Product Brochure

Anritsu Advancing beyond

Signalling Tester

MD8430A

Rapid Test Designer (RTD) MX786201A

Early Support for Developing LTE-Advanced Pro (CA/MTC) Chipsets and Mobile UEs

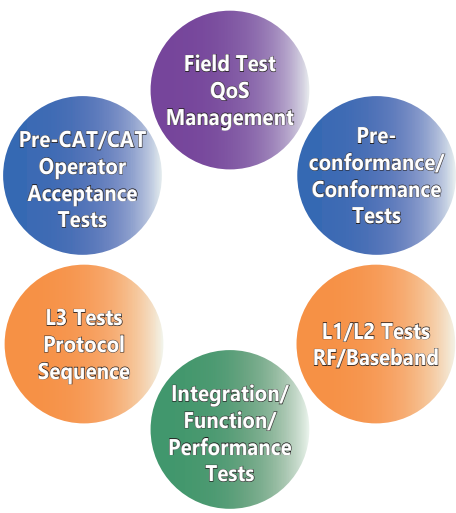
LTE-Advanced Pro is faster than LTE-Advanced and becoming effect radio communications network.
The Signalling Tester MD8430A is a key LTE base station simulator for developing LTE/LTE-Advanced/LTE-Advanced Pro-compliant chipsets and mobile UEs.
Using its extensive experience in 3G markets, Anritsu has developed the MD8430A as a powerful LTE-Advanced Pro protocol R&D test solution to help developers bring LTE/LTE-Advanced/LTE-Advanced Pro terminals to market as fast as possible.

Key Features

- Support LTE-Advanced Pro testing with 6CCs Carrier Aggregation (CA) and less
- Early support 3GPP LTE-Advanced FDD/TDD Release 12
  - TDD-FDD joint operation including CA
  - DL 256QAM
  - LTE MTC (Machine Type Communication)
- One MD8430A support CA handover, 4×4 MIMO, 8×4 MIMO, etc.
- Available to testing of full digital fading
- Support DL 2 Gbps, UL 300 Mbps data throughput
- Inter-RAT tests making effective use of previous MD8480C (UTRAN/GERAN), and MD8475A (CDMA2000) hardware investments
- Optimized investment from first R&D to protocol conformance testing
- Full development and analysis toolset cuts L1, L2 and L3 scenario development time and costs
- Support UMTS Release 10, HSPA Evolution, GSM/GPRS/EGPRS
- Supports 5G NSA protocol testing is possible by using in combination with MT8000A

Main Applications

- Coding/Decoding tests (RF/Baseband)
- Protocol sequence tests
- Throughout and stress tests (Performance test)
- Intra-RAT/Inter-RAT performance tests
- LTE Pre-conformance/Conformance tests
- Network interoperability tests
- LTE network operator acceptance tests (CAT)
- Troubleshooting field test problems
- UE QC inspection
- W-CDMA/HSPA protocol sequence tests



Main Test Functions

- LTE-Advanced Intra-RAT CA handover test (Hard handover)
- LTE ↔ UTRAN/GERAN Inter-RAT handover test
- eMBMS test
- Digital baseband slow clock test
- Protocol sequence analysis (Log analysis)
- Throughput monitoring
- UE Scheduling function (Time/MCS/Lowest RB/RB)
- H-ARQ Test (ACK/NACK/DTX)
- VoLTE test (SPS, TTI Bundling, DRX, RoHC, CA+VoLTE)
- W-CDMA/HSPA handover test
- Dual Connectivity
- Licensed Assisted Access (LAA)
- Cellular Internet of Things (C-IoT) test (Cat-M/NB-IoT)
- NTN NB-IoT (GEO) test

Basic Functions (LTE-Advanced)

- Transmit Downlink (DL) signal (Up to 6 GHz)
- Receive Uplink (UL) signal (Up to 6 GHz)
- Call processing
- Transmit Power Control (TPC)
- Baseband interface
- DL 2×2/4×2 MIMO (Test Model: ETM)
  DL 4×4/8×2/8×4 MIMO (Test Model: ETM)
  UL 2×2 MIMO (Test Model: ETM)
- CA 2CCs/3CCs/4CCs/5CCs/6CCs (Test Model: ETM)
- Ciphering (option)

See page 6 for specifications of MD8430A models.

Supports Newest UE Categories

The MD8430A follows UE categories defined on 3GPP specifications, and will support new future categories.

See page 14; UE category table - Signalling Tester MD8430A Specifications for detail.

MD8430A

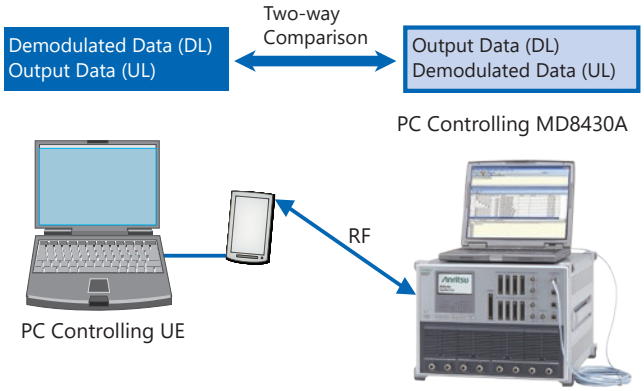
Signalling Tester

Rapid Test Designer (RTD) MX786201A

For Developing LTE-Advanced Pro Chipsets and Mobile UEs RF/Baseband Tests

Coding/Decoding Test

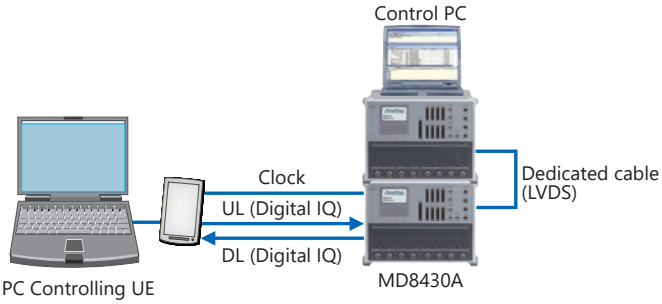
Coding/Decoding tests of LTE-Advanced Pro terminals are performed by making the RF connections shown in the following diagram.



Coding/Decoding Test Example (RF, Non-call-processing Test)

The MD8430A supports digital baseband I/O as standard functions. Using the baseband interface offers high-reproducibility coding/decoding tests free from the RF section, supporting stable evaluation of LTE chipset baseband performance.

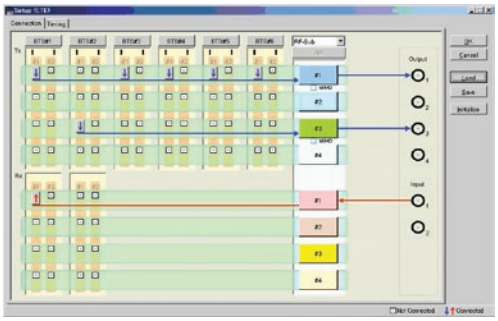
Moreover, LTE coding/decoding tests are supported because the baseband chip can be evaluated using a slower clock than the clock frequency. And connecting the second MD8430A fading function to the digital baseband interface supports slow clock evaluations in a fading environment, which are difficult to perform with an RF fading simulator.



Slow Clock Test Setup (Digital Baseband, Fading)

Easy MIMO Test Configuration Settings

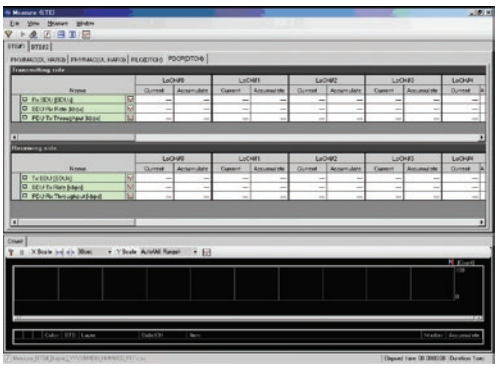
The MD8430A has 8 main and sub RF connectors as well as 8 digital IQ connectors as standard equipment for use with the LTE Control Software MX843010E to easily configure and monitor various settings, including RF parameters, channel power, MIMO, fading, connector selections, frame timing, BTS cell selections, etc.



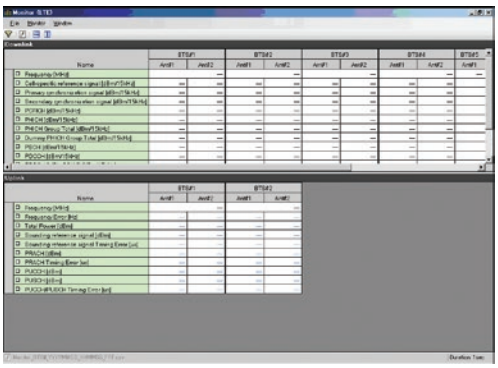
Setup Screen Example

Fully Versatile L1/L2 Monitoring Functions

The MX843010E software supports LTE development by processing large volumes of low-layer data at very high speeds using a full line of versatile power monitoring, throughput monitoring and log analysis functions. The Measure (Counter) functions can monitor Layer 1/2 (L1/L2) throughputs in real time by counting parameter values such as ACK/NACK/DTX/CQI.



Measurement (Counter and Throughput) Screens



Monitor Screen Example

Signalling Tester MD8430A Features

L3 Tests Protocol Sequence

Complete LTE-Advanced Pro Protocol Test Environment

Intelligent Test Creation

The Rapid Test Designer (RTD) MX800050A/MX786201A software tools gives users power to create tests that cannot be done with traditional language based tools. RTD Supports L1/L2/L3 testing using Lower Layer Configuration library and Layer 3 procedure library of UE development.

Moreover, each procedure auto-sets the connection with the lower Layers (L1/L2) based on full compliance with the 3GPP standards.

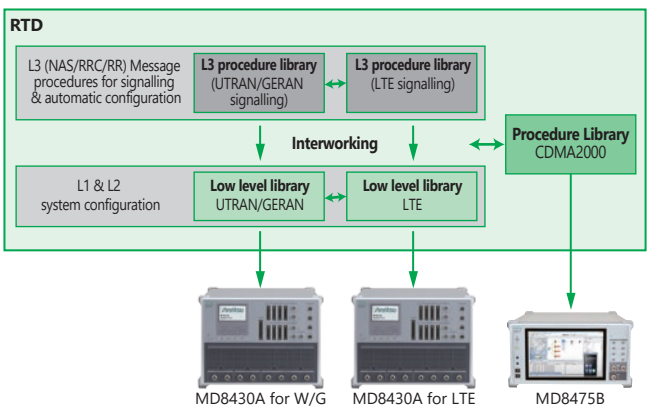
RTD can simulater LTE ↔ UMTS Inter-RAT and LTE ↔ CDMA2000 Interworking by connecting MD8430A and/or MD8475B.

The Reference Library test cases provides a reference to build the customized test cases and libraries with ease.

Cuts Test Case Development Time

The RTD GUI offers intuitive test case creation by linking procedures with parameters, such as network conditions and message data, at easy-to-understand setting screens, quickly increasing the number of working test cases.

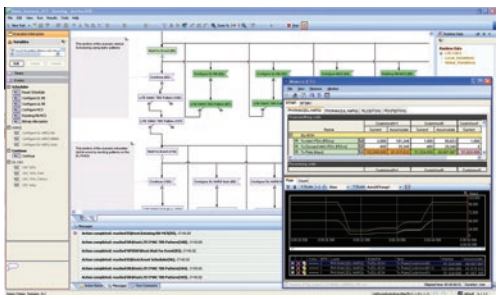
In addition, the Built-in Analyzer function checks for programming errors prior to testing, which can start immediately without recompiling after editing and changing settings.



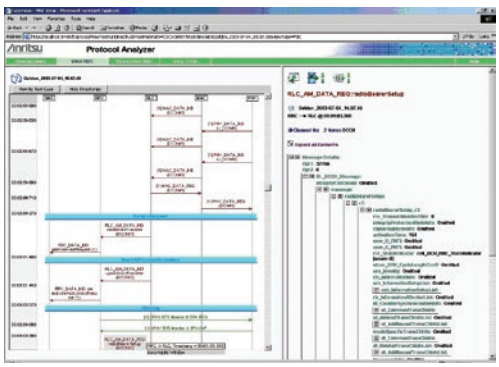
RTD Procedure Block

Flexibility in Testing & Analysis

When the test finishes the execution, the RTD provides a preliminary judgment against predetermined criteria. This avoids the need to study complex message sequences and can show a test outcome explained in a local language. The Integrated protocol analyzer with RTD supports very detailed Message Sequence Analysis and provides a facility to export the Protocol Test logs in to HTML format which can be viewed at any PC with a Browser without a RTD license.



Test Execution Screen (RTD)



Log Analysis Screen (RTD)

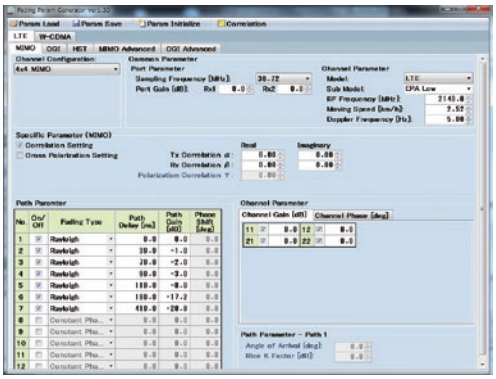
Efficient UE Integration and Performance Tests

Testing Throughput for Various Conditions

The MD8430A supports the latest UE categories with download speeds of 2 Gbps and uploads speeds of 300 Mbps.

The bundled sample scenarios make it easy to change parameters such as bandwidth, scheduling, HARQ, etc., for testing LTE throughputs under various conditions.

In addition, combination with second MD8430A fading function supporting LTE MIMO via the dedicated digital interface simplifies complex power control procedures for easy throughput testing in a fading environment with simple test setup.

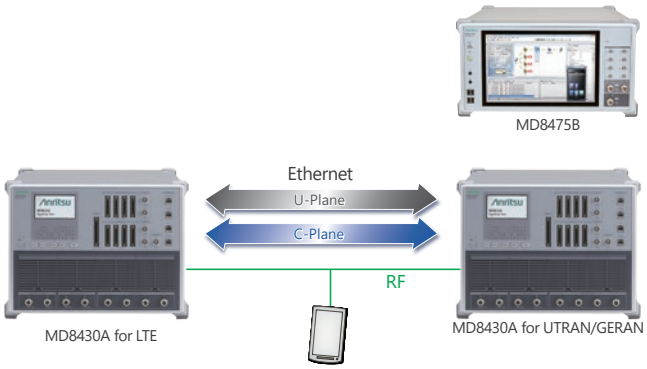


Fading Setting Screen (MF6900A Fading Simulator)

Handover Tests Optimizing Hardware Investment

The MD8430A supports up to six cells (Four active cells) allowing handover tests between two LTE BTS with one tester. In addition, LTE-UTRAN/GERAN Inter-RAT handover tests are supported by connecting 2boxes of MD8430A.

With the Signalling Tester MD8475B, CDMA2000 Interworking tests are supported too, maximizing support for both worldwide communications technologies and investment in hardware.



LTE-UTRAN/GERAN Handover Test Setup

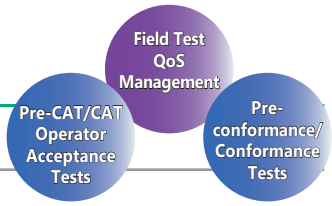
Specifications of Signalling Tester MD8430A Model (ETM)

Model/Name	MD8430A-035 LTE Enhanced Test Model (ETM)
Interface	RF, Digital IQ, Baseband Fading*1
Frequency Band	Max. 20 MHz
UE Category	Category 1, 2, 3, 4, 5, 6, 7, 9*2, 10*2, 11*2, 12*2 DL Category M1, 0, 1 bis, 4, 6, 7, 9*2, 10*2, 11*2, 12*2, 13*2, 15*2, 16*2, 18*2, 19*2, 20*2 UL Category M1, 0, 1 bis, 3, 5, 7, 13, 15, 20 NB Category NB1
Max. Data Rate (DL)	1 Gbps (PHY: 2 Gbps)
Max. Data Rate (UL)	300 Mbps
MIMO	2 × 2 MIMO 4 × 2 MIMO 4 × 4 MIMO*3 8 × 2 MIMO 8 × 4 MIMO*4
Max. No. of Base Station	Active + adjacent BTS: 8*5 (Max. Active BTS: 6)
Hard Handover (including at MIMO)	Available*6
Carrier Aggregation: No. of Component Carriers (DL)*7	6*8, *9, *10
Carrier Aggregation: No. of Component Carriers (UL)*7	3*11

*1: Requires MD8430A-067 and two MD8430A sets for Baseband Fading. (ETM & ETM or ETM & BTM)
*2: Requires two MD8430A sets. (ETM & ETM or ETM & BTM)
*3: Requires MD8430A-075.
*4: Requires MD8430A-076.
*5: Requires two MD8430A sets. (ETM & ETM)
*6: For inter-frequency handover with Carrier Aggregation, requires two MD8430A sets. (ETM & ETM or ETM & BTM)
*7: Requires MD8430A-085.
*8: DL 4 CA operation requires MD8430A-088, DL 5 CA operation requires MD8430A-089, and DL 6 CA operation requires MD8430A-044.
*9: For 3 CA MIMO and 4 CA MIMO, requires two MD8430A sets. (ETM & ETM or ETM & BTM)
*10: For DL 5 CA MIMO and 6 CA MIMO, requires two MD8430A sets (only ETM 2 sets configuration)
*11: UL 3 CA operation requires MD8430A-045.

Signalling Tester MD8430A Features

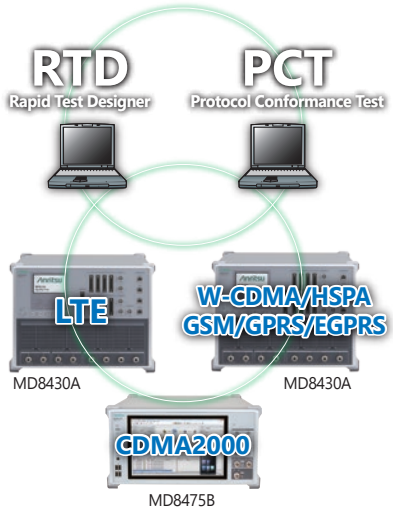
Powerful Platform for Both Conformance and Operator Acceptance Tests



Optimized Hardware Investment

The MD8430A supports to design for early chipset and mobile UE, function tests, and performance tests ranging from carrier acceptance tests to protocol conformance tests as well as retrofit upgrades between models allows developers to tailor their hardware investment to current needs with future flexible upgrade options.

The Protocol Conformance Test Toolkit (PCT) with MD8430A and GCF/PTCRB approved TTCN test package provide an optimum environment for LTE protocol conformance testing. Hence, a Single Hardware Platform that extends its usage from Platform development to Conformance Testing and Operator Acceptance Test.



Full Line of Versatile L3 Analysis Tools

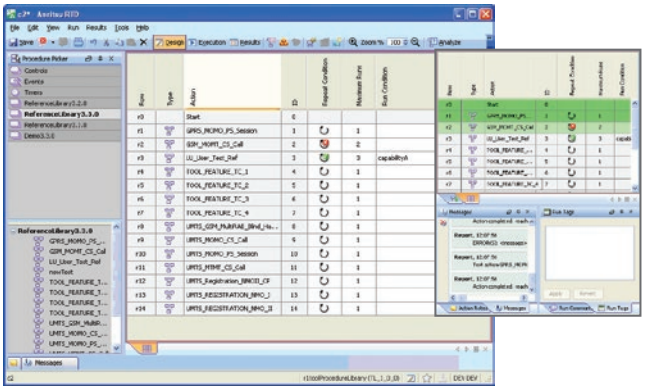
Used as a component for test system

Instant Firmware Switching

Because the MD8430A saves up to ten firmware versions, the right firmware is selected easily at startup. There is no need to install/uninstall firmware when executing a test case that determines the firmware version.

Powerful Automated Testing

The RTD software supporting the UE control interface makes it easy to setup automated test systems. Furthermore, multiple test cases can be executed continuously and test reports generated automatically, and many functions, including repeat testing under different conditions with multiple settings, can be automated, offering carriers, etc., an ideal turnkey solution for acceptance testing.



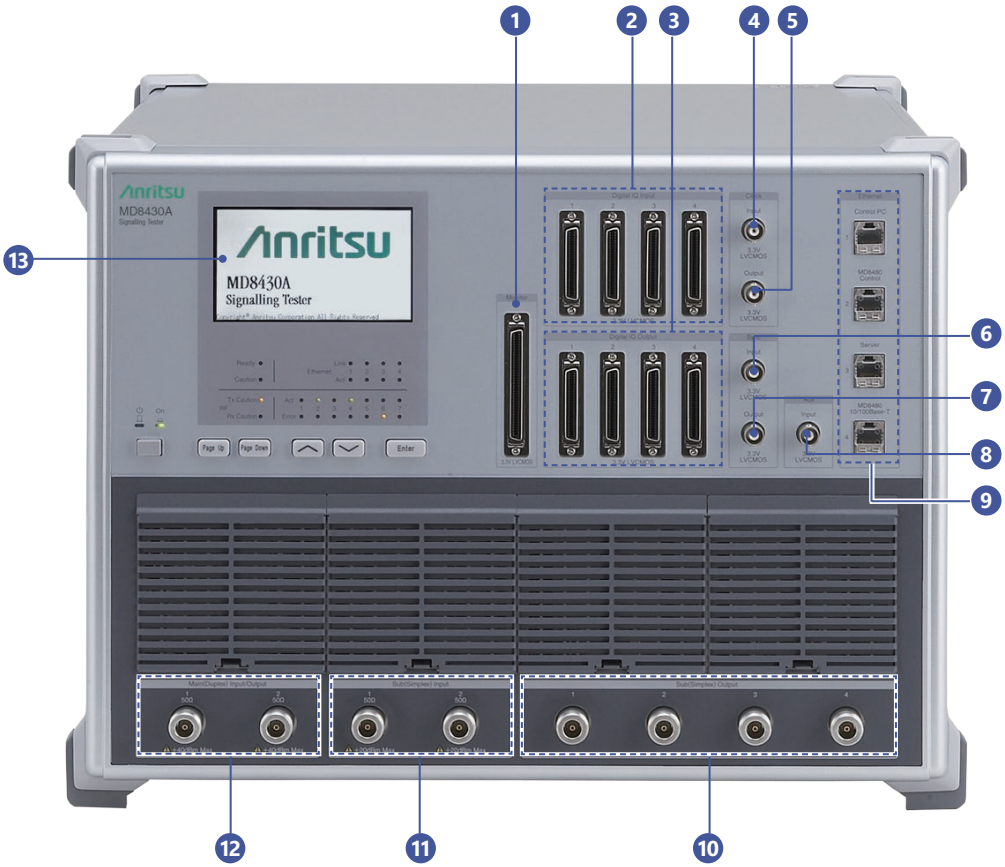
Example of Test Case Campaign

Easy Test Case Maintenance

Test cases created by the RTD software can be updated easily when new 3GPP standard evolves, reducing the need for re-editing. In addition, guaranteed test case compatibility even when the MD8430A firmware version is changed removes the need to recompile, etc., resulting in greatly reduced costs for maintaining test cases to support regression testing when rolling out new terminals and performing pre-IOT to assure compatibility with network equipment worldwide.

Signalling Tester MD8430A Panel Layout

Front Panel



1 Monitor
Connector outputting signal internal data and status to accessory Monitor Board

2 Digital IQ Input
Connector for inputting digital IQ signal

3 Digital IQ Output
Connector for outputting digital IQ signal

4 Clock Input
BNC connector for inputting system clock to operate using external clock

5 Clock Output
BNC Connector for outputting system clock

6 Sync Input
BNC Connector for inputting and operating using external sync signal

7 Sync Output
BNC Connector for outputting sync signal

8 Aux Input
BNC Input connector reserved for adding future functions

9 Ethernet
(1) Ethernet connector for connecting external PC controller
(2) Ethernet connector to control MD8480C, connecting with 'Control PC' connector on MD8480C
(3) Ethernet connector for server
(4) Ethernet connector for connecting MD8480C using '10/100BASE-T' connector

10 Sub (Simplex) Output
N connector for RF output

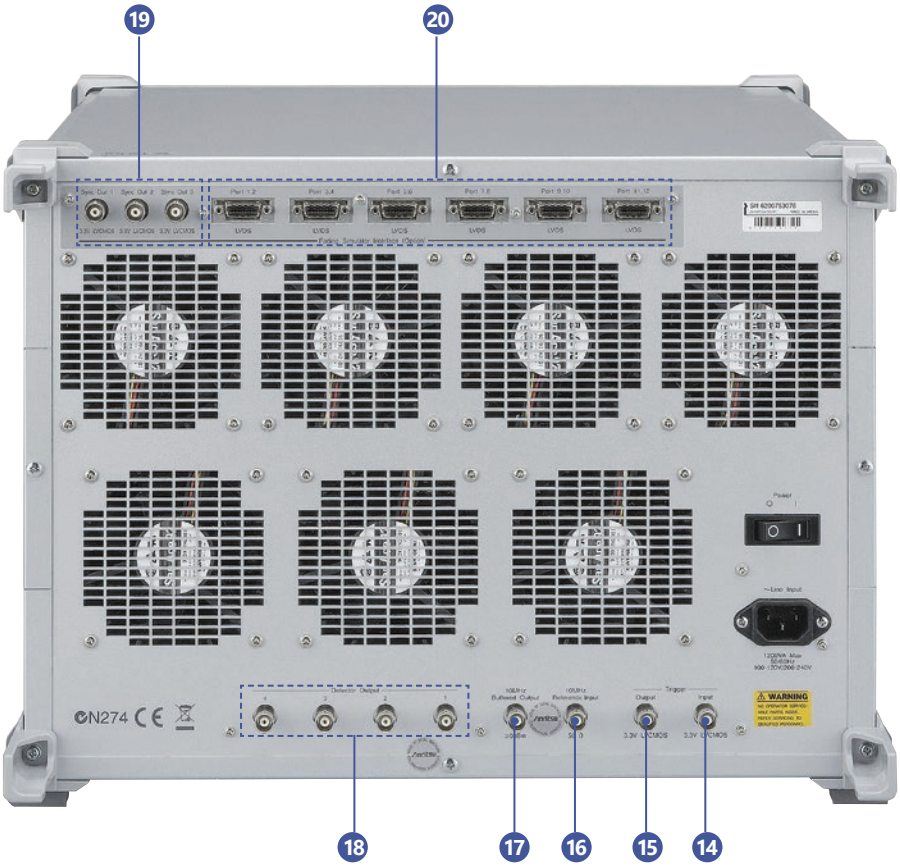
11 Sub (Simplex) Input
N connector for RF input

12 Main (Duplex) Input/Output
N connector for RF input/output

13 LCD
Screen displaying equipment information such as firmware selection and maintenance software screens

Signalling Tester MD8430A Panel Layout

Rear Panel



14 Trigger Input
BNC Connector for inputting a trigger signal from external equipment

15 Trigger Output
BNC Connector for outputting event timing to external equipment

16 10 MHz Reference Input
BNC Connector for inputting external reference signal

17 10 MHz Buffered Output
BNC Connector for outputting equipment reference signal

18 Detector Output
BNC Connector for outputting profile signal of RF signal power

19 Sync Out
BNC Connector for outputting sync signal to Fading Simulator

20 LVDS
Connector for connecting Fading Simulator using Digital IQ

Signalling Tester MD8430A Configurations

Test Models/Options/Software

Test Models

Basic Test Model (BTM)	**MD8430A-025**
M2M Test Model (MTM)	**MD8430A-027**
LTE Enhanced Test Model (ETM)	**MD8430A-035**

Choose one of the above three models.

Test Model Upgrade

Required option when upgrading to higher order model.

Upgrade from Function Test Model (FTM)

LTE FTM to ETM Upgrade Kit	Z1670A
LTE FTM to ETM Upgrade Kit (FO)	Z1789A

Upgrade from Standard Test Model (STM)

LTE STM to ETM Upgrade Kit	Z1671A
LTE STM to ETM Upgrade Kit (FO)	Z1790A

Upgrade from Performance Test Model (STM)

LTE PTM to ETM Upgrade Kit	Z1672A
LTE PTM to ETM Upgrade Kit (FO)	Z1791A

Upgrade from Basic Test Model

LTE BTM to ETM Upgrade Kit	Z1873A
LTE BTM to MTM Upgrade Kit	Z1976A

Upgrade from M2M Test Model

LTE MTM to ETM Upgrade Kit	Z1977A

Options

Extended Frequency Range to 3.8 GHz MD8430A-002
Required software option when extending maximum frequency of MD8430A (Tx/Rx) to 3.8 GHz.

Enhanced DL Frequency Bandwidth Option MD8430A-004
Required software option when extending downlink frequency bandwidth of MD8430A (Tx) to 60 MHz.

Extended Frequency Range to 3.8 GHz Hardware 2 MD8430A-005
Required hardware option when extending maximum frequency of MD8430A (Tx/Rx) to 3.8 GHz. (Test Model: BTM, ETM)

Extended Frequency Range to 6 GHz MD8430A-006
Required software option when extending maximum frequency of MD8430A (Tx/Rx) to 6 GHz.

Extended Frequency Range to 6 GHz Hardware MD8430A-007
Required hardware option when extending maximum frequency of MD8430A (Tx/Rx) to 6 GHz.

LTE DL 6 Carrier Aggregation Option MD8430A-044
Option for adding Carrier Aggregation (CA) function supporting transmission of up to six component carriers on downlink.

LTE UL 3 Carrier Aggregation Option MD8430A-045
Option for adding Carrier Aggregation (CA) function supporting reception of up to three component carriers on uplink.

NB-IoT NTN MD8430A-047
Required software option for executing NB-IoT NTN (GEO/GSO/NGSO) function.

W-CDMA Fading Option MD8430A-052
Required software option when W-CDMA fading testing.

SCME Fading Option MD8430A-053
Required software option when SCME fading testing.

LTE 2 × 2 MIMO Fading Option MD8430A-055
Required software option when LTE 2×2 MIMO fading testing.

LTE 4 × 2 MIMO Fading Option MD8430A-056
Required software option when LTE 4×2 MIMO fading testing.

LTE 4 × 4 MIMO Fading Option MD8430A-057
Required software option when LTE 4×4 MIMO fading testing.

LTE 8 × 2 MIMO Fading Option MD8430A-058
Required software option when LTE 8×2 MIMO fading testing.

LTE 8 × 4 MIMO Fading Option MD8430A-059
Required software option when LTE 8×4 MIMO fading testing.

LTE FDD Option MD8430A-060
Required option when simulating 3GPP LTE FDD.

LTE TDD Option MD8430A-061
Required option when simulating TD-LTE.

LTE Enhanced MTC Option MD8430A-062
Required option when simulating LTE eMTC.

Narrow Band IoT Option MD8430A-063
Required option when simulating NB-IoT.

LTE Anchor For 5G NSA Option MD8430A-064
Software option for Protocol tests and IP evaluations using the 5G NSA in coordination with the MT8000A.

W-CDMA Option MD8430A-065
Required option when simulating W-CDMA.

GSM Option MD8430A-066
Required option when simulating GSM.

RF/Fading Driver Option MD8430A-067
Required software option when extending RF for MD8430A-025 BTM and executing the fading function (MD8430A-055, 056, 057, 058)

HSPA Multi Carrier Option MD8430A-070
Required option when HSPA multi carrier testing.

W-CDMA/GSM Ciphering Option MD8430A-071
Option for adding ciphering function for W-CDMA, GSM and GPRS. Supporting KASUMI and SNOW 3G to W-CDMA. A5/1, A5/2, A5/3 and A5/4 to GSM. GEA1, GEA2, GEA3 and GEA4 to GPRS.

LTE Licensed Assisted Access (LAA) Option MD8430A-072
Required software option for executing LTE Licensed Assisted Access function.

LTE Dual Connectivity Option MD8430A-073
Required software option for executing Dual Connectivity function.

LTE DL 4 × 4 MIMO Option MD8430A-075
Required software option when LTE 4×4 MIMO testing.

LTE DL 8 × 4 MIMO Option MD8430A-076
Required software option when LTE 8×4 MIMO testing.

LTE Internal Server Option MD8430A-077
Required option for IP data communications using the built-in server. IP Data Throughput tests up to 1.6 Gbps are supported.

LTE UL 2 × 2 MIMO Option MD8430A-078
Required software option when LTE UL 2×2 MIMO testing.

LTE UL 256QAM Option MD8430A-079
Required software option when LTE UL 256QAM testing.

LTE Ciphering Option MD8430A-080
Option for adding ciphering function supporting EEA0, EEA1, and EEA2 (TS 33.401, TS 36.323) algorithms to LTE.

LTE ROHC Option MD8430A-081
Option for adding LTE ROHC function supporting RTP/UDP/IP (RFC 3095, RFC 4815), UDP/IP (RFC 3095, RFC 4815), ESP/IP (RFC 3095, RFC 4815), and IP (RFC 3843, RFC 4815).
Required this option for VoLTE testing.

LTE MBMS Option MD8430A-082
Option for adding LTE MBMS function supporting (P) MCH Transmission Scheduling, MCCH Message Transmission, MSI MAC control element Transmission and MTCH Message Transmission described in 3GPP (TS 36.211, TS36.221).

Test Models/Options/Software (Cont'd)

LTE ZUC Ciphering Option MD8430A-083
Option for adding ciphering function supporting EEA3 and EIA3 (TS 33.401, TS 35.221) algorithms to LTE.

LTE Carrier Aggregation Option MD8430A-085
Option for adding Carrier Aggregation (CA) function supporting transmission of up to two component carriers on downlink.

Ciphering Option MD8430A-086
Option for adding ciphering function supporting EEA0, EEA1, EEA2, EEA3 and EIA3 (TS 33.401, TS 35.221, TS 36.323) algorithms to LTE.

LTE CoMP Option MD8430A-087
Required software option when 3GPP Release 11 CoMP feature. It is available to test Dynamic Point Selection.

LTE DL 4 Carrier Aggregation Option MD8430A-088
Option for adding Carrier Aggregation (CA) function supporting transmission of up to four component carriers on downlink.

LTE DL 5 Carrier Aggregation Option MD8430A-089
Option for adding Carrier Aggregation (CA) function supporting transmission of up to five component carriers on downlink.

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

Software

LTE Control Software MX843010E
Software for simulating L1 and L2 with test cases in C.
(Test Model: ETM)

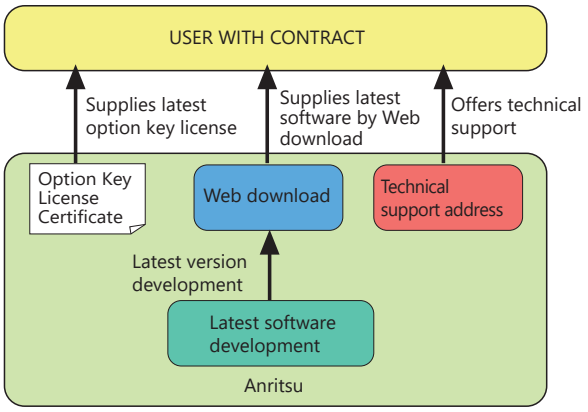
W-CDMA/GSM Control Software MX843070E
Software for simulating L1 and L2 with test cases in C.
(Test Model: W-CDMA/GSM)

Rapid Test Designer (RTD) MX800050A/MX786201A
Software for simulating L1 to L3 with test cases described by GUI for automating testing, analyzing test cases and creating reports.

Software Maintenance Contract

Service PrAovided
- Contract for adding/revising software functions in line with 3GPP revisions
- Technical support for troubleshooting user problems

Annual Support Service (1 year)
Option providing 1 year of service support for MD8430A test functions including web downloads of latest software and technical enquiries. Services depend on option configuration.



MD8430A Support Services

MD8430A Support (FDD)	
1 Year Support Service LTE FDD (ETM)	MD8430A-SS135
MD8430A Support (TDD)	
1 Year Support Service LTE TDD (ETM)	MD8430A-SS136
MD8430A Support (NB-IoT NTN)	
1 Year Support Service for NB-IoT NTN (GEO/GSO/NGSO)	MD8430A-SS147
MD8430A Support (W-CDMA/GSM)	
1 Year Support Service W-CDMA/GSM	MD8430A-SS170
MD8430A Support (LTE eMTC)	
1 Year Support Service for LTE eMTC	MD8430A-SS171
MD8430A Support (NB-IoT)	
1 Year Support Service for NB-IoT	MD8430A-SS172
LTE Control Software Support MX843010E	
1 Year Support Service (Test Model: ETM)	MX843010E-SS120

Reference Oscillator	Reference Frequency	10 MHz
	Activation Characteristics	±5 × 10^{-7} (2 minutes after turning on the power) ±5 × 10^{-8} (5 minutes after turning on the power) At 25°C, Based on the frequency 24 hours after turning on the power
	Aging Rate	±1 × 10^{-8}/day (Specification per day, based on the frequency 48 hours after turning on the power) ±1 × 10^{-7}/year (Specification per day, based on the frequency 10 days after turning on the power)
	Temperature Characteristics	±2 × 10^{-8} (0°C to 45°C) Based on the frequency at 25°C
	External Reference Input	Frequency: 10 MHz Operating range: ±1 ppm Input level: –15 dBm ≤ level ≤ +20 dBm (50Ω, AC coupling) Connector: BNC-J, 50Ω (nominal)
	Internal Reference Output	Frequency adjusted at shipment: 10 MHz ±0.02 ppm Output level: ≥0 dBm (50Ω, AC coupling) Connector: BNC-J, 50Ω (nominal)
Transmission Signal	Maximum Output Level	Main connector: –40 dBm (Maximum setting level at Main connector: –20 dBm) Sub connector: 0 dBm
	Level Accuracy	±1.5 dB (350 MHz ≤ Frequency ≤ 3800 MHz) ±2.0 dB (3800 MHz < Frequency ≤ 6000 MHz) Main connector: –113 dBm ≤ Level ≤ –40 dBm Sub connector: –113 dBm ≤ Level ≤ 0 dBm After calibration, 18°C to 28°C, for calibration CW
	Frequency	LTE: 350 MHz to 3.0 GHz, 350 MHz to 3.8 GHz (with MD8430A-002), 350 MHz to 6.0 GHz (with MD8430A-006) W-CDMA: 400 MHz to 3.0 GHz, 400 MHz to 3.8 GHz (with MD8430A-002/006) GSM: 400 MHz to 2.0 GHz Setting resolution: 100 kHz
	Access Method	LTE: OFDMA, W-CDMA: CDMA, GSM: TDMA
	Modulation Method	LTE: QPSK, 16QAM, 64QAM, 256QAM W-CDMA: QPSK, 16QAM, 64QAM GSM: GMSK, 8PSK
	Modulation Accuracy	LTE: ≤2%, Sub output: 0 dBm, LTE (OFDM, 64QAM, 20 MHz band) W-CDMA: ≤3.5%, Sub output: 0 dBm, W-CDMA (transmitting CPICH, ICH) GSM: ≤1.5deg., Sub output: 0 dBm, GMSK ≤3.5%, Sub output: 0 dBm, 8PSK * At 18°C to 28°C
Received Signal	Input Level	Setting demodulation range Based on the value set for the reference power QPSK: –28 to +15 dB 16QAM: –21 to +15 dB 64QAM: –15 to +15 dB (Input signal: EVM ≤1%, BER ≤1 × 10^{-12}, 20 MHz band, SC-FDMA) Main connector input: Reference Power setting range: −20 to +20 dBm However, within the input level range from −30 to +35 dBm Sub connector input: Reference power setting range: –35 to +5 dBm However, within the input level range from −45 to +20 dBm
	Level Accuracy	Main connector: ±3.0 dB Sub connector: ±3.0 dB At 18°C to 28°C, for calibration CW, within the Main input level range from −30 to +35 dBm, the Sub input level range from −45 to +20 dBm, and the reference power range of ±15 dB
	Frequency	LTE: 350 MHz to 3.0 GHz, 350 MHz to 3.8 GHz (with MD8430A-002), 350 MHz to 6.0 GHz (with MD8430A-006) W-CDMA: 400 MHz to 3.0 GHz, 400 MHz to 3.8 GHz (with MD8430A-002/006) GSM: 400 MHz to 2.0 GHz (setting resolution: 100 kHz)
	Access Method	LTE: SC-FDMA, W-CDMA: CDMA, GSM: TDMA
	Modulation Method	LTE: QPSK, 16QAM, 64QAM, 256QAM W-CDMA: BPSK, 4PAM GSM: GMSK, 8PSK
	Synchronization Acquirable Range	LTE: ±100 µs (PRACH), ±30 µs (PUSCH) W-CDMA: ±100 chips (PRACH), ±100 chips (DPCCH) GSM: 0 to 63 symbols (SACCH)

Signalling Tester MD8430A Specifications

RF Connector	Main	Connector: N-J, 50Ω (nom.) VSWR: ≤1.3 (Frequency Range: ≥350 MHz to ≤3800 MHz) ≤1.4 (Frequency Range: >3800 MHz to ≤6000 MHz)
	Sub (Downlink)	Connector: N-J, 50Ω (nom.) VSWR: ≤1.5 (Frequency Range: ≥350 MHz to ≤3800 MHz) ≤1.6 (Frequency Range: >3800 MHz to ≤6000 MHz)
	Sub (Uplink)	Connector: N-J, 50Ω (nom.) VSWR: ≤1.5 (Frequency Range: ≥350 MHz to ≤3800 MHz) ≤1.6 (Frequency Range: >3800 MHz to ≤6000 MHz)
Front Panel Interface	Digital IQ I/F	DX20 connector (50 pin) × 8 Digital IQ signal, IQ: 16 bit
	Monitor I/F	DX20 connector (80 pin), 3.3 V-CMOS level Connection with the Monitor board (G0091)
	Sync Out	BNC connector, 3.3 V-CMOS level Internal Sync Start signal output
	Sync In	BNC connector, 3.3 V-CMOS level External Sync Start signal input
	Clock Out	BNC connector, 3.3 V-CMOS level Internal Clock signal output
	Clock In	BNC connector, 3.3 V-CMOS level, 10 kHz to 30.72 MHz External Clock signal input
MF6900A Interface	Sync Out	Without MD8430A-008/108/208: BNC connector × 3, 3.3 V-CMOS level With MD8430A-008/108/208: BNC connector × 2, 3.3 V-CMOS level Connection with the MF6900A (Sync Start signal)
	Port	Without MD8430A-008/108/208: HIB-B16LFYGA connector × 6, LVDS level With MD8430A-008/108/208: HIB-B16LFYGA connector × 2 (Digital IQ: 2ports/connector), LVDS level HIB-B16LFYGA connector × 4 (Digital IQ: 8ports/connector), LVDS level Connection with the MF6900A (Digital IQ signal)
CE	EMC	2014/30/EU, EN61326-1, EN61000-3-2
	LVD	2014/35/EU, EN61010-1
	RoHS	2011/65/EU, (EU) 2015/863, EN IEC 63000: 2018
UKCA	EMC	S.I. 2016 No.1091, EN 61326-1, EN61000-3-2
	LVD	S.I. 2016 No.1101, EN 61010-1
	RoHS	S.I. 2012 No.3032, EN IEC 63000: 2018
Temperature	Operating	0°C to +45°C, ≤90% RH (no condensation) 0°C to +40°C, ≤90% RH (no condensation) (with Enhanced Hardware)
	Storage	–20°C to +60°C, ≤85% RH (no condensation)
Power Supply	Voltage	100 VAC to 120 VAC/200 VAC to 240 VAC (Automatic switching system)
	Frequency	50 Hz/60 Hz (Automatically changeover system)
	Power Consumption	≤1200 VA
Dimensions and Mass	Dimensions	426 (W) × 310 (H) × 500 (D) mm
	Mass	≤40 kg

UE category table: 3GPP TS 36.306 V14.5.0 (2017-12)

: MD8430A supported : MD8430A not supported

UE Category (DL)

UE 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 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

UE Category (UL)

UE 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 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

UE DL 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		12789504	
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]
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) 201936 (4 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]

UE UL 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

NB-IoT (DL)

UE 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
Category NB1	680	680	2112
Category NB2	2536	2536	6400

NB-IoT (UL)

UE 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
Category NB1	1000	1000
Category NB2	2536	2536

Signalling Tester MD8430A Ordering Information

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

Model/Order No.	Name
	LTE Basic Test Model
MD8430A	Signalling Tester
MD8430A-005	Extended Frequency Range to 3.8 GHz Hardware 2
MD8430A-025	Basic Test Model (BTM)
	M2M Test Model
MD8430A	Signalling Tester
MD8430A-005	Extended Frequency Range to 3.8 GHz Hardware 2
MD8430A-027	M2M Test Model (MTM)
	LTE Enhanced Test Model
MD8430A	Signalling Tester
MD8430A-005	Extended Frequency Range to 3.8 GHz Hardware 2
MD8430A-035	LTE Enhanced Test Model (ETM)
	Standard Accessories
	CD-ROM
	(Operation Manual and Maintenance Software): 1 pc
J1440A	LAN Cable: 2 pcs
J1211	Power Cord, 3.0 m (15 A): 1 pc
J0127A	Coaxial Cord, 1.0 m (BNC-P · RG58A/U · BNC-P): 1 pc
J0576B	Coaxial Cord, 1.0 m (N-P · 5D-2W · N-P): 2 pcs
J1398A	N-SMA Adaptor: 6 units
J1459A	Digital IQ Cable (50 cm): 1 pc
	Options
MD8430A-002	Extended Frequency Range to 3.8 GHz
MD8430A-004	Enhanced DL Frequency Bandwidth Option
MD8430A-006	Extended Frequency Range to 6 GHz
MD8430A-007	Extended Frequency Range to 6 GHz Hardware
MD8430A-044	LTE DL 6 Carrier Aggregation Option
MD8430A-045	LTE UL 3 Carrier Aggregation Option
MD8430A-047	NB-IoT NTN
MD8430A-052	W-CDMA Fading Option
MD8430A-053	SCME Fading Option
MD8430A-055	LTE 2×2 MIMO Fading Option
MD8430A-056	LTE 4×2 MIMO Fading Option
MD8430A-057	LTE 4×4 MIMO Fading Option
MD8430A-058	LTE 8×2 MIMO Fading Option
MD8430A-059	LTE 8×4 MIMO Fading Option
MD8430A-060	LTE FDD Option
MD8430A-061	LTE TDD Option
MD8430A-062	LTE Enhanced MTC Option
MD8430A-063	Narrow Band IoT Option
MD8430A-064	LTE Anchor For 5G NSA Option
MD8430A-065	W-CDMA Option
MD8430A-066	GSM Option
MD8430A-067	RF/Fading Driver Option
MD8430A-070	HSPA Multi Carrier Option
MD8430A-071	W-CDMA/GSM Ciphering Option
MD8430A-072	LTE Licensed Assisted Access (LAA) Option
MD8430A-073	LTE Dual Connectivity Option
MD8430A-075	LTE DL 4×4 MIMO Option
MD8430A-076	LTE DL 8×4 MIMO Option
MD8430A-077	LTE Internal Server Option
MD8430A-078	LTE UL 2×2 MIMO Option
MD8430A-079	LTE UL 256QAM Option
MD8430A-080	LTE Ciphering Option
MD8430A-081	LTE ROHC Option
MD8430A-082	LTE MBMS Option
MD8430A-083	LTE ZUC Ciphering Option
MD8430A-085	LTE Carrier Aggregation Option
MD8430A-086	Ciphering Option
MD8430A-087	LTE CoMP Option
MD8430A-088	LTE DL 4 Carrier Aggregation Option
MD8430A-089	LTE DL 5 Carrier Aggregation Option
MD8430A-103	Extended Frequency Range to 3.8 GHz Hardware Retrofit (for Asia, Oceania)
MD8430A-107	Extended Frequency Range 3 GHz to 6 GHz Hardware Retrofit (for Asia, Oceania)
MD8430A-117	Extended Frequency Range 3.8 GHz to 6 GHz Hardware Retrofit (for Asia, Oceania)
MD8430A-203	Extended Frequency Range to 3.8 GHz Hardware Retrofit (FO)
MD8430A-207	Extended Frequency Range 3 GHz to 6 GHz Hardware Retrofit (FO)
MD8430A-217	Extended Frequency Range 3.8 GHz to 6 GHz Hardware Retrofit (FO)

Model/Order No.	Name
	Software Options
MX843010E	LTE Control Software
MX843070E	W-CDMA/GSM Control Software
MX786201A	Rapid Test Designer (RTD)
MX800050A	Rapid Test Designer Platform (RTD)
	Main frame Support Service
	[FDD]
MD8430A-SS125	1 Year Support Service for LTE FDD (BTM)
MD8430A-SS135	1 Year Support Service for LTE FDD (ETM)
	[TDD]
MD8430A-SS126	1 Year Support Service for LTE TDD (BTM)
MD8430A-SS136	1 Year Support Service for LTE TDD (ETM)
	[W-CDMA/GSM]
MD8430A-SS170	1 Year Support Service for W-CDMA/GSM
	[LTE eMTC]
MD8430A-SS171	1 Year Support Service for LTE eMTC
	[NB-IoT]
MD8430A-SS147	1 Year Support Service for NB-IoT NTN
MD8430A-SS172	1 Year Support Service for NB-IoT
	LTE Control Software Support Service
MX843010E-SS120	1 Year Support Service
	Upgrade Options
Z1670A	LTE FTM to ETM Upgrade Kit
Z1789A	LTE FTM to ETM Upgrade Kit (FO)
Z1671A	LTE STM to ETM Upgrade Kit
Z1790A	LTE STM to ETM Upgrade Kit (FO)
Z1672A	LTE PTM to ETM Upgrade Kit
Z1791A	LTE PTM to ETM Upgrade Kit (FO)
Z1873A	LTE BTM to ETM Upgrade Kit
Z1976A	LTE BTM to MTM Upgrade Kit
Z1977A	LTE MTM to ETM Upgrade Kit
	Application Products
MN8150A	RF Combiner Unit
G0091	Monitor Board
J1005	Monitor Cable 80
J1416A	LVDS CABLE
J1609A	Signal Divider

*: A PC*1 running Microsoft Visual C++ 2010 Express Edition or Microsoft Visual Studio Express 2015 is required to use the MD8430A.
It must be supplied by the customer.

*1: The PC controller for the MD8430A must meet or exceed the following specifications:
OS: Windows 10 Pro (64 bit) or later
CPU: Intel Core i7-6700 3.4 GHz or more
RAM: 8 GB or more
NIC: 1000 BASE-T

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Specifications are subject to change without notice.

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