS Option MX703330E-031	—	MSD ERA GLONASS Option MX703330E-031
	—		EGTS Server ERA GLONASS Option MX703330E-032	—	EGTS Server ERA GLONASS Option MX703330E-032
	NG112 LTE eCall Option MX703330E-041		Multi-Cell Option MX703330E-061	—	Multi-Cell Option MX703330E-061
	MX703330E 1-Year Support Service MX703330E-SS110		MX703330E 1-Year Support Service MX703330E-SS110	—	MX703330E 1-Year Support Service MX703330E-SS110

Signalling Tester MD8475A

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)

CE	EMC	2014/30/EU, EN61326-1, EN61000-3-2
	LVD	2014/35/EU, EN61010-1
	RoHS	2011/65/EU, EN50581

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 options
MD8475A-001	2nd RF
MD8475A-003	Fading IO Option
	Software options
MX847502A	Multi-cell Software
MX847506A	RF Measurement
MX847508A	Multimedia Interface Software
MX847508A-001	AMR-WB
	User interface
MX847570A	SmartStudio
MX847570A-010	W-CDMA Option
MX847570A-011	HSPA Evolution/DC-HSDPA Option
MX847570A-020	GSM 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
MX847570A-086	RTP Frame Control 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-060	LTE RoHC 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
	GSM system
MD8475A-020	GSM Signalling Unit
MX847520A	GSM/GPRS Simulation Software
MX847520A-001	EGPRS Option
	TD-SCDMA system
MD8475A-040	TD-SCDMA Signalling Unit
MX847540A	TD-SCDMA Simulation Software
MX847540A-001	TD-HSPA Option

Model/Order No.	Name
	Automation tools
MX847503A	SmartStudio Manager
MX847503A-601	SSM Test PKG European eCall
MX847503A-701	SSM Test PKG GOST 33467
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
	Automotive applications
MX703330E-PL010	eCall Tester (Perpetual License)
MX703330E-031	MSD ERA GLONASS Option
MX703330E-032	EGTS Server ERA GLONASS Option
MX703330E-041	NG112 LTE eCall Option
MX703330E-061	Multi-Cell 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
MX847540A-SS110	MX847540A 1Year Support Service
MX847550A-SS110	MX847550A 1Year Support Service
MX702600B-SS110	MX702600B 1Year Support Service
MX703330E-SS110	MX703330E 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 Ordering Information

Signalling Tester MD8475A

Model/Order No.	Name
	Application parts
41KC-3	Fixed Attenuator 3 dB
B0655A	Rack Mount Kit
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)
J1287	HDD-SUB15P Cable (milli-inch, for connecting MN8110B)
J1333A	HDD-SUB15P Crossover Cable (inch)
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)
J1674A	SMA/P-SMA/P Soft Rigid Cable
J1674E	SMA/P-SMA/P Soft Rigid Cable (5 pcs)
J1674K	SMA/P-SMA/P Soft Rigid Cable (10 pcs)
MN8150A	RF Combiner Unit
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)
Z1908D	Standard Laptop for SSM
Z1919B	Standard Desktop for WLAN
Z2002A	eUICC Profile Manager

Signalling Tester MD8475B

Signalling Tester MD8475B SmartStudio Test Functions

✓: Supported

Function	Description	LTE	W-CDMA*2	GSM*2	TD-SCDMA*2
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, TD-SCDMA					
CSFB/eCSFB*3	Auto-switches communication method when other system voice call received during LTE call	✓	✓	✓	✓
SRVCC*3	Performs seamless switch to CS voice call during VoLTE call	✓	✓	✓	—
W-CDMA, GSM, TD-SCDMA					
Voice Call/Answer/On-hook (Loopback/Echoback)	Performs loopback call test*4		✓	✓	✓
Voice Call/Answer/On-hook (Handset)	Performs call test using headset		✓	✓	✓
Emergency Call/Originating	Performs emergency call test with and without Test SIM		✓	✓	✓
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		✓	✓	✓
W-CDMA, TD-SCDMA					
Videophone Call/Answer/On-hook (Loopback)	Performs loopback call test*4		✓		✓
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	✓	✓	—	✓
IP Data Traffic Functions	Uses built-in packet generator to implement simple measurement system with automated high-reproducibility data throughput test	✓	✓	✓	✓
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	✓			
DL5CC Carrier Aggregation	Performs DL5CC carrier application tests	✓			
UL2CC Carrier Aggregation	Performs UL2CC carrier application tests	✓*5			
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				✓	
TD-SCDMA					
TD-SCDMA/HSPA*7 Packet Calling/Answering	Connects server and performs application test using packet data communications				✓
TD-SCDMA/HSPA*7 Packet UE Side Disconnect					✓
TD-SCDMA/HSPA*7 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*4	✓	✓	✓	✓
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*8	Performs MMS send/receive test	✓	✓	✓	✓

*1: Ciphering function not supported
*2: Support for installing the Enhanced Multi-signalling Unit (MD8475B-071) is expected in future.
*3: Only dual system configuration supported
*4: Two-way tests using two UEs not supported
*5: Limited to 50 Mbps throughput when MD8475B-070 installed
*6: Requires MD8475B-071
*7: DCH Measurement Occasion/Idle Interval Measurement function not supported
*8: Requires separate MMS server

Signalling Tester MD8475B

Signalling Tester MD8475B Panel Layout
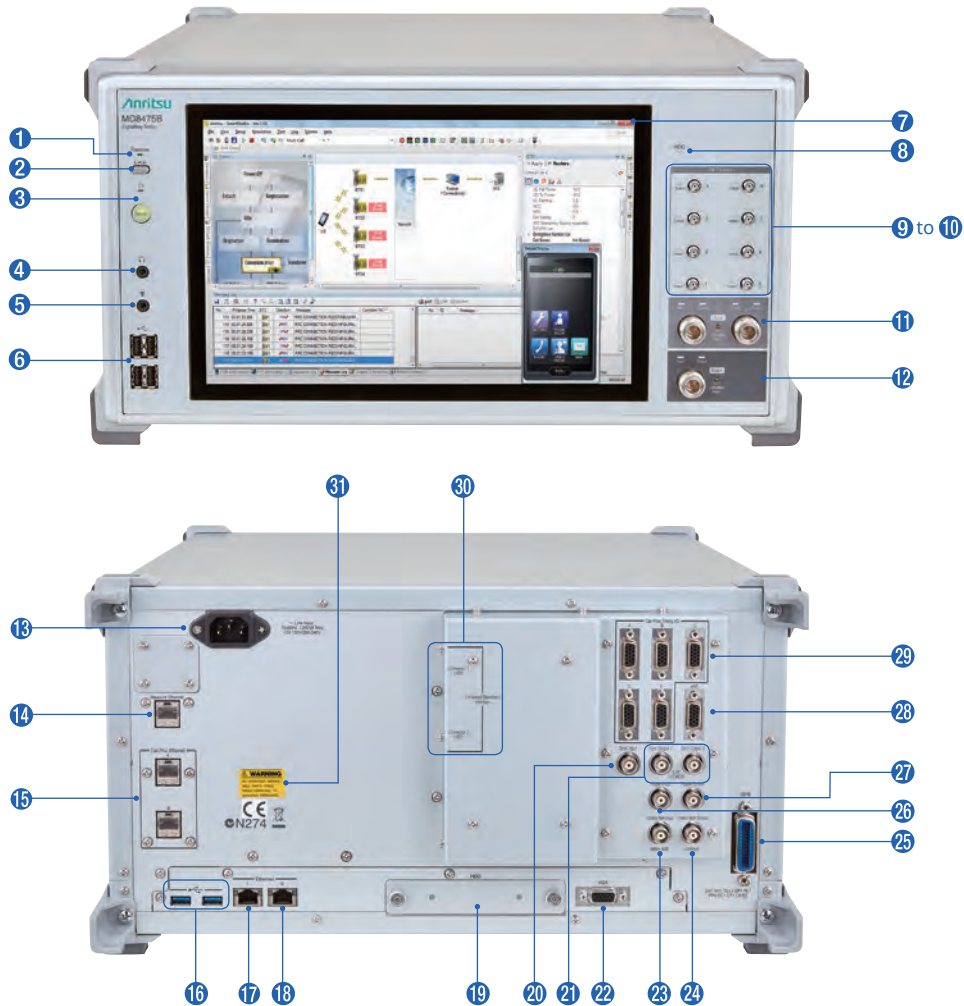
❶	Remote lamp	❿	Ethernet 1 connector
❷	Local key	⓲	Ethernet 0 connector
❸	Power switch	⓳	Hard disk
❹	Headphone jack	⓴	Sync Input connector
❺	Microphone jack	㉑	Sync Output connectors
❻	USB connectors	㉒	VGA connector
❼	Display	㉓	Reference signal input connector
❽	Hard disk access lamp	㉔	Reference signal output connector
❾	SMA-type DL Output 1/2/5/6 connector	㉕	GPIB connector
❿	SMA-type DL Output 3/4/7/8 connector	㉖	Trigger output connector
⓫	N-type Main I/O connector	㉗	Trigger input connector
⓬	N-type auxiliary I/O 1/2 connector	㉘	ARB I/O connector
⓭	Power inlet	㉙	Timing I/O connectors for call processing
⓮	Ethernet I/O connector for Measure	㉚	Enhanced Baseband Interface connectors
⓯	Call Proc Ethernet I/O connectors	㉛	Safety label
⓰	USB connectors		

Signalling Tester MD8475B

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.

IP Extension Option MD8475B-005
This option enables FTP throughput testing with multiple external servers.

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.

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)	—	✓

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
Enhanced Multi-signalling Unit MD8475B-071
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 V14.10.0 (2019-03) 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
DL Category M1	1000	1000	25344	1
DL Category M2	4008	4008	73152	1
DL Category 0	1000	1000	25344	1
DL Category 1 bis	10296	10296	250368	1
DL Category 4	150752	75376	1827072	2
DL Category 6	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
DL Category 7	301504	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	3654144	2 or 4
DL Category 9	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
DL Category 10	452256	149776 (4 layers, 64QAM) 75376 (2 layers, 64QAM)	5481216	2 or 4
DL Category 11	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4
DL Category 12	603008	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM)	7308288	2 or 4
DL Category 13	391632	195816 (4 layers, 256QAM) 97896 (2 layers, 256QAM)	3654144	2 or 4
DL Category 14	3916560	391656 (8 layers, 256QAM)	47431680	8
DL Category 15	749856-807744	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	9744384	2 or 4
DL Category 16	978960-1051360	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	12789504	2 or 4
DL Category 17	25065984	391656 (8 layers, 256QAM)	303562752	8
DL Category 18	1174752-1211616	[299856 (8 layers, 64QAM) 391656 (8 layers, 256QAM)] 149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	14616576	2 or 4 [or 8]

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
DL Category 19	1566336-1658272	[299856 (8 layers, 64QAM) 391656 (8 layers, 256QAM)] 149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	19488768	2 or 4 [or 8]
DL Category 20	1948064-2019360	[299856 (8 layers, 64QAM) 391656 (8 layers, 256QAM)] 149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	24360960	2 or 4 [or 8]
DL Category 21	1348960-1413120	149776 (4 layers, 64QAM) 195816 (4 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 201936 (4 layers, 256QAM, if alternativeTBS-Index-r14 is supported) 75376 (2 layers, 64QAM) 97896 (2 layers, 256QAM, if alternativeTBS-Index-r14 is not supported) 100752 (2 layers, 256QAM, if alternativeTBS-Index-r14 is supported)	17052672	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	Support for 256QAM in UL
UL Category M1	1000 or 2984	1000 or 2984	No	No
UL Category M2	6968	6968	No	No
UL Category 0	1000	1000	No	No
UL Category 1 bis	5160	5160	No	No
UL Category 3	51024	51024	No	No
UL Category 5	75376	75376	Yes	No
UL Category 7	102048	51024	No	No
UL Category 8	1497760	149776	Yes	No
UL Category 13	150752	75376	Yes	No
UL Category 14	9585664	149776	Yes	No
UL Category 15	226128	75376	Yes	No
UL Category 16	105528	105528	Yes	Yes
UL Category 17	2119360	211936	Yes	Yes
UL Category 18	211056	105528	Yes	Yes
UL Category 19	13563904	211936	Yes	Yes
UL Category 20	316584	105528	Yes	Yes
UL Category 21	301504	75376	Yes	No

★ These UE Category tables show the case when MD8475B-071 is installed.

Signalling Tester MD8475B

Signalling Tester MD8475B System Configurations/Option/Software

● **Options**

LTE 2×2 MIMO Option MX847550B-020

This option adds 2×2 MIMO to the MX847550B.

LTE 4×4 MIMO Option MX847550B-021

This option adds 4×4 MIMO to the MX847550B.

LTE Licensed Assisted Access (LAA) Option MX847550B-030

This software option provides LTE Licensed Assisted Access (LAA) capability that can be used with the MIMO options and the Carrier Aggregation Options.

LTE Carrier Aggregation Option MX847550B-040

This software option 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 Carrier Aggregation DL5CCs Option MX847550B-043

This software option supports LTE 5CC Carrier Aggregation. It supports the 5CC SISO test environment. Additionally, installing the MX847550B-020 software supports the 5CC 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

LTE 20 Layers Extension Option MX847550B-070

This option enables LTE 20 Layers (LTE 5CC, 4×4 MIMO) testing. If this option is not installed, LTE 16 Layers (4×4 MIMO for 3CCs and 2×2 MIMO for 2CCs out of LTE 5CCs) is maximum.

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

Signalling Tester MD8475B System Configurations/Option/Software

TD-SCDMA

● Basic Configuration

TD-SCDMA Signalling Unit MD8475B-040
TD-SCDMA Simulation Software MX847540B
TD-SCDMA Option MX847570B-040

These are for basic TD-SCDMA/TD-HSUPA*[1] configuration which support voice, videophone, packet, and SMS tests.

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: MX847570B supports Category 6 only.
*2: One timeslot supports two physical channels when 16QAM not used.

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.

IMS Log Import Option MX847570B-062

This software option enables importing Wireshark logs, and create IMS script automatically. This Script is editable using Add-in Sever window. This option help flexible evaluation of IMS.

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).

RTP Frame Control Option MX847570B-086

This option is for controlling media data (RTP packets) during VoLTE communications. It can be used to configure a voice environment in the MUTE status and with fixed data; a measurement environment can be configured for abnormal audio quality verification and battery power consumption tests in a fixed state.

● 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.

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: 2015
- EN16062: 2015
- EN16454: 2015
- ISO3779: 2009

This option can be used as a test environment for model authentication in accordance with the EN16454 recommendations. This option provides audio replay and record functions.

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

EGTS Server ERA GLONASS Option MX703330E-032

This option provides a test environment to send/receive and encode/decode EGTS messages defined in the GOST R 54619/54620. MX703330E-031 is separately required.

NG112 LTE eCall Option MX703330E-041

This option provides functional tests for MSD data communication and voice call over IMS defined in the RFC8147 standard.

Multi-Cell Option MX703330E-061

This option provides the handover test environment required when setting two or more cells as well as the CS Fallback test environment at the eCall environment. Practical eCall module tests are supported using this option.
The cell combinations are as follows:

	LTE	W-CDMA	GSM
LTE*	—	✓	✓
W-CDMA	✓	✓	✓
GSM	✓	✓	✓

∗: VoLTE is not supported

● **Support Service**

MX703330E 1-Year Support Service MX703330E-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.

SSM Test PKG European eCall MX847503A-601

This test package provides automated test environment. Opening the test case on the SSM, it shows test procedures of test items defined in the (EC) 2017/79 and EN16454, and automatically configures the setting of MD8475A/MD8475B and eCall tester. This test package also has report functions for each standards.

SSM Test PKG GOST 33467 MX847503 A-701

This test package provides automated test environment. Opening the test case on the SSM, it shows test procedures of test items defined in the GOST33467, and automatically configures the setting of MD8475A/MD8475B and eCall tester. This test package also has report functions for each standards.

Signalling Tester MD8475B

Signalling Tester MD8475B System Configurations/Option/Software

Scenario Tools

SIDE Software MX847580B
SIP Option MX847580B-018

These software are for executing scenarios created using the MX843080A Scenario Integrated Development Environment in combination with the MX847510B, MX847520B, and MX847550B software.

Ciphering Option

W-CDMA Ciphering Option MX847510B-050

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

GSM/GPRS Ciphering Option MX847520B-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 MX847540B-050

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

LTE Ciphering Option MX847550B-050

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

*1: Does not work with MX847570B.
*2: The Integrity Algorithm does not require this option.

Upgrade Kits*

MD8475A to MD8475B Upgrade MD8475B-UG101
MD8475A to MD8475B Upgrade (with Ciphering) MD8475B-UG102
MD8475A to MD8475B Upgrade (with SIDE) MD8475B-UG103
MD8475A to MD8475B Upgrade (with Ciphering/SIDE) MD8475B-UG104
MD8475A to MD8475B Upgrade MD8475B-UG201
MD8475A to MD8475B Upgrade (with Ciphering) MD8475B-UG202
MD8475A to MD8475B Upgrade (with SIDE) MD8475B-UG203
MD8475A to MD8475B Upgrade (with Ciphering/SIDE) MD8475B-UG204

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-070 Multi-signalling Unit, the legacy unit must be changed to the MD8475B-070 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.

eMSU Upgrade MD8475B-UG171
eMSU Upgrade MD8475B-UG271

The MD8475A-011, MD8475A-050 and MD8475A-070 can be changed to the MD8475B-071 when upgrading the MD8475A to the MD8475B.

eMSU Upgrade MD8475B-UG179
eMSU Upgrade MD8475B-UG279

The MD8475B-070 can be changed to the MD8475B-071.

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.

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

Signalling Tester MD8475B SmartStudio System Configuration

System		LTE		W-CDMA	TD-SCDMA	GSM
		LTE-A	LTE			
Unit		Signalling Tester MD8475B				
Unit Option		Extended RF MD8475B-002				
		Fading IO Option MD8475B-004				
Platform Software		Multi-cell Software MX847502B				
		—		Multimedia Interface Software MX847508B		
		—		AMR-WB MX847508B-001	—	—
Basic Configuration	Hardware	Multi Signalling Unit MD8475B-070				GSM Signalling Unit MD8475B-020
		Enhanced Multi-signalling Unit MD8475B-071		—	—	—
	Software	LTE Simulation Software MX847550B		W-CDMA Simulation Software MX847510B	TD-SCDMA Simulation Software MX847540B	GSM/GPRS Simulation Software MX847520B
Options		LTE 2×2 MIMO Option MX847550B-020		HSPA Evolution/ DC-HSDPA Option MX847510B-011	—	—
		LTE 4×4 MIMO Option MX847550B-021				
		LAA Option MX847550B-030	—			
		LTE Carrier Aggregation Option MX847550B-040				
		LTE Carrier Aggregation DL3CCs Option MX847550B-041				
		LTE Carrier Aggregation DL4CCs Option MX847550B-042				
		LTE Carrier Aggregation DL5CCs Option MX847550B-043				
		LTE RoHC Option MX847550B-060				
Support Service		MX847570B 1 Year Support Service MX847570B-SS110				
User Interface		SmartStudio MX847570B				
SmartStudio Licence	System Option	LTE Option MX847570B-050		W-CDMA Option MX847570B-010	TD-SCDMA Option MX847570B-040	GSM Option MX847570B-020
		LTE Carrier Aggregation Option MX847570B-051	—	HSPA Evolution/ DC-HSDPA Option MX847570B-011		
		LTE Licensed Assisted Access (LAA) Option MX847570B-052				
	IMS	Extended CSCF Option MX847570B-080				
		IMS Supplementary Service Option MX847570B-081				
		RCS Basic Option MX847570B-083				
		GBA Authentication Option MX847570B-084				
		IMS Early Media Option MX847570B-085				
		RTP Frame Control Option MX847570B-086				
	WLAN	WLAN Offload Basic Option MX847570B-070				
		ePDG Option MX847570B-071				
		ANDSF Option MX847570B-072				
		Extended ePDG Option MX847570B-073				
	Scripting Option	IMS Script Basic Option MX847570B-060				
		XCAP Script Option MX847570B-061				
	Technical Support Service	MX847570B-060 1 Year Technical Support Service MX847570B-TS160				
		MX847570B-061 1 Year Technical Support Service MX847570B-TS161				
Remote Interface		Quick TRX Diagnosis MX847506B				
		SmartStudio Manager MX847503A				
		Smartphone Control Platform MX847504A				
eCall Option		eCall Tester (Perpetual License) MX703330E-PL010		eCall Tester (Perpetual License) MX703330E-PL010	—	eCall Tester (Perpetual License) MX703330E-PL010
		—		MSD ERA GLONASS Option MX703330E-031	—	MSD ERA GLONASS Option MX703330E-031
		—		EGTS Server ERA GLONASS Option MX703330E-032	—	EGTS Server ERA GLONASS Option MX703330E-032
		NG112 LTE eCall Option MX703330E-041		Multi-Cell Option MX703330E-061	—	Multi-Cell Option MX703330E-061
		MX703330E 1-Year Support Service MX703330E-SS110		MX703330E 1-Year Support Service MX703330E-SS110	—	MX703330E 1-Year Support Service MX703330E-SS110

Signalling Tester MD8475B

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: ≤5 × 10^{-8} (10 minutes after power-on, referenced to frequency 24 hours after power-on)
	  Aging rate: 2 × 10^{-8}/day, ≤1 × 10^{-7}/year (referenced to frequency 24 hours after power-on)
	  Temperature characteristics: ≤5 × 10^{-8}
	  Frequency Accuracy at Shipment: ±2.2 × 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)
	  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)

CE		
	EMC	2014/30/EU, EN61326-1, EN61000-3-2
	LVD	2014/35/EU, EN61010-1
	RoHS	2011/65/EU, EN50581

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
MD8475B-005	IP Extension Option
	Software options
MX847502B	Multi-cell Software
MX847506B	Quick TRX Diagnosis
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-050	LTE Option
MX847570B-051	LTE Carrier Aggregation Option
MX847570B-052	LTE Licensed Assisted Access (LAA) Option
MX847570B-060	IMS Script Basic Option
MX847570B-061	XCAP Script Option
MX847570B-062	IMS Log Import 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
MX847570B-086	RTP Frame Control Option
	LTE system
MD8475B-070	Multi-signalling Unit
MD8475B-071	Enhanced Multi-signalling Unit
MX847550B	LTE Simulation Software
MX847550B-020	LTE 2×2 MIMO Option
MX847550B-021	LTE 4×4 MIMO Option
MX847550B-030	LTE Licensed Assisted Access (LAA) Option
MX847550B-040	LTE Carrier Aggregation Option
MX847550B-041	LTE Carrier Aggregation DL3CCs Option
MX847550B-042	LTE Carrier Aggregation DL4CCs Option
MX847550B-043	LTE Carrier Aggregation DL5CCs Option
MX847550B-060	LTE RoHC Option
MX847550B-070	LTE 20 Layers Extension Option
	W-CDMA system
MD8475B-070	Multi-signalling Unit
MX847510B	W-CDMA Simulation Software
MX847510B-011	HSPA Evolution/DC-HSDPA Option

Model/Order No.	Name
	GSM system
MD8475B-020	GSM Signalling Unit
MX847520B	GSM/GPRS Simulation Software
	TD-SCDMA system
MD8475B-070	Multi-signalling Unit
MX847540B	TD-SCDMA Simulation Software
	Automation tools
MX847503A	SmartStudio Manager
MX847503A-601	SSM Test PKG European eCall
MX847503A-701	SSM Test PKG GOST 33467
MX847503A-923	eCall Tester Control Library
MX847504A	Smartphone Control Platform
Z1813A	USB Dongle (Automation)
	Scenario tools
MX847580B	SIDE Execution Software
MX847580B-018	SIP Execution Option
	Automotive applications
MX703330E-PL010	eCall Tester (Perpetual License)
MX703330E-031	MSD ERA GLONASS Option
MX703330E-032	EGTS Server ERA GLONASS Option
MX703330E-041	NG112 LTE eCall Option
MX703330E-061	Multi-Cell Option
	Ciphering Options
MX847510B-050	W-CDMA Ciphering Option
MX847520B-050	GSM/GPRS Ciphering Option
MX847540B-050	TD-SCDMA Ciphering Option
MX847550B-050	LTE Ciphering Option
	Software support services
MX847570B-SS110	MX847570B 1 Year Support Service
MX703330E-SS110	MX703330E 1 Year Support Service
	Technical support services
MX847570B-TS160	MX847570B-060 1 Year Technical Support Service
MX847570B-TS161	MX847570B-061 1 Year Technical Support Service
MX703330E-TS110	MX703330E 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□03	MD8475A to MD8475B Upgrade (with SIDE)
MD8475B-UG□04	MD8475A to MD8475B Upgrade (with Ciphering/SIDE)
MD8475B-UG□70	MSU Upgrade
MD8475B-UG□71	eMSU Upgrade (MD8475A to MD8475B)
MD8475B-UG□79	eMSU Upgrade (MD8475B-070 to MD8475B-071)
	Warranty
MD8475B-ES210	2 Years Extended Warranty Service
MD8475B-ES310	3 Years Extended Warranty Service
MD8475B-ES510	5 Years Extended Warranty Service

∗: 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)

Signalling Tester MD8475B

Model/Order No.	Name
	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)
J1398A	N-SMA ADAPTOR
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)
J1674A	SMA/P-SMA/P Soft Rigid Cable
J1674E	SMA/P-SMA/P Soft Rigid Cable (5 pcs)
J1674K	SMA/P-SMA/P Soft Rigid Cable (10 pcs)
MN8150A	RF Combiner Unit
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)
Z1858A	Divider (2 way)
Z1859A	Divider (3 way)
Z1908D	Standard Laptop for SSM
Z1919B	Standard Desktop for WLAN