Product Introduction

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MD8470A Signalling Tester

MD8470A Signalling Tester MX847010A W-CDMA/GSM Simulation Kit -Product Introduction -



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- **1. Present Condition of Mobile UE Application Testing**
- 2. Anritsu Mobile UE Test Solutions
- 3. Product Overview and Features
- 4. Platform/Interfaces
- 5. Application Test Examples
- 6. External Control Interface
- 7. Units/Options/Software
- 8. Support Service Outline





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1. Present Condition of Mobile UE Application Testing



Market Trend



The focus of UE development is shifting increasingly from fundamental communication technologies to applications due to the sophistication of functions and services for mobile terminals.

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Current Status of UE Application Testing

This is the current UE application test situation:

Test environment	Advantage	Disadvantage
Real network	Actual mobile network Realistic	 Requires on-site testing (especially for communication systems specific to other countries) Communication status cannot be set freely
Test bench	 Similar to real network Status changed freely to some extent 	 Very expensive Wastes time due to small number of in-house facilities and operator test benches
Hardware BTS simulator	 Status changed freely Lower cost than test bench 	 Expensive Limited users Restricted supported functions
RF Tester base simulator	 Low cost Simple operability 	 Many restrictions (only some call processing patterns and parameters can be changed) Unsuitable for testing UE applications because specialized for RF measurements
Software simulator	Handy and very low cost	No communications support

The UE application test market requires application testers positioned between Hardware BTS simulators and RF Tester base simulators.

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2. Anritsu Test Mobile UE Solutions



Anritsu Mobile UE Test Solutions



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Anritsu Protocol/Application Test Solutions



3. Product Overview and Features

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Personal Benchtop Global Mobile Communications Network for Wireless Application Developers

Packet data services and 3G systems are growing globally in today's wireless market. Factors for succeeding in the wireless business are shifting from basic communication technology to the ability to plan and develop attractive mobile devices and services.

The MD8470A Signalling Tester helps wireless application engineers accelerate the development and reduce the test cycle for these products and services.





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Product Overview and Features (1/4)

(1) The all-in-one platform supports functional testing of UE applications such as voice and video calling, contents download, and messaging.



Product Overview and Features (2/4)

(2) Supports Basic Call Processing

Basic call processing (voice/video/packet call/SMS/MMS) is supported as standard for W-CDMA/ HSDPA/HSUPA, and voice/packet call/SMS/MMS are supported for GSM/GPRS/EGPRS.

Supported functions (sample scenarios for following connection tests)

System		Function	Description		
		Handset/Loopback	Performs loopback or handset communication test		
	Voice Call	End-to-End	Performs end-to-end voice call test between two sets of MS *Two sets of MD8470A are used.	*As of September	r 2010
		Loopback	Performs video call loopback test		
	Video Call	End-to-End	Performs end-to-end video call test between two sets of MS *Uses two sets of MD8470A		
	W	-CDMA Packet Communications	Performs application tests utilizing packet data communications by con *Can change rate (DL;64/128/384 Kbps)	nnecting to server	
		HSDPA (1.8W3.6W7.2M) Packet Communications	Performs application tests utilizing packet data communications by con *Uses MX847010A-11 HSDPA Software (option)	nnecting to server	
	HSU	PA (2.0M) Packet Communications	Performs application tests utilizing packet data communications by con *Uses MX847010A-12 HSUPA Software (option) *Provided by MD8470A web download support service (MX847010A-20	nnecting to server	
W-CDMA/	W-CI	DMA PPP Packet Communications	Performs PPP (Built-in server/Serial) packet data communication test		
HSPA		HSDPA (1.8W3.6W7.2M) PPP Packet Communications	Performs PPP (Built-in server) packet data communication test *Uses MX847010A-11 HSDPA Software (option)		
	Multiple PDP Context Perform Multiple PDP packet communication test				
		SMS (Short Message Service)	Performs SMS (7bit-ASCII, Unicode, Binary) test *Uses SMSC (SMS Centre)		
	V	V-CDMA Cell Broadcast (BMC)	Performs W-CDMA Cell Broadcast test		
	UD	I (Unrestricted Digital Information)	*Uses MU847090B ISDN Interface (option) *Provided by MD8470A web download support service (MX847010A-20))	
		SS (Supplementary Services)	Offers various sample scenarios for supplementary services, such as waiting/USSD, etc. *Provided by MD8470A web download support service (MX847010A-20	Emergency call/Multiparty/Call	
	N	N-CDMA 2Cell Hard Handover	Performs W-CDMA Hardhandover test between W-CDMA 2Cells (Voic *Uses MX847016A Multi-cell Network Simulator (option) *Provided by MD8470A web download support service (MX847010A-20	:e/Packet DL384k_UL64k).))	

*W-CDMA: Requires MU847010B W-CDMA/HSPA Signalling Unit and MX847010A W-CDMA/GSM Simulation Kit *W-CDMA 2Cell HHO: Requires MD8470A-02 Second RF Option, two MU847010B W-CDMA/HSPA Signalling Units



Product Overview and Features (3/4)

(2) Supports Basic Call Processing (Cont.)

Basic call processing (voice/video/packet call/SMS/MMS) is supported as standard for W-CDMA/ HSDPA/HSUPA, and voice/packet call/SMS/MMS are supported for GSM/GPRS/EGPRS.

Supported functions (sample scenarios for following connection tests)

System		Function	Description	
		Handset	Performs handset communication test	* As of September 2010
	voice Call	Loopback	Performs loopback communication test	
	GPRS Pac	ket Communications	Performs application tests utilizing GPRS packet data communications by conne	ecting to server
	EGPRS Pa	cket Communications	Performs application tests utilizing EGPRS packet data communications by cont *Uses MX847010A-01 EGPRS Software (option)	necting to server
		GSMCSD	Performs GSM circuit switched data (CSD) communication test	
GSM/GPRS/ EGPRS	DTM (Di	ual Transfer Mode)	Performs GSM (CS: Voice) + GPRS (PS: Packet) simultaneous communication *Uses MU847020B GSM Singalling Unit *Performs GSM (CS: Voice) + EGPRS (PS: Packet) DTM test by using MX8470	test 10A-01 EGPRS Software (option)
	SMS (Sho	rt Message Service)	Performs SMS (7bit-ASCII, Unicode, Binary) test *Uses SMSC(SMS Centre)	
	GSM Cell	Broadcast (SMSCB)	Performs GSM Cell Broadcast test	
	SS (Supp	lementary Services)	Offers various sample scenarios for supplementary services, such as Emergency etc. *Provided by MD8470A web download support service (MX847010A-20)	call/Multiparty/Call waiting/USSD,
	GSM	2Cell Handover	Performs GSM Handover test between GSM 2Cells (Voice: EFS/Packet: GPRS) *Uses MX847016A Multi-cell Network Simulator (option) *Provided by MD8470A web download support service (MX847010A-20)	
	W-CDMA<-	>GSM/GPRS/EGPRS	Performs Inter-RAT test between W-CDMA and GSM/GPRS (Cell Reselection/Vo *Performs Inter-RAT test between W-CDMA and EGPRS by using MX847010A-0	bice/Packet). 1 EGPRS Software (option)
Inter-RAT Handover	HSD	PA<->EGPRS	Performs Inter-RAT test between HSDPA and EGPRS. *Uses MX847010A-01 EGPRS Software (option) *Uses MX847010A-11 HSDPA Software (option) *Provided by MD8470A web download support service (MX847010A-20)	

*GSM/GPRS: Requires MU847020B GSM Signalling Unit and MX847010A W-CDMA/GSM Simulation Kit *GSM 2Cell HHO: Requires MD8470A-02 Second RF Option, two MU847020B GSM Signalling Units *Inter-RAT: Requires MD8470A-02 Second RF Option, MU847010B W-CDMA/HSPA Signalling Unit and MU847020B GSM Signalling Unit

Product Overview and Features (4/4)

(3) Supports Multiple Communication Standards (W-CDMA/HSDPA/HSUPA, GSM/GPRS/EGPRS)

Complies with the world's major 2G, 2.5G, 3G and 3.5G mobile GSM/GPRS/EGPRS and W-CDMA/HSDPA/HSUPA communications standards

(4) Covers 400 to 2700 MHz Frequency Range

Easily supports further system expansion by covering wide frequency range of 400 to 2700 MHz seamlessly



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4. Platform/Interfaces





Platform/Interfaces (1/2)

- The BTS is simulated by installing the communication system hardware and control software.
- Ethernet, ISDN, Handset, and Serial I/O interfaces supporting various data communication services
- Small-footprint chassis for use in personal benchtop simulation environment (281 (D) x 426 (W) x 221.5 (H) mm)



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Platform/Interfaces (2/2)

 Simulations controlled without remote PC (Windows[®] XP installed in built-in PC*)

> *Built-in PC specifications: OS: Windows[®] XP Professional CPU: Mobile Intel[®] Pentium[®]4 1.7 GHz HDD: 40 GB RAM: 512 MB

*Windows is a registered trademark of Microsoft Corporation in the USA and other countries. *Intel Pentium is a registered trademark of Intel Corporation in the USA and other countries.

 An application server is installed in the MD8470A built-in PC. A single platform can perform functional testing of applications using packet communications by connecting the Call Proc Ethernet and Ethernet (0 or 1) of the MD8470A built-in PC. (An external server can also be connected.)



A remote control PC is not required and a single platform offers a development environment including the application server.

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5. Application Test Examples





MX847010A W-CDMA/GSM Simulation Kit (1/4)

MX847010A W-CDMA/GSM Simulation Kit (V7.02)

WNS: Wireless Network Simulator

This application simulates interactive network operations. The user sets the test parameters using a GUI.



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CNS: Couple-UE Network Simulator

This application simulates interactive network operations. The user performs end-to-end UE testing with the MD8470A using a GUI

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Script Based Simulation

Simulations are executed by creating scenarios defining BTS operations at the L3 level.





MX847010A W-CDMA/GSM Simulation Kit (2/4)

WNS (Wireless Network Simulator)



- This application simulates interactive BTS operations^{*1}. A bearer is started adaptively by the UE request.
- Using GUI operations, the user sets the test parameters without editing complex scenarios.
- The call processing state is displayed graphically.
- The virtual UE performs origination and termination.

*1: The WNS may not support all mobile terminals.



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MX847010A W-CDMA/GSM Simulation Kit (3/4)

CNS (Couple-UE Network Simulator)





- This application simulates interactive BTS operations^{*1}. A user can perform end-to-end UE tests with a MD8470A by simple GUI operations^{*2}.
- A bearer is started adaptively by the UE request.
- Using GUI operations, the user sets the test parameters without editing complex scenarios.
- The call processing state is displayed graphically.
- *1: The CNS may not support all mobile terminals.
- *2: Requires Second RF option and two W-CDMA Signalling Units or two GSM signalling Units.



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MX847010A W-CDMA/GSM Simulation Kit (4/4)

Script Based Simulation

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	2 1 S A 7 7			
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1333	MAC DATA SEG	D DTCH 0		00:03:50,320
13335 4	W1 FHY_DATA_REQ	D DCH 0		00:03:50.330
13336	UL FHY_DATA_IND	N DCH 0		00:03:50.430
13337	MAC_DATA_IND	U DICH O		00103150,430
	PLC AN DATA DEC	D DODE 1 DEL P	TITATE I	00103130.440
13340 -	MAC_DATA_REQ	D TCCH 3	Control 2	00:03:50.450
13341 -	MAC_DATA_REG	D ICLU 3		00:03:50.450
1342 -	MAC_DATA_REQ	D DOOR 3		00103150.450
13344 4	NI FHY DATA REQ	D ICH 4		00:03:50,450
	00:03:50.480			
13346	MAC_DATA_REQ	D DTCH 0		00:03:50.490
TATE INT	Channel - Se45 CH_No + 0	3x40 Type = 0x4031 Type2 = 0 M03 Opt1 = 0x0001 Opt2 = 0x0	s00 Unit = 0x00 000 Message Length = 56 bytes	
STATE CS ATTACH	RRC NAS SMS			1
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- Provides library function for creating C scenarios compatible with MD8480A/B to define simulations freely at L3 level
- Supports bearers such as voice call, packet communications, and video call (W-CDMA)
- Control software supports execution of simulations, real-time data trace, and decode analysis of protocol messages
- Provides sample reference scenarios

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Application Test Examples

MD8470A Application Test Examples

5-1. Applica	tion test	environment	accomplished	by very	simple operati	ion
-WNS (V	Vireless I	Network Simu	ulator)-			

5-2. End-to-end test environment accomplished by very simple operation -CNS (Couple-UE Network Simulator)-

5-3. Voice Call (Handset/Loopback/End-to-End UE Test)

5-4. Access Class Barred (Rel. 99)

5-5. Web Browsing/Contents Download

5-6. UMTS Video Call (Loopback/End-to-End UE Test)

5-7. Messaging (SMS/MMS)

5-8. Cell Broadcast (SMSCB/BMC)

5-9. Service Interruption Test

5-10. Inter-System Handover Test (Inter-RAT)

5-11. Supplementary Services (SS) Test (Emergency Call/Multiparty/Call Waiting/USSD...)

5-12. Protocol Analysis (RRC, NAS (RR,MM,CC,GMM,SM), SS, SMS, IP, WAP, H.245)

5-1. Application Test Environment by Simple GUI Operation WNS: Wireless Network Simulator



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5-1. WNS: Wireless Network Simulator (1/8)

• Simulates interactive BTS operations*1

The basic connection tests can be performed without knowledge of scenarios. (W-CDMA/HSDPA (1.8M/3.6M/7.2M/10.2M/14.4Mbps)/HSUPA (1.46M/2.0M/5.76Mbps), and GSM/GPRS/EGPRS are supported).

- Effective for testing UE applications (on U-plane)
 - Voice call, Video call, Browsing/contents download,
 - SMS (7-biit ASCII, Unicode, Binary), MMS, Service Interruption Test, etc.

-Features -

- Interactive operation through simple UE connections^{*1}
- Implements actions from network and UE sides



*1: The WNS may not support all mobile terminals.

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5-1. WNS: Wireless Network Simulator (2/8)



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5-1. WNS: Wireless Network Simulator (3/8)

Main WNS Features

Supported Bearers	W-CDMA/HSDPA (*1) HSUPA(*2)	*Voice Call (Orig./Term.), Packet (Orig./Term.), Video Call [] oopback](Orig./Term.), Multi-call	PPP (Built-in server) Packet (Orig.)
	GSM/GPRS/EGPRS(*3)	*Voice Call (Orig./ Term.). Packet (Orig./Term.)	
		*Client IP Address Setting/Server IP address	etting/Router Connection Setting,
	Common	*RF Level Setting	
		*Band setting (Band I, II, III, IV, V, VI, VII, VIII, IX,)	X, Not Specified)
		*Channel Setting, *Registration Type Setting, */	Activation Time Setting (Voice, Packet, Video, MultiCall)
		*Packet Window Size Setting, *Video Phone Se	etting (ISDN/Loopback)
Setting Parameters	W-CDMA/HSDPA (*1) HSUPA(*2)	*Packet Rate setting (DL64k/UL64k, DL128k/UL64k, DL384k/UL64 DL3.6WUL384k, DL7.2WUL384k, DL10.2W DL3.6WUL1.46M, DL7.2WUL1.46M, DL10.2I DL7.2WUL2.0M, DL10.2WUL2.0M, DL14.4M DL10.2WUL5.76M, DL14.4WUL5.76M, DL H	4k, DL384k/UL128k, DL384k/UL384k, DL1.8M/UL384k, UL384k, DL14.4M/UL384k, DL HS-Auto/UL384k, DL1.8M/UL1.46M, M/UL1.46M, DL14.4M/UL1.46M, DL1.8M/UL2.0M, DL3.6M/UL2.0M, I/UL2.0M, DL1.8M/UL5.76M, DL3.6M/UL5.76M, DL7.2M/UL5.76M, IS-Auto/UL HS-Autoo)
		*Frequency Band Setting (GSM450, GSM480, G	GSM850, P-GSM900, E-GSM900,
		R-GSM900, DCS1800, PCS1900)/ARFCN(CCI	H, TCH)
		*Slot Setting (DL1/UL1. DL1/UL3. DL1/UL4. DL	.2/UL1. DL2/UL3. DL3/UL1. DL4/UL1. DL1/UL2. DL2/UL2. DL3/UL2)
	GSM/GPRS/EGPRS(*3)	*GPRS /Coding Scheme Setting (CS1, CS2, CS	S3. CS4)
		*EGPRS/Modulation and Coding Scheme Settin DL: MCS1, MCS2, MCS3, MCS4, MCS5, I UL: MCS1, MCS2, MCS3, MCS4, MCS5, I	ng MCS6, MCS7, MCS8, MCS9 MCS6, MCS7, MCS8, MCS9
	USIM	*USIM Parameter Setting (MCC, MNC, IMSI, Tes	st USIM_MODE, K, RAND, AUTN, IK)
	*Edit and Transmission of SM	//S(CS/PS)/Display of Received SMS (7-bit ASCII/	Unicode/ Binary)
	*SMS Status Report Function		
	*Continuous SMS Sending Fi	unction	
	*SMS Output Interface		
	*RTS Output Dowor Sotting by	on Test (Requires Separate MINS Application Serv	ver)
	*Emorgonov Call New	(GOT (T-ub Step)	
	*Access Class Barred (Rel 9	9) (Normal/Barred/Emergency)	
Other Functions	*Out-of-Service Setting		
	*Packet Preservation Setting	Function	
	*RRC Status Change setting	(Cell DCH ⇔ Cell FACH ⇔ Cell PCH)	
	*State Transition Diagram for	Call Processing/CS/PS Attach Status Indicator	
	*MO/MT (Manual and Auto An	swer) Operation by Virtual Terminal	
	*International Phone ID Func	tion	*1: Requires MX847010A-11 HSDPA Software Option
		D/Pounhana Termination Sotting	T. Requires mixed for the result of the resu
	*Show ID/Hide ID/Unknown II		*2. Poquiros MX8/7010A-12 HSLIPA Software Option
	*Show ID/Hide ID/Unknown II *DTMF Checking by Tone and	d Display	*2: Requires MX847010A-12 HSUPA Software Option

5-1. WNS: Wireless Network Simulator (4/8)

Basic Call Processing Support Supports following basic call processing: -<u>W-CDMA/HSDPA/HSUPA</u>:

Voice Call/Video Call/Packet Call/ Multi-call/SMS/MMS

-GSM/GPRS/EGPRS:

Detach

Registration

Voice Call/Packet Call/SMS/MMS



Displaying Status and Connection

When a UE or connection target performs the process, a line showing the connection target lights or flashes. In addition, the corresponding process is highlighted, so the user can confirm the connection status visually between the UE and connection target.

 dife
 Substration

 Origination
 Termination

 Communication
 Visco

 UE Release
 NW Release

 W Release
 BTS1

 40 dBm

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5-1. WNS: Wireless Network Simulator (5/8)

BTS Output Power Setting

During simulation, the (DL) RF signal power output from the BTS simulator can be changed (1dB steps) easily at the BTS Power window^{*1}.

*1: Only supported when UE status set to Power Off, Idle, or Communication





5-1. WNS: Wireless Network Simulator (6/8)



Out-of-Service Setting

The WNS can simulate out-of-service operation by selecting Out of Service in the Virtual Phone command mode^{*1}.

*1: Only when UE status set to Power Off, Idle, or Communication





When the OK button on the out-of-service confirmation window is clicked, the BTS power is turned on. If the WNS is in the Communication state at this time, it changes to the Idle state.

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5-1. WNS: Wireless Network Simulator (7/8)

Operation/Display by Virtual Phone

The virtual phone performs UE termination and NW release of a voice call, packet communication, and video call loopback.



ID:	0123456789	
	ernational	
⊙ Sh	ow ID O Hide ID O Unknown ID O Payphone	
Auto Answ	er:	1
Oon	Answering Time: 5 💓 [s]	
SMS Loop	back Phone ID:	7
ID:	001122334455	
SMS Ac	O PS	

The Virtual Phone Setup window is used to set the phone number (domestic/international), Show ID, Hide ID, Unknown ID, Payphone, automatic/manual answering for incoming voice calls, and automatic answering time.

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SMS

Packet Terminate

Packet Release Video Off Hook

Video On Hook 0 1 1 0 ··· 0 Virtual Phone Setup

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#



5-1. WNS: Wireless Network Simulator (8/8)

Call Processing State Transition Diagrams



5-2. End-to-End Test Environment by Simple GUI Operation CNS (Couple-UE Network Simulator)



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5-2. CNS: Couple-UE Network Simulator (1/3)

The CNS application software allows the user to perform end-to-end UE application tests with one MD8470A unit. Using the CNS and additional hardware options, one MD8470A unit supports the network simulation functions for voice call, video call and SMS/MMS^{*1} between two UE units (even different operators).

This unique solution provides an effective test environment to verify application connectivity.



*1: Requires separate MMS application server.

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5-2. CNS: Couple-UE Network Simulator (2/3) **Merits of CNS**

- End-to-end UE tests using only one MD8470A unit with small footprint for configuring personal benchtop simulation environment
- End-to-end UE tests by simple GUI operation
- Interactive BTS operations^{*1} without knowledge of scenarios
- End-to-end SMS/MMS^{*2} tests between UE sets of different systems (W-CDMA<->GSM)
- IP Packet communications from two UE sets to one application server simultaneously
- Service interruption tests, such as voice call termination from other UE during IP • packet communications
- Control software executed for each UE in CNS to save and analyze trace logs for • each UE after end-to-end tests



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5-2. CNS: Couple-UE Network Simulator (3/3)

CNS Supported End-to-End UE Tests

	Required Hardware Option	Supported End-to-End UE Tests
W-CDMA End-to-End UE Test	 MD8470A-02 2nd RF Option MU847010B W-CDMA Signalling Unit MU847010B W-CDMA Signalling Unit 	Voice Call Video Call SMS, MMS ^{*1}
GSM End-to-End UE Test	 MD8470A-02 2nd RF Option MU847020B GSM Signalling Unit MU847020B GSM Signalling Unit 	Voice Call SMS, MMS ^{*1}
W-CDMA/GSM End-to-End UE Test	- MD8470A-02 2nd RF Option - MU847010B W-CDMA Signalling Unit - MU847020B GSM Signalling Unit	SMS, MMS ^{*1}



*1: Requires separate MMS application server.

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5-3. Voice Call Handset, Loopback, End-to-End UE Tests

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5-3. Voice Call – Handset/Loopback/End-to-End UE Test- (1/3)

Voice Call Test (Handset/Loopback)

A voice call test is performed between a UE and handset by connecting the handset (standard accessory) to the MD8470A. Also, voice loopback^{*1} in the MD8470A performs a voice call test.

 \checkmark





*1: Loopback supported by sample scenario.

Each caller ID can be set for voice calls from the WNS virtual phone to the mobile terminal.

Phone ID Setting	
D	Sets phone number of virtual phone
International	Sets international call
Show ID	Sets announcement of caller's phone number
Hide ID	Hides announcement of caller's phone number
Unknown ID	Disables announcement of caller's phone number
Payphone	Sets caller's phone number to payphone

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5-3. Voice Call – Handset/Loopback/End-to-End UE Test- (2/3)

Emergency Call Test

- WNS provides a function to test emergency calls originated from a mobile UE.
- Emergency is displayed on the WNS virtual phone after the mobile UE originates the emergency.
- Emergency call testing is supported with or without a Test USIM.



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5-3. Voice Call –Handset/Loopback/End-to-End UE Tests– (3/3) Voice Call Test (End-to-End UE Test)

By using CNS (Couple-UE Network Simulator), an end-to-end voice call test can be performed with one MD8470A^{*1} using a simple GUI.

*1: See slide 36 for required hardware and supported tests.



Also, end-to-end UE voice call testing^{*2} can be performed between two mobile UE sets by connecting them to two MD8470A sets connected by an Ethernet LAN cable (crossover type)



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5-4. Access Class Barred (Rel. 99) Normal, Barred, Emergency





5-4. Access Class Barred (Rel. 99)

Access Class Barred

- When the network sets access control parameters in the system information, call origination is restricted.
- Release 99-compliant restriction conditions can be set using the WNS Access Class Control window.
- Many application tests can be performed under restriction conditions, which is difficult on a live network.



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5-5. Web Browsing, Contents Download



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5-5. Web Browsing/Contents Download (1/11)

Packet Communication Test (Internal Server)

A single platform can perform functional testing of applications utilizing packet communications when an application server is installed in the MD8470A built-in PC.





Connect Call Proc Ethernet to the Ethernet (0 or 1) of the MD8470A built-in PC.

*Using application server installed in MD8470A built-in PC





5-5. Web Browsing/Contents Download (2/11)

Packet Communication Test (External Server)

External connection of various application servers supports functional tests of applications using packet communications.



*Using external application server

The standard-installed router connect function offers packet transmission to a different subnet via a router.



5-5. Web Browsing/Contents Download (3/11) Packet Rate Setting

- Using WNS supports setting of W-CDMA/HSDPA^{*1}/HSUPA^{*2} Packet Rate at test start
- Easy packet communications testing for each bearer environment



5-5. Web Browsing/Contents Download (4/11)

Data Throughput Testing (Throughput Monitor Function)

- The built-in Throughput Monitor function^(*1) supports monitoring of IP data throughput performance and MAC-hs/e performance^(*2) in real time.
- Actual data throughput performance can be verified at a fixed rate or at a rate set decided by UE category and CQI value in HSDPA/HSUPA.
- An efficient development environment for optimizing terminal throughput is easily configured.



*1: Requires Version 6.00 or later of MX847010A W-CDMA/GSM Simulation Kit. *2: Requires Version 7.00 of MX847010A W-CDMA/GSM Simulation Kit.

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5-5. Web Browsing/Contents Download (5/11)

Measure Function

- The new built-in measure function on MX847010A V7.00 supports monitoring of Layer 1 and Layer 2 communication performance.
- Since some parameters such as CQI, ACK/NACK, BLER can be measured on the newly designed GUI, it allows users to configure effective test environment for determining failure during data throughput test by combining existing throughput monitor.
- Collected data using measure function can be saved as CSV format which offers offline analysis after testing.



5-5. Web Browsing/Contents Download (6/11)

Packet Preservation Function

- The PDP Context Preservation state occurs frequently on live networks when radio communications are broken off in tunnels, etc., or when the network is conserving radio resources.
 - Important to confirm normal mobile UE application operation when packet communications re-established
 - Network-indicated PDP Context Preservation executed easily using WNS



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5-5. Web Browsing/Contents Download (7/11)

RRC Status Change (1/2)

- The status of the Cell used by the mobile terminal is transitioned while packets are not moving during packet communications and the mobile terminal RRC Status is changed.
- A test environment emulating a live network can be configired at application testing using packet communications.

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5-5. Web Browsing/Contents Download (8/11) RRC Status Change (2/2)

- When the time set for no communications after packet communications has elapsed, the RRC Status transitions from "CELL DCH" via "CELL FACH" to "CELL PCH".
- In addition, when packet communications is reopened from either the network side or mobile side while there is no packet communications, the RRC status returns to "CELL DCH" via "CELL FACH" from "CELL PCH".



5-5. Web Browsing/Contents Download (9/11)

Multiple PDP Context

• The Multiple PDP Context is supported in scenario-based W-CDMA and GPRS/ EGPRS^{*1} testing *1: Requires MX847010A-01EGPRS Software Option.



Multiple PDP Context Support Functions

- The Multiple PDP Contexts listed below are supported for W-CDMA and GPRS/EGPRS.
 - Primary PDP Context
 - Primary PDP Context + Primary PDP Context
 - Primary PDP Context + Secondary PDP Context
- The following resources are allocated to each PDP Context.
 - W-CDMA: DTCH for each separate Logical Channel Number (8PDP max.)
 - GPRS/EGPRS: Each separate NSAPI (8 types max.)
- Each PDP Context is identified using the following information.
 - IPv4 Source address type
 - IPv6 Source address type
 - Protocol identifier/ Next header type
 - Single destination port type
 - Destination port range type
 - Single source port type
 - Source port range type



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5-5. Web Browsing/Contents Download (10/11)

Application Example (1): Video Streaming Test

A separate streaming server supports streaming tests using the MD8470A's packet communications function.



Connect Call Proc Ethernet to the Ethernet (0 or 1) of the MD8470A built-in PC.

*Using streaming server installed in MD8470A built-in PC



(Streaming Server)

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5-5. Web Browsing/Contents Download (11/11)

Application Example (2):

Packet communications test using two UE sets simultaneously with MD8470A

Using CNS (Couple-UE Network Simulator), supports IP packet communications from two UE sets to one application server simultaneously^{*1}. It is also possible to configure an even smaller footprint personal simulation environment by using the built-in PC as an application server.



*1: Requires Second RF Option and two W-CDMA Signalling Units or two GSM Signalling Units.

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5-6. UMTS Video Call Loopback, End-to-End UE Tests

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5-6. UMTS Video Call –Loopback/End-to-End UE Tests– (1/2)

Video Call Test (Loopback)

The video call loopback test is performed using WNS.



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5-6. UMTS Video Call –Loopback/End-to-End UE Tests– (2/2)

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

Using CNS (Couple-UE Network Simulator), supports end-to-end video call tests with a MD8470A^{*1} using simple GUI operation.

*1: See slide 36 for the required hardware and supported tests.
UE_1
UE_2
<pUE_2</p>
UE_2
UE_2
<pUE_2</p>
<pUE_2</p>
UE_2</p

Also, end-to-end UE video call testing^{*2} can be performed between two mobile UE sets by connecting them to two MD8470A sets connected by an Ethernet LAN cable

(crossover type).



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5-7. Messaging (SMS/MMS)



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5-7. Messaging (SMS/MMS) (1/10)

MMS Test System Simulation Model

The MD8470A supports the testing of MMS (Multimedia Messaging Service), which is becoming more common in GSM/GPRS/W-CDMA (UMTS).



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5-7. Messaging (SMS/MMS) (2/10)

MMS Test System Architecture [1]

Establishment of a test system combining the WNS(Wireless Network Simulator), SMSC (SMS Centre), MMSC (MMS Centre)^{*1} and WAP Gateway supports testing of MMS transmit functions (MMS Submit) and receive functions (MMS Notification/MMS Retrieval).



*1: Requires separate MMS application server.

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5-7. Messaging (SMS/MMS) (3/10)

MMS Test System Architecture [2]

- When the MMSC^{*1} is installed in the MD8470A built-in PC, one MD8470A unit can perform MMS testing.
- The WAP Gateway (Kannel) is installed in MD8470A and is supported when the MMSC is running in the MD8470A.



*1: Requires MMS application server.

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5-7. Messaging (SMS/MMS) (4/10)

What is SMSC?

- SMSC is software that runs as a SMS Centre and mediates SMS messages between an MMSC and WNS.
- The contents of received messages can be confirmed by the GUI.

*SMSC is installed as standard in the MD8470A.

SMSC (SMS Centre)





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5-7. Messaging (SMS/MMS) (5/10)

		VVIIG	
SMS/MMS Time stamp	Orininator Destina Messa Enr. Queueing	•	T
ME 2005/07/22 23:18:58+09:00 ME 2005/07/22 23:18:50+09:00 SE 2005/07/22 22:34:08+09:00 SE 2005/07/22 22:31:24+09:00	Text SMS Editor Originator Address : 11111 Destination Address : International OK Destination Address : International Cancel Time Stamp : 2006/03/16 ♥ 10:09:41 ♥ GWT +09:00 ♥ ♥ User Data Header: Hello !! This message from MD8470A !	[
	Jo characters, 1 SMS message(s) Option Message Class : Class 0 Data Coding Scheme(DCS): 10 Protocol Identifier : 00 Concatenated Messages : 1 Validity Period:	•	_ _ S
SMS Loopback Phone ID: 00112233 SMS Access: O CS O I	Text SMS Editor	-	_

What is SMSC?

• Text/Binary SMS Editor

- SMSC is used for transmission/reception tests of SMS messages without MMSC. With a simple user interface, it can create and send arbitrary messages (Text SMS [7bit ASCII, Unicode], Binary SMS) using GUI-based operation.
- Possible to configure detailed settings such as Message Class (No Class, Class 0, Class 1, Class 2, Class 3) and confirm SMS Status Report requests (On/Off).

SMS Access setting

- Set the SMS message termination mode on Virtual Phone Setup of WNS
 - CS: SMS messages are terminated in CS mode.
 - PS: SMS messages are terminated in PS mode.



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5-7. Messaging (SMS/MMS) (6/10)

What is SMSC?

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

SMSC (SMS Centre)



Status Report Editor

Continuous SMS Sending Function

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





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5-7. Messaging (SMS/MMS) (7/10)

What is SMSC?

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

• SMS Forward Interface

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







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5-7. Messaging (SMS/MMS) (8/10)

Supported MMS Test Variations [1]

Various MMS evaluation tests are supported using the MD8470A.



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5-7. Messaging (SMS/MMS) (9/10)

Supported MMS Test Variations [2]

Various MMS evaluation tests are supported using the MD8470A.



UE-to-UE

/incitsu

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5-7. Messaging (SMS/MMS) (10/10)

End-to-End SMS/MMS Test with MD8470A

Using CNS (Couple-UE Network Simulator) end-to-end SMS/MMS^{*1} tests can be performed with a MD8470A^{*2} using simple GUI settings. End-to-end SMS/MMS tests between UE of different systems (W-CDMA<=>GSM) are also supported.

*2: See slide 36 for required hardware and supported tests.



CNS: Couple-UE Network Simulator

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5-8. Cell Broadcast (SMSCB/BMC)





5-8. Cell Broadcast (SMSCB/BMC) (1/2)

GSM Cell Broadcast: SMSCB (Short Message Service Cell Broadcast)

The MD8470A can send SMSCB Messages by using the CBC (Cell Broadcast Centre) application and dedicated sample scenario for CBC. Various SMSCB tests are performed by setting the transmission interval, number of retransmission times, and various other parameters.



CBC (Cell Broadcast Centre)

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5-8. Cell Broadcast (SMSCB/BMC) (2/2)

W-CDMA Cell Broadcast: BMC (Broadcast and Multicast Control)

The MD8470A supports W-CDMA Cell Broadcast testing. Users edit and run test scenarios to send CBS Messages and Schedule Messages using a new scenario library (SndBMCMessage). A sample test scenario is provided for programming reference.




5-9. Service Interruption Test





5-9. Service Interruption Test (1/4)

Service Interruption Test

SMS interruptions during voice call and voice call interruption during packet communications, etc., are easily tested using WNS.



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5-9. Service Interruption Test (2/4)

Service Interruption (Multi-Call) Test

The following service interruption tests can be performed using WNS.

WNS(W-CDMA/HSDPA/HSUPA)

	Voice Call	Video Call	SMS	MMS
Status	Interruption	Interruption	Interruption	Interruption
During Voice Call	0		0	0
During Packet Comm.*1	0	0	0	0
During Video Call			0	0

O: Testable (WNS) O: Testable (Sample Scenario)

*1: Requires MX847010A-11 HSDPA Softw are Option for HSDPA and MX847010A-12 HSUPA Softw are Option for HSUPA

WNS(GSM/GPRS/EGPRS)

	Voice Call	SMS	MMS
Status	Interruption	Interruption	Interruption
During Voice Call	0	0	0
During Packet Comm.*2	O *3	O *3	O *3

O: Testable (WNS) **O:** Testable (Sample Scenario)

*2: Requires MX847010A-01 EGPRS Softw are Option for EGPRS

*3: Only when packet data not sent

Since the MD8470A implements a web server and video call loopback function, one MD8470A unit supports some interruption tests without external equipment.





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5-9. Service Interruption Test (3/4)

Service Interruption (Multi-Call) Test in End-to-End Test Environment

Using CNS (Couple-UE Network Simulator), it is possible to perform various service interruption tests in an end-to-end test environment^{*1} with an MD8470A, such as voice call termination from another UE during IP packet communication.

*1: See slide 36 for required hardware and supported tests.

CNS (W-CDMA/HSDPA/HSUPA UE to W-CDMA/HSDPA/HSUPA UE)



Slide 75



5-9. Service Interruption Test (4/4)

DTM (Dual Transfer Mode)

- This function supports simultaneous scenario-based Dual Transfer Mode (DTM) testing for both GSM (CS: Voice) and GPRS (PS: packet communications)^{*1}. And adding the MX847010A-01 EGPRS Software option supports DTM testing for GSM (CS) + EGPRS (PS).
- Moreover, the operation of applications using packet communications during voice calling can be verified.

*1: Requires MU847020B GSM Signalling Unit.

Item	Features	Specification						
	CS/PS Frequency	Same frequency for CS/PS						
Laver1	Transmission Power Setting	CS and PS set separately						
Edyci i		Multislot operation only supported.						
	Slot Operation	(Single slot operation not supported)						
	DTM Multislot Class	5, 9, 11						
Signalling Procedure		Both of CS⇔CS+PS,						
		PS⇔PS+CS supported						
EGPRS Capability		Voice + EGPRS supported*2						
Reference Version for 3GPP		3GPP Rel. 99						

Supported DTM Specifications

*2: Requires MX847010A-01 EGPRS Software option.



Handset



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5-10. Inter-System Handover Test (Inter-RAT)

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5-10. Inter-System Handover Test (Inter-RAT)

Inter-RAT Test (w-cdma/Hsdpa⇔gsm/gprs/egprs)

- The rapid spread of dual-mode W-CDMA/GSM mobile sets means Inter-RAT is becoming a key technology in completing network compatibility.
- The MD8470A offers the following scenario-based Inter-RAT (W-CDMA/HSDPA \$GSM/GPRS/EGPRS) testing^{*1} plus wide support for application function testing and general operation verification testing of W-CDMA/GSM dual-mode mobile terminals.



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5-11. Supplementary Services (SS) Tests Emergency Call, Multiparty, Call Waiting, USSD...



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5-11. Supplementary Services (SS) Test

-Emergency Call/Multiparty/Call Waiting/USSD-

Supplementary Services Functional Tests

A scenario can freely describe the transmission/reception of messages at the Layer 3 level. Therefore, creation of corresponding scenarios supports functional tests of supplementary services.

Sample scenarios for supplementary services for GSM/GPRS and W-CDMA can be downloaded from the dedicated MD8470A web site.





5-12. Protocol Analysis –RRC, NAS (RR, MM, CC, GMM, SM), SS, SMS, IP, WAP, H.245–

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5-12. Protocol Analysis <rrc, NAS (RR, MM, CC, GMM, SM), SS, SMS> (1/3)

• When edited and compiled scenarios are loaded to the dedicated control software and executed, simulations are performed by controlling the MD8470A.

• After the test, the decode function for protocol messages (RRC, NAS [RR, CC, MM, GMM, SM], SMS, SS [Supplementary Services] Config) and a filtering function support analysis of simulation results.



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5-12. Protocol Analysis <IP, WAP> (2/3)



Displays captured TCP/IP data

TCP/IP Data Analysis

Combined use with Ethereal captures, decodes, and displays TCP/IP data at packet communications.

(Untitled) - Etherea	J			
	🖗 🖾 🖨 🖨 🖨			
Eilter:			the Expression SuQlear V Apply	
No Time	Source	Destination	Protocol Info	TP
$\begin{array}{c} 1 & 0.000000\\ 2 & 0.751038\\ 3 & 0.861285\\ 4 & 11.902323\\ 5 & 11.907486\\ 6 & 11.912169\\ 7 & 11.912196\\ 8 & 12.222277\\ 9 & 12.222329\\ 10 & 12.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 11 & 2.502275\\ 12 & 12.502275\\ 12 & 12.502275\\ 13 & 13.019118\\ 14 & 13.019118\\ 14 & 13.019118\\ 14 & 13.019118\\ 14 & 13.62190\\ 15 & 14.682190\\ 15 & 14.682190\\ 15 & 14.682180\\ 15 & 15.682011\\ 19 & 17.801989\\ 20 & 17.925714\\ \end{array}$	192.168.1.2 192.168.1.2 192.168.1.2 192.168.1.1 192.168.1.1 192.168.1.2 192.168.1.2 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.2 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1	192.168.1.255 192.168.1.255 192.168.1.255 192.168.1.255 192.168.1.255 192.168.1.2 192.168.1.2 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1 192.168.1.1	NBNS Name query NE WORKGROUP-21b> NNS Name query NE WORKGROUP-21b> BROWSEL Local Master Announcement YOUR-23TGBWAAMF, Workstation DNS Standard query A wpcg ARP who has 129.168.1.1 rell 192.168.1.2 ARP 192.168.1.1 is at 00:00:91:03:19:15 DNS Standard query response A 192.168.1.2 TCP 3995 > S080 [SVN] Seq=1 Ack=1 win=6535 Len=0 MSS=1460 TCP 3995 > S080 [ACK] Seq=1 Ack=1 win=65535 Len=0 TCP 3995 > S080 [ACK] Seq=1 Ack=11 win=65535 Len=0 TCP 3995 > S080 [ACK] Seq=1 Ack=11 win=65535 Len=0 TCP 3995 > S080 [ACK] Seq=1 Ack=11 win=65535 Len=0 TCP 3995 > S080 [ACK] Seq=1 Ack=11 win=65535 Len=0 TCP 3995 > S080 [ACK] Seq=1 Ack=119 win=64122 Len=0 TCP 3995 > S080 [ACK] Seq=119 Ack=837 win=65535 Len=131 TCP 5080 > 3995 [PSH, ACK] Seq=87 Ack=250 win=63991 Len=0 TCP 5080 > 3995 [PSH, ACK] Seq=250 Ack=274 win=65535 Len=131 TCP 5080 > 3995 [PSH, ACK] Seq=250 Ack=2749 win=65535 Len=137 TCP 3995 > S080 [ACK] Seq=250 Ack=2749 win=65535 Len=137 TCP 3995 S080 [ACK] Seq=250 Ack=2749 win=65535 Len=137 TCP 5080 > 3995 [ACK] Seq=250 Ack=387 win=63854 Len=0) ;;
 Frame 1 (92 byte: Arrival Time: S Time delta fron Time since reff Frame Number: 1 Packet Length: Dethernet II, Src b Internet Protoco 0000 ff ff ff ff ff fo 83 0000 00 4e 21 f5 (0020 01 ff 00 89 000 00 00 00 000 00 00 00	<pre>s on wire, 92 bytes c iep 21, 2004 11:02:22 n previous packet: 0. rence or first frame 92 bytes 92 bytes 00:10:71:00:56:b9, 1, Src Addr: 192.168. 7 ff 00 10 71 00 55 00 00 80 11 94 58 c0 00 89 01 97 57 80 00 89 04 54 55 50 04 66 64 44 55 50</pre>	aptured) .225546000 000000000 seconds : 0.000000000 second Dst: ff:ff:ff:ff:ff:ff 1.2 (192.168.1.2), 1 	Is :ff Dst Addr: 192.168.1.255 (192.168.1.255) 	
0040 48 48 45 45 5	0 40 40 40 41 43 41	. 45 <u>41454143</u> Hi	UEPTTF AUAUAUAU	

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5-12. Protocol Analysis <H.245> (3/3)

Analysis of Control Protocol for Video Call (H.245 Data)

The additional function offers offline analysis of the log of the H.245 video call control protocol. When a video call test is performed, just the H.245 trace data can be saved in the pcap format used by Ethereal, etc. Combined use with Ethereal supports decoded display of H.245 data.

🔯 Anritsu - MX847010A	🖉 ISDN_P9DCipcap - Ethereal
Eile Setup Simulation Monitor Trace System Help	File Edit View Bo Capture Analyze Statistics Held
🕴 🎟 🏭 📴 C¥MX847010¥Sample Scenario¥W-CDMA¥Test01.dll 🔹 🔹	
No PHY - MAC RLC - TE L3 BTS Primitive Channel Message Time	
364 → HAC DATA_IND U DCCH 1 00:00:48.590	Lipec Sine Sine Sine Sine Sine Sine Sine Sine
366 ← RAC_AT_DATA_IND 0 DCCH 1 RADIO BLARK SELOF CURTEEL 00:00:40:000	No. Time Source Destination Protocol Infr
367 RLC AM DATA REQ D DCCH 2 CC: ALERTING 00:00:48.610	
368 - NAC_DATA_REQ D DCCH 2 00:00:48.610	1 0.0000000 192.163.72.J 192.168.9.46 H.245 TerminalCapabilitySet MasterSI
369 WI PHY DATA PEO D DCH 3 00:00:48.610	2 0.000190 192.163.9.46 192.168.72.3 H.245 TerminalCapabilitySet
370 🗲 Save Setup 00:00:48.650	3 0.999530 192.163.9.45 192.168.72.3 H.245 MasterSlaveJetermination
371 00:00:48.860	4 1.000200 192.163.72.J 192.168.9.46 H.245 TerminalCapabilitySet MasterSl
372 File Type: 00:00:48.860	5 1.999370 192.163.9.46 192.168.72.3 H.245 MasterSlaveDeterminatiorAck
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374 O Text Log OPacket Log	7 1.999330 192.163.9.45 192.168.72.3 H.245 TerminalCapabilitySetAck
wait MMAttac	
send "RRCton The Maine" C. Bocchinents and Settings with Hobozek (CXYPA) follepted _mo	Request ype: 0010 : TerminalCapabilitySet (2)
test count "!" Save Sequence:	¬ TerminalCapabilitySet
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wait 'RRC:Con Sequence All to the s	protocol identifier: J.C.8.245.0.8
wait MM/CM 8 CHOICE CHOICE CHOICE	→ MultiplexCapability
Wait MMAdth Close operations Transport	⇒ MultirlexCapability type: .10, : k223Capability (2)
Send 'RRCSe Stat Sequence No. PD	in proceeding of the second seco
Wait "RRCSec End Sequence: No 8297	
INT INT	
send 'BBC/Rameson comp	0030 ff ff 8a Lc 00 00 03 00 00 8d 02 70 01 06 00 08
wait RLC_AM_DATA_CNF' Message type / MSG	0040 81 75 00 06 53 4C 00 a0 00 a0 00 01 03 e0 01 80 .u50
wait innonatio bears being complete - Patiling indicator/active/it makile chilan direc TLV	0350 UF 80 01 28 03 80 00 0a UC 00 12 50 30 07 00 08CP
send "CC:Connect"	0060 81 75 01 00 00 4C 02 80 01 00 00 08 80 0C 0d .u@
wait 'CC:Connect Acknowledge' S3 07	0070 09 f1 84 28 02 7f 0a 02 00 00 40 0e 08 01 0C 80(@
Mar 2002	Type of Request (γ2 P: 01 D: 01 M: 0

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6. External Control Interface

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MX847010A External Control Interface

Optimum for R&D/UE Verification

- Supports Automatic and Continuous Testing
- The provided DLL library allows external applications to control the MX847010A Control Software. Using this library, external applications can control scenario loading, parameter setting, and simulation execution to support multiple scenarios, repeated testing, and automated test systems.



The Scenario Scheduler application software is bundled with the MD8470A to execute scenarios continuously using the MX847010A Control Software external control function.

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WNS External Control Interface

Optimum for R&D/UE Verification

- Supports Automatic and Continuous Testing
- WNS can be controlled from an external application by calling a WNS function from the MX847010A Control Software external control library (RmtSvcLib.dll).
- Voice, Video, Packet, SMS, MMS and Out-of-Service tests can be executed automatically by calling WNS External Control APIs from the external application.
- The external application can obtain UE registration and bearer establishment status by using the Status Notification function.



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7. Units, Options, Software





Units/Options/Software (1/2)

Main Frame

• MD8470A Signalling Tester

Hardware Options

- MU847010B W-CDMA/HSPA Signalling Unit
- MU847020B GSM Signalling Unit
- MU847090B ISDN Interface Unit
- MD8470A-02 Second RF Option

Software Options

- MX847010A W-CDMA/GSM Simulation Kit
- MX847010A-01 EGPRS Software
- MX847010A-11 HSDPA Software
- MX847010A-12 HSUPA Software
- MX847011A W-CDMA Ciphering Software
- MX847021A GSM/GPRS Ciphering Software

Software Support Contract

• MX847010A-20 MX847010A Support Service (One Year)

Service Options

- MD8470A-90 Extended Three-year Warranty Service
- MD8470A-91 Extended Five-year Warranty Service

Units/Options/Software (2/2)

Examples of Test Configurations

v: Required

Options /Units /Software Configulations	MD8470A	MD8470A-02	MU847010B	MU847010B	MU847020B	MU847020B	MU847090B	MX847010A	MX847010A-01	MX847010A-11	MX847010A-12	MX847010A-20	MX847011A	MX847021A	Remarks
W-CDMA Test Configulation	v		v				*1	v				v	*1		
W-CDMA/HSDPA Test Configulation	v		v				*1	v		v		v	*1		
W-CDMA/HSDPA/HSUPA Test Configulation	v		v				*1	v		v	v	v	*1		
GSM/GPRS Test Configulation	v				v			v				v		*1	
GSM/GPRS/EGPRS Test Configulation	v				v			v	v			v		*1	
W-CDMA/GSWGPRS Test Configulation	v		v		v		*1	v				v	*1	*1	
W-CDMA/HSDPA/HSUPA/GSM/GPRS/EGPRS Test Configulation	v		v		v		*1	v	v	v	v	v	*1	*1	
End to End Test Application Configulation(W-CDMA/W-CDMA) *2	v	v	v	v				v				v			*3, *4
End to End Test Application Configulation (GSM/GSM) *2	v	v			v	v		v				v			*3, *5
End to End Test Application Configulation (W-CDMA/GSM) *2	v	v	v		v			v				v			*3, *6
End to End Test Application Configulation (W/W, G/G. W/G) *2	v	v	v	v	v	v		v				v			*3, *7
InterRAT Test Configulation (W-CDMA<->GSM/GPRS)	v	v	v		v			v				v			*3
InterRAT Test Configulation (W-CDMA/HSDPA<->GSW/GPRS/EGPRS)	v	v	v		v			v	v	v		v			*3

*1: Optional

*2: End to End UE test can be performed in a MD8470A. (CNS: Couple-UE Network Simulator)

*3: Minimum configulation

*4: End to end voice call, video call, SMS and MMS test can be performed (MMS application server is separately required.)

*5: End to end voice call, SMS and MMS test can be performed (MMS application server is separately required.)

*6: End to end SMS and MMS test can be performed (MMS application server is separately required.)

*7: Refer to the above *4, *5, *6 about feasible end to end test.

- Compiling test scenarios requires Microsoft[®] Visual C++[®] .net (Standard 2003) or Microsoft[®] Visual Studio[®] 2005 Standard Edition^{*1}. Also, a USB CD or DVD drive is required to install Visual C++[®] .net (Standard 2003) or Visual Studio[®] 2005 Standard Edition in the MD8470A.
- Order either English or Japanese Windows[®] XP when ordering the MD8470A.

*1: Version 5.00 or higher of the MX847010A W-CDMA/GSM Simulation Kit is required.

*Microsoft Visual C++ and Visual Studio are registered trademarks of Microsoft Corporation in the USA and other countries. *Windows is a registered trademark of Microsoft Corporation in the USA and other countries.

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8. Outline of Support Service

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MX847010A-20: MX847010A Support Service (One Year)

- Basic Policy
 - One-year support contract
- Support Details
 - Responses to enquiries
 - Dedicated mail address for enquiries
 - Software version upgrades for duration of contract (Web download)
 - Maintenance releases (including bug fixes)

Please note this option is mandatory.



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