Signalling Tester
MD8475A
Test Solutions throughout Development Cycle

- Smartphone Integration and Verification
- Chipset/Protocol Verification
- RF Parametric test
- RF Conformance Test
- Protocol Conformance Test
- Carrier Acceptance Test
- UE Production
Efficient Smartphone Development

Signalling Tester MD8475A provides efficient environment for Smartphone integration and verification.

**Multi-standard Network Simulation**
- LTE-FDD/TD-LTE/LTE-Advanced
- W-CDMA/HSPA/HSPA Evolution
- GSM/GPRS/EGPRS
- CDMA2000 1X/1xEV-DO
- TD-SCDMA/HSPA

**Easy-to-use GUI-based Operation**
- Remote interface for test automation

**Main Applications**
- Call Processing Function Verification
- VoLTE/RCS/IMS/Supplementary Services
- Wi-Fi Offload
- Battery Life Test
- Multi-RAT Mobility and Roaming
- Mobile Service Integration
Support the Smartphone test by one box

MD8475A
Signalling Tester

- Smartphone application test is supported strongly by simple GUI and built-in IMS server
- Support the roaming test and complicated mobility test
SmartStudio - Easy Operation with State-machine GUI

- Interactive test environment without complicated test scripts
- Synchronize built-in IMS server
- Set various network parameters according to user test environment
- Automatic call setting is performed according to DUT capability
- Unique graphical SMS/PWS center application available for SMS/CMAS/ETWS service

Various system

IMS Services

SMS Centre

Extensive network parameters

- LTE FDD LTE TDD
- W-CDMA HSPA evo DC-HSDPA
- GSM GPRS EGPRS
- CDMA2000 1X/1xEV-DO
- TD-SCDMA TD-HSPA
Mobility Test – Multi system configuration

SmartStudio supports multi-system simulation without complicated test script.

- Cell selection & Reselection
- Handover (Intra/Inter-RAT)
  - Redirection / Active HO
- CSFB / e1xCSFB
- SRVCC
- Roaming

- 2-cell configuration

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Repeatable simulation cannot be realized on the Real Network
Comprehensive Test Environment - IMS Services

Key Unique Points

☑ Ease of use
  • SmartStudio GUI allows users to set and configure the IMS test easy
  • No complicated test scripts are required for IMS setting

☑ Comprehensive IMS Test
  • Supports a lot of tests including irregular tests and supplementary service
  • PSAP of Add-in Service has functions to emergency test and loop back voice data

☑ Analysis and Debug
  • Wireshark and Signalling protocol logging can be checked simultaneously

☑ Built-in Servers
  • IMS and relevant application server can be installed within single platform
  • No external server required then realize small-footprint environment

☑ Multi-RAT Expandability
  • Enough expandability for SRVCC tests
Message Service Test – SMS/RCS

- Built-in SMS Centre support both procedures
  - SMS over SGSN
  - SMS over IMS

- Built-in IMS server supports RCS features
  - 1 to 1 chat
  - Group chat
  - Standalone Messaging

RCS option is required.
Message Service Test – Public Warning System

- Public Warning System (PWS) Message test
  - Earthquake Tsunami Warning System (ETWS) on LTE/WCDMA
    - Primary Notification
    - Secondary Notification
  - Commercial Mobile Alert Service (CMAS) on LTE/W-CDMA/CDMA2000/GSM

![PWS Centre](image1)
![ETWS (LTE/W)](image2)
![CMAS (LTE/W/G)](image3)
![CMAS (CDMA2000)](image4)
Network Failure Simulation – UE/Network Trigger (1/2)

- Abnormal testing can be performed by easy setup.
  - **Attach Reject**
    Setting specific messages when the terminal connects to the base station can be used to reject terminal connection requests.
    (Support system are LTE, W-CDMA, GSM, TD-SCDMA)
  - **APN Reject**
    Setting specific messages when the terminal connects to the network server can be used to reject terminal connection requests.
    (Support system are LTE, W-CDMA, GSM, TD-SCDMA, EVDO)
Network Failure Simulation – UE/Network Trigger (2/2)

- Abnormal testing can be performed by easy setup.
  - UE Message Reject
    Setting to reject by the condition when MD8475A receives a specified message from UE.

Note: UE Trigger Information Condition can specify several conditions to one UE Message and it perform Accept or Reject or Ignore according to the setting.

 e.g. One Specified Message -> Condition A -> Reject
      -> Condition B -> Ignore
      -> Condition C -> Accept
WLAN Calling

SmartStudio supports various IMS and ePDG parameters required for the application test.

- Note: This solution needs to use commercial WLAN-AP. (Recommended model: CISCO AIR-SAP2602E-x-K9)
Test Automation Framework - SmartStudio Manager

Contribute to the reduction of UE verification cycle and to efficiency of regression test
- Minimize field/drive testing, characterize performance, test applications

- Ease of use, without requiring in depth knowledge of 3GPP protocols
  - Intuitive graphical user interface to expedite creation and execution of test cases
- Evaluates application behavior under different network conditions
  - Simulate different QoS, data throughput and mobility scenarios
- Captures logs and reports results to application developer
  - Provides protocol log of message sequence for analysis

More than 180 various sample test cases available for fully automated Regression Test and Stress Test

- Intuitive graphical user interface to expedite creation and execution of test cases
- Provides protocol log of message sequence for analysis

SmartStudio Manager
Battery Consumption Test - SmartStudio Manager

Basic Test for TS09
- Stand-by Test
- Talk time Test
- Packet Switch Transfer Test
- Browsing Test
- Streaming Content Test
- Video Telephony Test
- FTP Download Test

SmartStudio Manager

Current consumption vs time plot
Running average & latest current measurement value

Each raw sampling data is saved to the Report folder as CSV file
Appendix
Ex. Application test – Internet connection

Easily simulation for complicated application

- Stable operation check and power consumption under the real application of Smartphone.
# eCall/ERA-GLONASS Test

Supports to emulate eCall communications between the IVS and PSAP.

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<thead>
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<th>Cellular Network</th>
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<td>Target</td>
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- **GPS**: Satellite system for navigation and location services.
- **Automobile**: Vehicle equipped with eCall capabilities.
- **Cellular Network**: Network infrastructure including Base Station.
- **PSAP**: Public Safety Answering Point.

Base Station Simulator MD8475A

**Base Station**

- **W-CDMA/GSM Network**: Communication network.
- **PSTN**: Public Switched Telephone Network.

**DUT**

- **W-CDMA/GSM Communication**: Communication between DUT and Base Station.

**IVS**

- **Voice Data**
- **SMS Data**

**eCall/ERA-GLONASS Application**

**eCall MSD Communication Test/Voice Call Test**

**ERA-GLONASS MSD Communication Test/Voice Call Test**
MD8475A Product Introduction

- **LTE system simulation for FDD and TDD**
- **Support 150 Mbps throughput with 2x2 MIMO and 300 Mbps for 2CCs 2x2MIMO**
- **Multi-system capable platform**
  - W-CDMA/HSPA/HSPA evo/DC-HSDPA, GSM/GPRS/EGPRS
  - CDMA2000 1X/EV-DO, TD-SCDMA/HSPA
- **Easy operation with State-machine based GUI “SmartStudio”**
- **2-cell IntraRAT / InterRAT capable platform**
  - 2-cell IntraRAT: LTE 2-cell, W-CDMA 2-cell, GSM 2-cell, TDS 2-cell
  - 2-cell InterRAT: LTE/W, LTE/G, LTE-TDD/TDS, W/G, TDS/G
  - LTE-cdma2000 (Hybrid mode) 2-box Interworking, Optimized HO
  - LTE-cdma2000 single-box Interworking with 2RF
- **Built-in IMS service function**
  - CSCF/DHCP/DNS Server functions
  - NDP/XCAP/GBA/Early Media function
  - IMS Supplementary Service
  - RCS (Rich Communication Suite)
  - Script-based I/F for advanced test
- **Built-in SMS center**
- **Built-in PWS center**
  - ETWS (LTE/W-CDMA/GSM)
  - CMAS (LTE/W-CDMA/GSM/cdma2000)
- **Built-in PHY/IP layer throughput monitor**
- **Built-in UE/Network Trigger function**
  - Sub-normal condition(LTE/W-CDMA/GSM/TD-SCDMA))
- **UL RF power measurement** (LTE/W-CDMA/GSM)

**WLAN Offloading**
- EAP authentication
- ePDG access
- ANDSF policy distribution

**Automation**
- Remote control of SmartStudio
- Script-based automation engine
- Included more than sample 160 TCs
Test Automation Framework – ACTS

The Android Open Source Project (AOSP) provides a Python-based test suite using the MD8475A for some tests.

The AOSP provides the Android Connectivity Testing Suite (ACTS) to verify Bluetooth, Wi-Fi, and cellular radios. The MD8475A is used to perform the ACTS cellular tests. [https://source.android.com/devices/tech/connect/connect_tests](https://source.android.com/devices/tech/connect/connect_tests)

ACTS is the AOSP deliverable. To use ACTS, read the license page. [https://source.android.com/setup/licenses](https://source.android.com/setup/licenses)

The Android Comms Test Suite includes more than 170 cellular tests in acts/tests/google/tel/lab.

- CMAS
- ETWS
- Emergency Call
- Data Roaming On/Off
- Throughput
- Power Consumption
- Handover
- Neighbour Cell
- SMS
- UE Identity
- VoLTE

![Android Comms Test Suite](https://source.android.com/devices/tech/connect/)

**Network Connectivity Tests**

Android Connectivity Testing Suite (ACTS) tests fill the testing gap for certifications. These tests validate the functionality of various aspects by the Android framework.

**Who should run ACTS tests?**

ACTS tests should be run by developers and integrators who are working on portions of the Android stack. If you are adding new features, integrate tests to help you ensure that your changes are functional and stable and that they do not break existing functionality.

These tests are optional and are not required for any Android device.