XCAL-Mobile 4G

(For Android OS)

User Guide

Doc Rev: 2

Product Version: 4.3.xx

2013. 04

Accuver

Accuver Co., Ltd.,

Address: #1-301, Complex 2, Pangyo7 Techno Valley #633, Sampyung-Dong, Bundang-Gu, Seongnam-Si, Kyungki-Do

Web site: www.Accuver.com

Phone #: +82-31-788-1700

Fax #: +82-31-705-1246

Contents

Overview

XCAL-Mobile 4G is a handheld based stand-alone application running on smart phones that enables QoS and QoE testing across all WCDMA, GSM, and LTE technologies. XCAL-Mobile 4G application on smart phone in Android OS supports extensive application testing and delivers real-time network measurement and visualization.

XCAL-Mobile 4G is provided for both indoor and outdoor measurement while it is also available for field drive test when it is installed inside of a moving vehicle. It supports remote control function by connecting with other server solution series of Accuver. All features can be controlled by using normal handset keys.

Special Features

- Generates and terminates voice and data calls automatically.

- Creates and edits measurement scenarios in portable smart phone.

- Performs voice and data call measurement simultaneously.

- Monitors statistics in real-time in message, graph, table, and map.

- Provides multiple types of call events and parameters for technologies.

- Shows monitoring data in mobile window as the logging file is provided in *.drm and *.csv format.

- Supports both indoor and outdoor measurement.

- Supports Replay mode.

- Exports logging file to server both manually and automatically.

- Reports errors of the program via e-mail automatically.

Specification

- **Technology**: CDMA/EVDO, WCDMA, LTE

  Supportive technology varies depending on Smart Phone model. For detail, see **Appendix: Support Technology for Smart Phone Model**.

- **Terminal**: Android smart phone OS up to Jelly Bean (v4.1)

- **Recommended RAM memory**: 812 MB

- **Call Type**: Voice, FTP, Web, E-Mail, Iperf, Ping, YouTube, VoLTE, Multi Call, Multi RAB

- **RF Parameter**: Android RF Info, WiFi Info, 3G Summary, 3G Signal, 3G Cell, LTE Summary, LTE Signal, LTE Cell, LTE Tx Power, LTE SIB1

Getting Started

This chapter describes how to install XCAL-Mobile 4G application in smart phone:

- **How to Connect a PC to an Android-OS smart phone.**

- **How to install a file explorer application in Android-OS.**

- **How to copy XCAL-Mobile 4G program (*.apk) to Android-OS smart phone.**

Connecting PC and smart phone

In order to install XCAL-Mobile 4G application on your smart phone, you first need to connect your smart phone and PC by phone cable.

1. Connect PC and an Android-OS smart phone by phone cable.

2. Swipe down from the top of smart phone screen to open notification center.

3. Tap **USB connected**.

4. Tap **Turn on USB storage** button.

5. PC and Android-OS smart phone is connected successfully.

Installing file explorer application (ES File Explorer)

ES File Explorer application helps you to navigate through your smart phone.

1. Tap **Market** icon on your smart phone to open Android Market.

2. Android Market main screen appears. Tap **Search** icon.
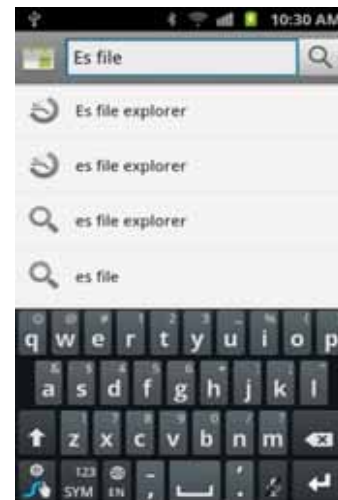
3. Search for ES File Explorer.

4. Download and install the ES File Explorer application on your smart phone.

5. ES File Explorer application is successfully installed.

Transferring XCAL-Mobile 4G program file

You need to copy and paste XCAL-Mobile 4G application file in *.apk format onto your smart phone.
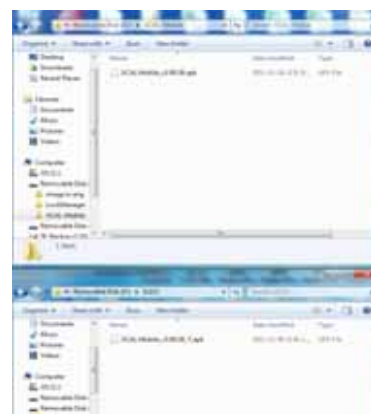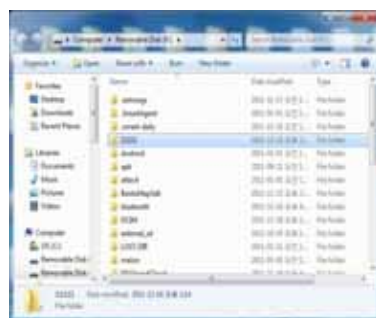
1. In PC, open driver of smart phone.

2. Create a new folder.

3. Copy and paste XCAL-Mobile 4G program file (*.apk) into the new folder.

    XCAL-Mobile 4G program file (*.apk) is provided upon purchase.

4. In smart phone, tap **ES File Explorer** icon to execute.

5. Tap the new folder which was created via PC.

6. Tap XCAL-Mobile 4G program file (*.apk) to execute.

7. Tap **Install** button.

8. XCAL-Mobile 4G application is successfully downloaded and installed.

Make sure that there is enough hard disc capacity in the smart phone. XCAL-Mobile 4G program file (*.apk) is approx. 10 MB.

Starting XCAL-Mobile 4G

By now, you have completed all necessary steps before starting and are ready to use XCAL-Mobile 4G application on your smart phone.

Before you start XCAL-Mobile 4G, make sure

- **Settings – Date and time** - **Auto (Use network-provided values)** is checked.

- Internet access is available (WiFi, 3G or 4G).
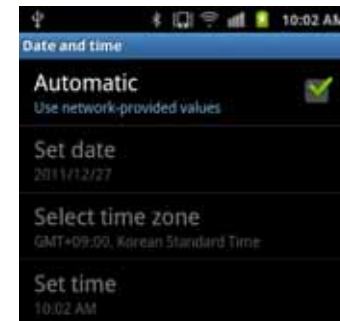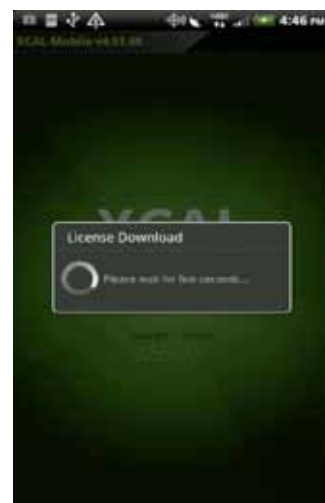
⚠ Prior to using XCAL-Mobile 4G, you should get a valid SW License Key. You may request Accuver sales representative for valid Key by sending your IMSI, IMEI or MAC address information of device.

1. Tap Check Box of valid Key and **License Download** button.
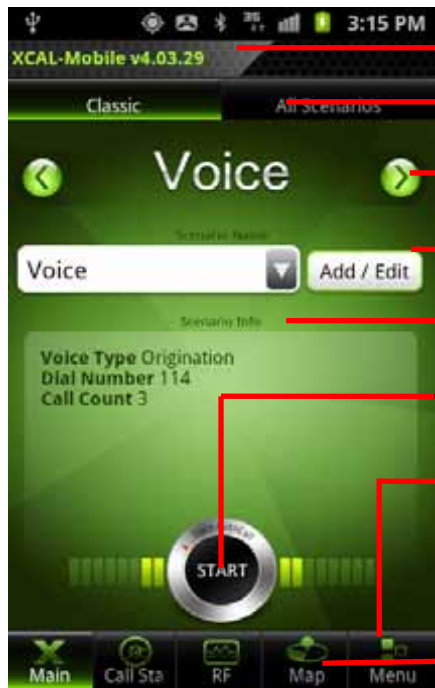
2. License Download Screen appears.

3. Main screen of XCAL-Mobile 4G appears.

💠 MAC address will not be shown when internet access (WiFi or 3G or 4G) is unavailable.

Graphic User Interface

XCAL-Mobile 4G's intuitive and user-friendly user interface helps your measurement projects..

XCAL-Mobile 4G version

Taps Classic or All Scenario tab.

Swipes left and right to select call type.

Taps combo box to select Auto Call scenario.

Shows Scenario details.

Starts AutoCall.

AutoCall Setting, Call History, Other Setting, Log Upload, Logmask Setting
For detail, see **Configuring AutoCall Scenario**, **Call Result History**, **Uploading Log File**, **Additional Function**

Shows data and serving lines in Google map.
For detail of call result, see **Monitoring in Google Map**.

Shows test result in real-time while measurement.
For detail of call result, see **Call Result History**

Shows RF information of smart phone in real-time.
For detail of RF information, see **RF Information**

Select call type and start AutoCall based on call scenario.
For detail of AutoCall test, see **AutoCall Test**.

R_F Information

XCAL-Mobile 4G displays real-time RF information of smart phone.

XCAL-Mobile 4G shows following RF parameters.

- **Android RF**
- **WiFi Info**
- **Signal Messages**
- **3G Summary**
- **3G Signal**
- **3G Cell**
- **LTE Summary**
- **LTE Signal**

- **LTE Cell**
- **LTE Tx Power**
- **LTE SIB1**
- **RTP Summary**
- **CDMA Summary**
- **CDMA Signal**
- **CDMA Cell**
- **EVDO Cell**

RF parameters in *blue* color are available depending on device type.

For details of parameter description of each technology, see **Appendix: Parameter Description**.
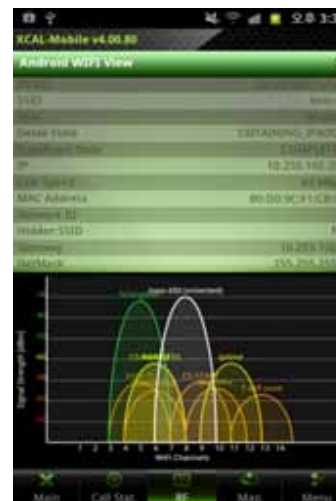
1. In main screen of XCAL-Mobile 4G, tap **RF** button.

2. To select RF parameter, swipe down the green bar at the top of the screen. You can see various RF information view types. Select a view type icon. For details, see next pages.

3. The selected view type screen appears.

Swipe left and right to monitor other RF Information screens.

Swipe up and down to monitor more data in a RF Information screen.

Android RF

Android RF screen shows basic RF information provided by Android OS.
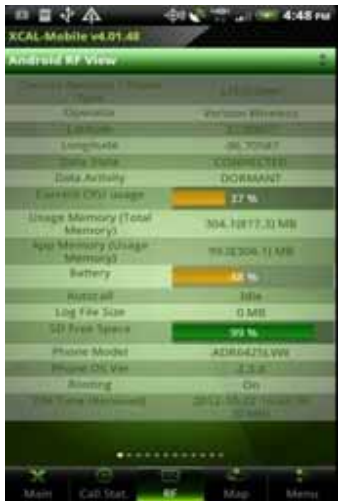
- Current Network/Phone Type
- Operator
- Latitude
- Longitude
- Data State
- Current CPU usage
- Usage/APP Memory
- Battery
- Autocall
- Log File Size
- SD Free Space
- Phone Model
- Phone OS Ver
- Rooting
- DM Time(Received)

WiFi Info

WiFi screen shows information on connected AP and RSSI graphs for all APs.
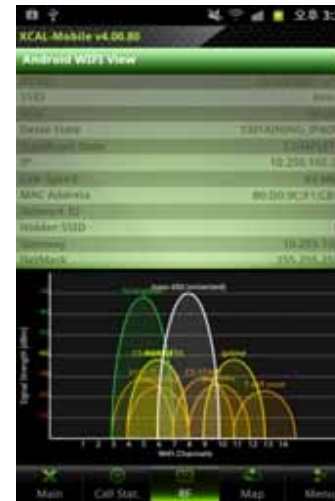
- BSSID
- SSID
- RSSI
- Detail State
- Supplicant State
- IP
- Link Speed
- MAC Address
- Network ID
- Hidden SSID
- Gateway
- NetMask
- DNS1
- DNS2
- Server IP

Signal Messages

Signal Messages screen shows RRC messages of corresponding technology.

Signal Messages is available depending on device type.

• LTE RRC messages

Tap a message from Signal Message list, and corresponding code is shown.

External DM Summary

External DM Summary screen shows information of XCAL-Solo HW. External DM Summary screen shows information when XCAL-Solo HW is connected to smart phone.

- Battery Level: Shows battery status of XCAL-Solo HW.
- Solo Version: Shows XCAL-Solo SW version.
- System Version: Shows XCAL-Solo FW version.
- Serial Number: Shows XCAL-Solo HW serial number.

3G Summary

3G Summary screen shows Rx, Tx, Adj Tx, BLER, CQI, DTX Count, MAC-hs Layer, Physical, FTP Throughput, No. of Codes, RG Down, RG Hold, RG Up, AG, SG, TTI, E-TFCI, UE Power Headroom, SF Codes, Non Serving Cell ACK and Happy bit information.

3G Summary is available depending on device type.

- RRC State
- RB Assignment
- DL UARFCN (Freq)
- UL UARFCN (Freq)
- Rx Power
- Tx Power
- BLER
- SIR
- Best Active PSC
- Best Active Ec/Io
- Best Active RSCP

HSDPA

- CQI
- DTX Rate
- MAC-hs TH
- Served Physical TH
- Scheduled Physical TH
- No. of Codes (Included)

HSUPA

- RG (Down)
- RG (Hold)
- RG (Up)
- AG
- SG
- TTI
- E-TFCI
- UE Power Headroom
- SF Code
- Non Serving Cell ACK
- Happy Bit

3G Signal

3G Signal screen shows Rx, Tx, Adj Tx, BLER, CQI, DTX Count, MAC-hs Layer, Physical, No. of Codes, RG Down/ Hold/ Up, SG, TTI, E-TFCI, UE Power Headroom, Non Serving Cell ACK and Happy bit information

Signal Messages is available depending on device type.

- Rx Power
- Tx Power
- Adj Tx
- BLER
- CQI
- DTX Count
- MAC-hs Layer
- Physical(served,Scheduled)
- No. of Codes
- RG Down/Hold/Up
- SG
- TTI
- E-TFCI
- UE Power Headroom
- Non Serving Cell ACK
- Happy bit

- Tap G1, G2 buttons to show each parameter in the upper and lower graph respectively. Maximum of 2 parameters can be shown in each graph.

3G Cell 📊

3G Cell screen shows Set, PSC, EcIo, RSCP and Cell Graph.

Colors of Set and Graph line are the same.

💡 3G Cell is available depending on device type.

- Set
- PSC
- EcIo
- RSCP
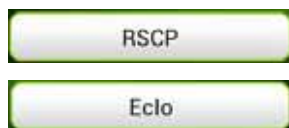
- Tap RSCP, EcIo button to show RSCP and Ec/Io of Cell Measurement. Default is set to RSCP. Tap EcIo button to initiate graph.

LTE Summary 📱

LTE Summary screen shows MCC, MNC, Wideband PMI, Traffic State, FTP Throughput, RSRP, RSRQ, RSSI, Tx Power, SINR, CQI, Rank Index, EARFCN (DL/UL), DL/UL Bandwidth, Band Indicator, Tracking Area Code, Cell ID, Allowed Access, EMM State and EMM Substate.

💡 LTE Summary is available depending on device type.

- MCC/MNC, PCI, Wiseband PMI
- Traffic State
- RSRP
- RSRQ
- RSSI
- Tx Power
- SINR
- CQI
- Rank Index
- EARFCN (DL/UL)
- Bandwidth (DL/UL)
- Band Indicator
- Tracking Area Code
- Cell ID
- Allowed Access
- EMM State
- EMM Substate
- DL/UL Transmission Mode
- Path Loss
- Num of Tx/Rx Antenna

LTE Signal

LTE Cell

LTE Signal screen shows RSRP, RSRQ, RSSI, Tx Power, SINR, CQI, and Rank Index.

LTE Cell screen shows Set, EARFCN, PCI, RSRP, RSRQ, and Cell Graph. Colors of Set and Graph line are the same.

LTE Signal is available depending on device type.

LTE Cell is available depending on device type.

- RSRP
- RSRQ
- RSSI
- Tx Power
- SINR
- CQI
- Rank Index

- Set
- EARFCN
- PCI
- RSRP
- RSRQ
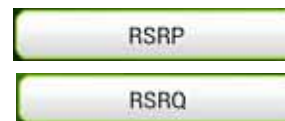
- Tap RSRP, RSRQ button to show RSRP and RSRQ of Cell Measurement. Default is set to RSRP. Tap RSRQ button to initiate graph.

LTE Tx Power 〰

LTE SIB1 📊

4G Tx Power screen shows Start Time, Last Updated Time, Tx Power, Sync Time, and X-Axis Resolution

⚙ LTE Tx Power is available depending on device type

LTE SIB1 screen shows Time, Freq Band, TAC, Global Cell ID, Cell Barred, Intra Freq Reserved, SI Window Len, SI Value Tag, Q-RxLevMin, Q-RxLevMinOffset, MCC, MNC, and Operator Use information.,

⚙ LTE SIB1 is available depending on device type.

- Start Time
- Last Updated Time
- Tx Power
- Sync Time
- X-Axis Resolution

- Time
- Freq Band
- TAC
- Global Cell ID
- Cell Barred
- Intra Freq Reserved
- SI Window Len
- SI Value Tag
- Q-RxLevMin
- Q-RxLevMinOffset
- MCC
- MNC
- Operator Use

RTP Info

VoLTE Summary screen shows Rx Packet Loss, Rx RTP Throughput, Rx Delay, Rx Delta Delay, Rx Jitter, One Way Delay, RTP Packet Count, and Round Trip Time.

RTP Info is available on VoLTE call running.
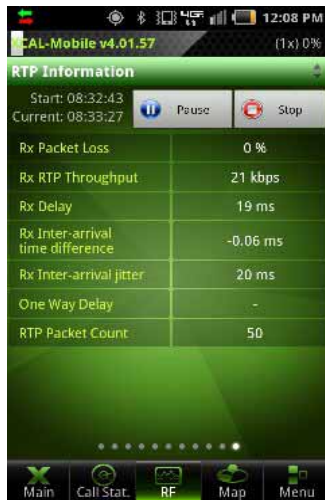
- Rx Packet Loss
- Rx RTP Throughput
- Rx Delay
- Rx Delta Delay
- Rx Jitter
- One Way Delay
- RTP Packet Count
- Round Trip Time

CDMA Summary

CDMA Summary screen shows Rx Power, Tx Power, PN, Ec/Io, State, Channel, Band Class, P Rev, SID, NID, SINR, DRC Rate, DSC Value, DSC Cover, Air Link State, Session State, and UATI.

- Rx Power
- Tx Power
- PN
- Ec/Io
- State
- Channel
- Band Class
- P Rev
- SID
- NID
- SINR
- DRC Rate
- DSC Value
- DSC Cover
- Air Link State
- Session State
- UATI

CDMA Signal 📊

CDMA Signal screen shows Rx Power, Tx Power, Ec/Io, and SINR or CDMA/EVDO.

- Rx Power
- Tx Power
- Ec/Io
- SINR

CDMA Cell 📋

CDMA Cell screen shows PN, Ec/Io, and Channel information of CDMA.

- PN
- Ec/Io
- Channel

EVDO Cell

EVDO Cell screen shows PN, Ec/Io, and Channel information of EVDO.
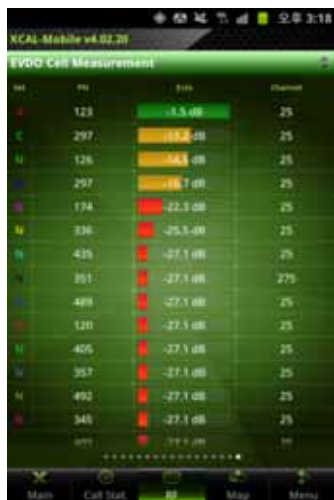
- PN
- Ec/Io
- Channel

R_F Information of Samsung chip

XCAL-Mobile 4G displays real-time RF information of smart phone with Samsung Chip.

XCAL-Mobile 4G shows following RF parameters.

- **Android RF**
- **WiFi Info**
- **Signal Messages**
- **4G Summary**
- **4G Signal**

- **4G Cell**
- **4G Tx Power**
- **4G SIB1**
- **4G Handover**
- **4G RACH**

RF parameters in *blue* color are available depending on device type.

1. In main screen of XCAL-Mobile 4G, tap **RF** button.

2. To select RF parameter, swipe down the green bar at the top of screen. You can see various RF information view types. Select a view type. For details, see next pages.

3. The selected view type screen appears.

Android RF

Android RF screen shows basic RF information provided by Android OS.

- Current Network/Phone Type
- Operator
- Latitude
- Longitude
- Data State
- Current CPU usage
- Usage/APP Memory
- Battery
- Autocall
- Log File Size
- SD Free Space
- Phone Model
- Phone OS Ver
- Rooting

WiFi Info

WiFi screen shows information on connected AP and RSSI graphs for all APs.
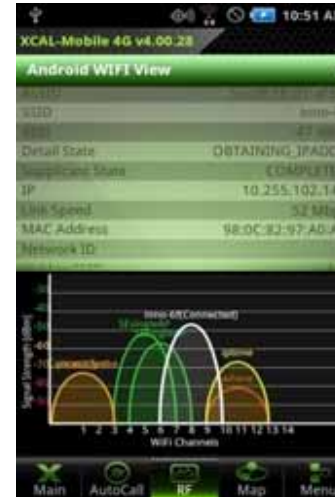
- BSSID
- SSID
- RSSI
- Detail State
- Supplicant State
- IP
- Link Speed
- MAC Address
- Network ID
- Hidden SSID
- Gateway
- NetMask
- DNS1
- DNS2
- Server IP

Signal Messages

Signal Messages screen shows RRC messages of corresponding technology.

Signal Messages is available depending on device type.

- LTE RRC messages

Tap a message from Signal Message list, and corresponding code is shown.

4G Summary

4G Signal

4G Summary screen shows RAT, APN, Modem Status, MIMO Type, DL/UL Frequency, Tx Power, PRACH Tx Power, PCI, RSRP, RSRQ, RSSI, DL BLER, DL/UL Throughput, RRC State, EMM State, EMM Func State, DL/UL RB Num, MCS, GPS Performance, and Battery Info.

4G Signal screen shows RSRP, RSRQ, RSSI, Tx Power, PRACH Tx Power, and DL/UL Throughput

LTE Summary is available depending on device type.

LTE Signal is available depending on device type.

- RAT/ APN
- Modem Status
- MIMO Type
- DL/UL Frequency
- Tx Power
- PRACH Tx Power
- PCI
- RSRP(Ant0,1)
- RSRQ(Ant0,1)
- RSSI(Ant0,1)
- DL BLER
- DL/UL Throughput
- RRC State
- EMM State
- EMM Func State
- DL/UL RB Num, MCS
- GPS Performance
- Battery Info

- RSRP.Ant.0
- RSRQ.Ant.0
- RSSI.Ant.0
- RSRP.Ant.1
- RSRQ.Ant.1
- RSSI.Ant.1
- Tx Power
- PRACH Tx Power
- DL/UL Throughput

- Tap G1, G2 buttons to show each parameter in the upper and lower graph respectively. Maximum of 2 parameters can be shown in each graph.

4G Cell

4G Cell screen shows EARFCN, PCI, RSSI, RSRP, and RSRQ.

LTE Cell is available depending on device type.

- EARFCN
- PCI
- RSSI
- RSRP
- RSRQ

4G Tx Power

4G Tx Power screen shows Start Time, Last Updated Time, Tx Power, Sync Time, and X-Axis Resolution

LTE Cell is available depending on device type.

- Start Time
- Last Updated Time
- Tx Power
- Sync Time
- X-Axis Resolution

4G SIB1

4G Handover

4G SIB1 screen shows Time, Freq Band, TAC, Global Cell ID, Cell Barred, Intra Freq Reserved, SI Window Len, SI Value Tag, Q-RxLevMin, Q-RxLevMinOffset, MCC, MNC, and Operator Use information.,

4G Handover screen shows Time, Success Rate, Fail Rate, C Plane Latency, and U Plane Latency.

LTE Cell is available depending on device type.

LTE Cell is available depending on device type.

- Time
- Success Rate
- Fail Rate
- C Plane Latency
- U Plane Latency

- Time
- Freq Band
- TAC
- Global Cell ID
- Cell Barred
- Intra Freq Reserved
- SI Window Len
- SI Value Tag
- Q-RxLevMin
- Q-RxLevMinOffset
- MCC
- MNC
- Operator Use

4G RACH

4G RACH screen shows RACH messages of corresponding technology.

4G RACH is available depending on device type.

- 4G RACH Messages

Tap a message from Signal Message list, and corresponding code is shown.

Configuring LogMask

Before you begin measurement project, you are able to define log codes to collect and monitor. By selecting necessary log codes for each technology, you may save time for creating logging file and performance capacity.

Log codes list varies depending on chipset type.

Configuring LogMask Setting

In LogMask Setting screen, select technology tab at the top of the screen and select the chekboxes of log codes to collect and monitor.
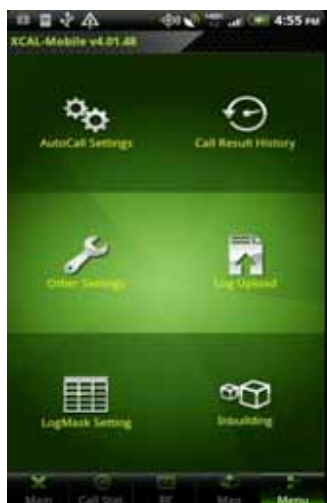
1. Tap **Menu** - **Log Mask Setting** button.

2. LogMask Option Setting screen appears. Tap a technology tab to configure log codes at the top of the screen.

3. Tap **+** button to expand log code list for the technology.

4. Select the checkboxes of log codes to measure and tap **Apply & Save** button.
    Or, Tap **Recommend** button to select recommended log codes.

LogMask Setting: LTE, CDMA&EVDO, HSDPA&WCDMA, HSUPA, GSM/GPRS, UMTS

Configuring LogMask Setting of Samsung Chip

In LogMask Setting screen, select techbology tab at top of the screen and select the chekboxes of log codes to be collected and monitored.
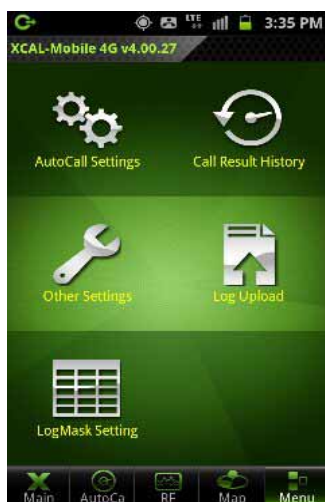
1. Tap **Menu** - **LogMask Setting** button.
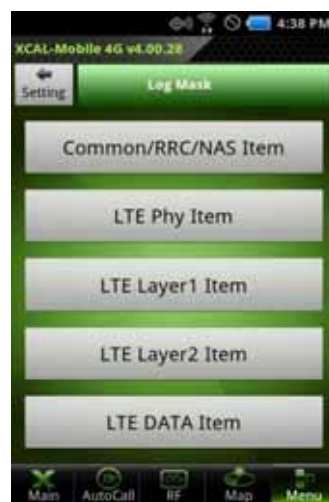
2. LogMask Option Setting screen appears. Tap **Common/RRC/NAS Item** button.
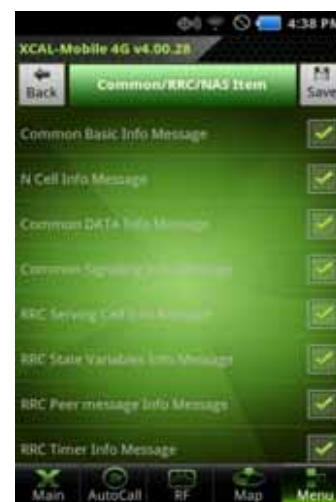
3. LTE LogMask Setting Screen appears.

4. Select the checkboxes of code codes to measure, and tap **Save** button.

5. The configured LogMask setting is saved successfully.

LogMask Setting: Common/RRC/NAS, LTE Phy, LTE Layer1, LTE Layer2, LTE DATA

Performing AutoCall Test

XCAL-Mobile 4G generates and terminates voice and data calls automatically.

- **Configures and edits AutoCall scenario.**

- **Starts AutoCall test.**

- **Terminates AutoCall test.**

Creating AutoCall Scenario

Before you start AutoCall test, you need to pre-configure AutoCall scenario (script). AutoCall scenario can be configured and edited in smart phone.

XCAL-Mobile 4G supports call types of Voice, FTP, Web, SMS, WiFi, E-Mail, Ping, and YouTube.

1. In main screen of XCAL-Mobile 4G, tap **Menu** tab.
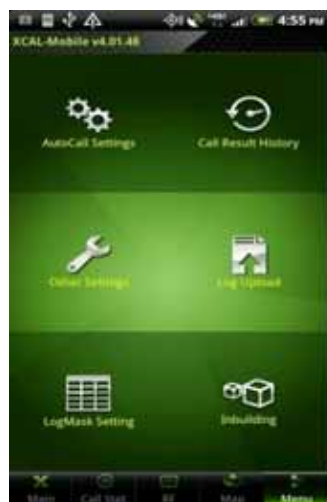
2. Tap **Autocall Settings**.

    Or, tap **Scenario Edit** button at the lower left corner of Main screen to move to AutoCall Scenario creation screen directly.

3. Tap a call type.

    Get Scenario: Downloads created AutoCall Scenario from FTP server to XCAL-Mobile. See **Downloading AutoCall Scenario**.

4. Enter a call name in **Call Name** entry field.
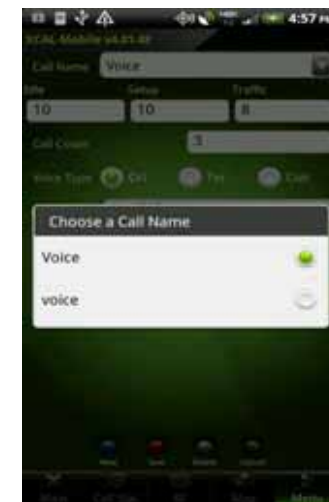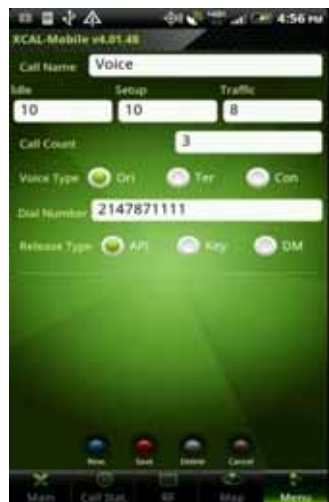
4. Configure AutoCall scenario.

For detail of how to configure AutoCall scenario for each call type, see **Appendix: Configuring AutoCall Scenario**

5. Tap **Save** button.

6. A new AutoCall scenario is created successfully.

7. Tap Call Name combo box, and you may find the created scenario in the list.

To edit existing scenario, open a scenario configuration screen, edit setting, and tap **Save** button.

To create more scenarios, tap **New** button.

Importing AutoCall Scenario

Created AutoCall scenario can be downloaded from ftp server to XCAL-Mobile.

Name of AutoCall Scenario file in FTP should be *AutoCallScenarioAlias.ini* or *AutoCallScenarioSet.ini*.
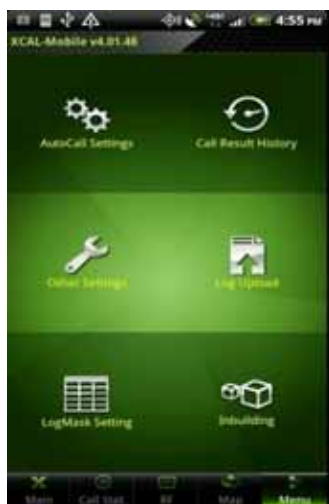
1. Tap **Menu** – **AutoCall Settings** button.

2. Tap **Get Scenario** button in AutoCall Settings screen.

3. **G ET SCENARIO** screen appears. Configure ftp server information to download AutoCall scenario.

4. Tap **Get** button.

Starting AutoCall Test (In Classic tab)

You may start AutoCall test by tapping **Start** button in **Main** tab, and AutoCall test is started based on configured AutoCall scenario.

1. Tap **Main** tab.	2. Swipe left and right on **Call Type** section to select a call type to test. And tap **Scenario Name** combo box to select a call scenario.	3. Tap **Start** button to start AutoCall.	4. AutoCall test starts.
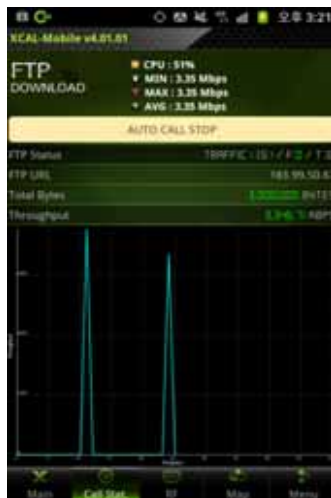
5. Main screen moves to Call Stat. tab, and shows test status in table and graph.

6. Tap the graph at the bottom of the screen, and shows status data in table.
    Tap the table to show data in graph vice versa.
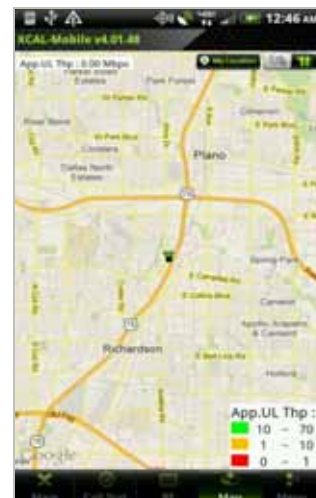
7. During measurement, tap **Map** button to display measurement data and serving line graphically in Google map in real-time. For details, see **Monitoring in Google Map**.

8. When automated call test is automatically terminated based on pre-configured call script, Result History screen appears. For details, see **Call Result History**.

Starting AutoCall Test (In All Scenario tab)

You may start AutoCall test by tapping **Start** button in **Main** tab, and AutoCall test is started based on configured AutoCall scenario.

1. Tap **Main** tab.

2. Tap **All Scenario** tab.

3. Select a pre-configured AutoCall scenario, and tap **START** button to start AutoCall.
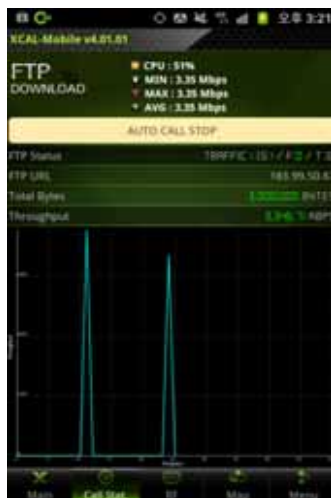
4. AutoCall test starts.

5. Main screen moves to Call Stat. tab, and shows test status in table and graph.

6. Tap the graph at the bottom of the screen, and shows status data in table.
    Tap the table to show data in graph vice versa.
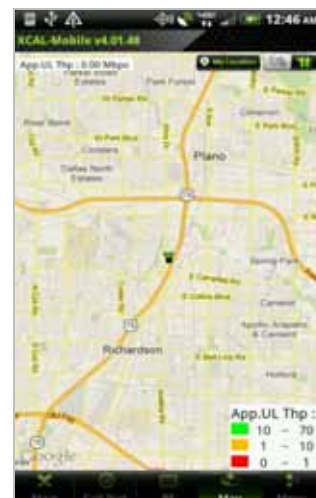
7. During measurement, tap **Map** button to display measurement data and serving line graphically in Google map in real-time. For details, see **Monitoring in Google Map**.

8. When automated call test is automatically terminated based on pre-configured call script, Result History screen appears. For details, see **Call Result History**.

Terminating AutoCall Test

XCAL-Mobile 4G normally terminates an AutoCall test automatically when it runs through the whole course of the AutoCall scenario (script). However, it can be also be terminated by tapping **AUTOCALL STOP** button during AutoCall measurement.

When it is terminated, **Result History** screen appears. Tap one of AutoCall tests, its details are shown.

For detail, see ***Call Result History***.

1. AutoCall test is terminated automatically.

2. Or, you can terminate AutoCall test while measurement.(**Auto Call Stop Button**)

Monitoring in Google Map

Measurement data and serving lines are visualized in map in real-time during measurement. Internal GPS of smart phone is used for location information, and if you import BTS/Repeater data, map displays their information. Google map supports two map types; image map and satellite map.

The speed at which Google Map displays greatly depends on the internet access speed of the handset itself. 3G coverage area shows faster update than that of 2G coverage area.

- **Displays data in Google map.**
- **Configures map options.**
- **Configuring Map Options - Parameters**
- **Configuring Map Options - Settings.**
- **Imports BTS/Repeater Data**

Displaying Data in Google Map

XCAL-Mobile enables you to see measurement data and serving lines in Google map.
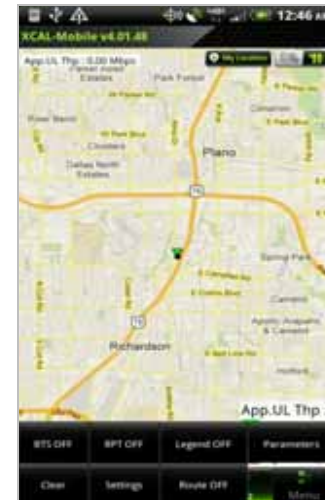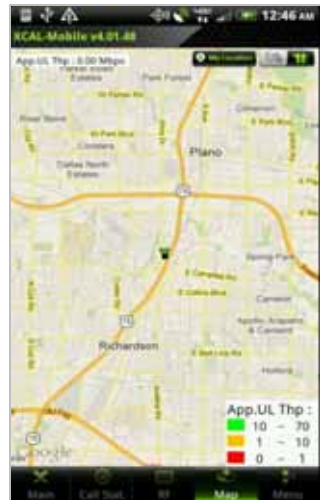
1. In main screen of XCAL-Mobile, tap **Map** tab.
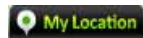
: Marks current location in green color in Google map.

: Shows satellite

: Shows image map.

2. Tap **Menu** button on smart phone hardware to open **Setting** window.

Configuring Map Options

XCAL-Mobile enables you to change map setting in Google map. To open Map Options, tap **Menu** button on smart phone hardware.
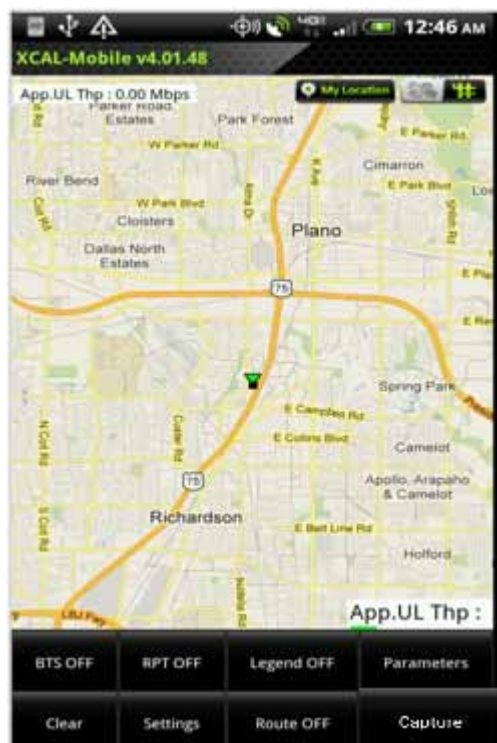
Items	Description
BTS On/Off	Shows/Hides BTS in map.
RPT On/Off	Shows/Hides Repeater in map.
Legend On/Off	Shows/Hides legend in map.
Parameter	Selects parameters of technologies to display in map. For details, see **Configuring Map Options – Parameters**.
Clear	Clears data in map.
Call Event On/Off	Shows/Hides call events in map.
Settings	Configures symbol size, update time interval, minimum distance for data update, user location, BTS/RPT size, serving line width, and importing BTS data from FTP/local disk. For details, see **Configuring Map Options – Settings**.
Route On/Off	Shows/Hides Route in map.
Capture	Captures current screen.

Configuring Map Options – Parameters

Parameters button in Map Options menu selects parameters of technologies to display in map.

Tap **Parameters** button, and Parameters pop-up screen appears. Select technology and corresponding parameter you want to display on the map.

Items	Description
Common	App. DL Throughput /APP. UL Throughput
	Network Type
LTE	RSSI / RSRP
	RSRQ /SINR
3G	Rx Power / Tx Power
	SIR
	Best Active Set Ec/Io
	Best Active Set RSCP
2G	Rx power
	Rx Qual(Full) / Rx Qual(Sub)
	TA, RLT
CDMA	Rx Power / Tx Power
	Ec/Io
EVDO	Rx Power / Tx Power
	Ec/Io, SINR

Configuring Map Options – Settings

Settings button in Map Options menu configures symbol size, update time interval, minimum distance for data update, user location, BTS/RPT size, serving line width, and importing BTS data from FTP server or local disk.

Items	Description
Symbol Size	Configures symbol size that is currently displayed in the map.
Update Time	Configures time to update to the map. (unit: sec)
Min. Distance	Configures minimum distance to move to update to the map. (unit: meter)
Auto Focus	Places user location at the center of map when the current location is out of the map.
Offline Map	Loads and displays mobile local disc map when data connection (3G, WiFi, LTE, etc.) is unavailable.
BTS/RPT Size	Configures BTS/Repeater size.
Line Width Size	Configures serving line width.
BTS Update From FTP Server / Local Disk	Imports BTS data from FTP server or Local Disk. Tap **BTS Update From FTP Server / Local disk** button, and configure FTP server / Local Disk information where BTS data file is saved. BTS data file should be in *.ini format. For details, see **Importing BTS/Repeater Data**. ⓘ Some FTP server requires Passive Mode on.

Importing BTS/Repeater Data

Existing BTS/Repeater data file in FTP server or smart phone local disc can be imported to XCAL-Mobile.

eNB ID	eNB Name	Longitude	Latitude	Altitude	Height	Cell Size	I/O Type	In-Service	eNB Image	EARFCN	PCI	Band	Azimuth	Angle
DX0224_C	DX0224	-96.7972	32.73728	492	72	4				26050	78	Band 25	300	0
DX0276_C	DX0276	-96.7258	32.74875	396.88	95	4				26053	81	Band 25	300	0
DX0349_B	DX0349	-96.7121	32.71303	416.56	121	4				26056	84	Band 25	180	0
DX1721_A	DX1721	-96.8048	32.72086	587.12	121	4				26059	87	Band 25	60	0
DX4093_A	DX4093	-96.8006	32.71069	574	64	4				26062	90	Band 25	0	0
DX4203_A	DX4203	-96.7506	32.70486	410	100	4				26065	93	Band 25	0	0
DX4210_A	DX4210	-96.7736	32.69458	475.6	102	4				26068	96	Band 25	0	0

[File Name Format]

- BTS File: *name of technology.ini*

- Repeater File: *name of technology_R.ini*

CDMA	2012-08-21 오후...
CDMA_R	2007-03-08 오후...
EVDO	2007-03-08 오후...
EVDO_R	2007-03-08 오후...
GSM	2007-03-08 오후...
GSM_R	2007-03-08 오후...
LTE	2012-08-21 오후...
LTE_R	2007-03-08 오후...
WCDMA	2010-04-21 오후...
WCDMA_R	2007-03-08 오후...

1. In main screen of XCAL-Mobile, tap **Map** tab.
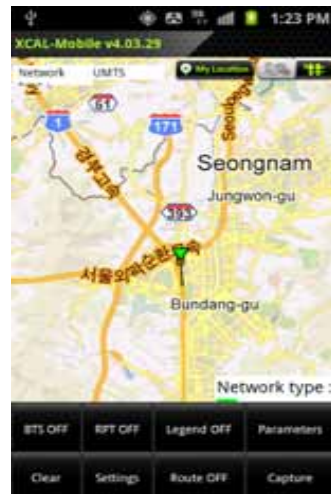
2. Tap **Menu** button on smart phone hardware to open **Setting** window.

BTS Update From FTP Server: Imports existing BTS/RPT data file from designated FTP server.

BTS Update From Local Disk: Imports existing BTS/RPT data file from smart phone local disc.

[BTS Update from FTP Server]

a. Tap **BTS Update from FTP Server** button. **BTS DB Server Settings** screen appears.

b. Configure FTP information, and tap **BTS Update** or **Repeater Update** button.

c. XCAL-Mobile application connects to the configured FTP server and Server Connected pop-up message appears.

d. Tap to select *.ini file to import from DB file list.

e. Tap **Yes** button.

f. Make sure **DB Updated** pop-up message is displayed.

g. Tap Save button to load imported BTS/RPT data file to map.

h. Imported BTS/RPT data is displayed in map.

[BTS Update from Local Disk]

a. Tap **BTS Update from Local Disk** button. **BTS Update From Local Disk** screen appears.

b. Tap **BTS/Repeater Update** button.

c. **Cell site DB Update** screen appears.

d. Tap to select *.ini file to import from DB file list.
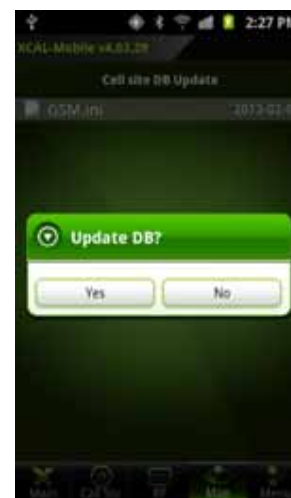
e. Tab **Yes** button.

f. The selected BTS/RPT file is imported to XCAL-Mobile with the pop-up message of **DB Updated**

Call Result History

XCAL-Mobile 4G provides a list of AutoCall test you have completed and its details.

The list of AutoCall test result (**Result History**) is shown from;

- **Result History list after terminating AutoCall test**

- **Call Result History in Menu tab**

1. In main screen of
   XCAL-Mobile 4G, tap
   Menu tab.
2. Tap **Call Result
   History**.

3. **Result History** list
   appears.

4. Tap one of AutoCall
   tests, and XCAL-Mobile
   4G shows its details.

5. Only FTP, Throughput
   Info appears when
   tapping test result in
   Detail Info.

 3G , WiFi , LTE icons in **Result History** list shows each call test has been performed in 3G or WiFi or LTE environment.

Uploading Log File

XCAL-Mobile 4G enables you to upload test logging file to a designated FTP server.

When AutoCall test is completed, log files are generated in *.drm and *.csv format as a pair. Logging files in *.csv format help to see results of measurement data on smart phone itself. Logging files are saved in *XCAL-Mobile 4G/Logging* folder.

1. In main screen of XCAL-Mobile 4G.
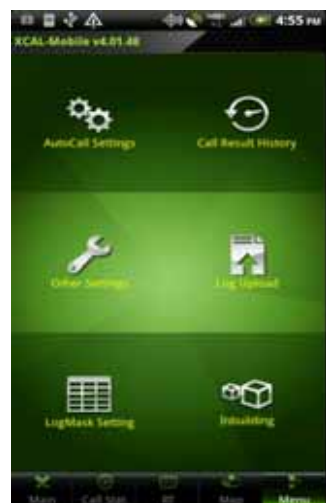
2. Tap **Menu** tab. And Tap **Log Upload** button.

3. **Do you want to turn Wi-Fi on?** Pop-up screen is shown.
   Log Upload function is only available when WiFi is on.

4. A list of logging files is shown.
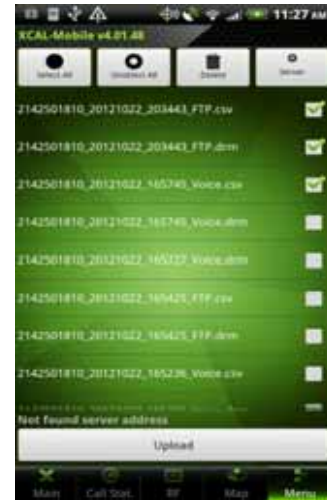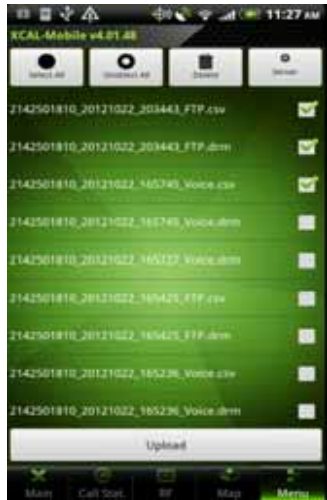
5. User can upload checked logging files to a designated FTP Server.

 : Select all logging files.

 : Unselect all selected files.

 : Delete selected files.

 : Configure FTP Server. For details, see **Uploading Setting**.

 When tapping **Upload** button without configuring Upload setting at the top-right of the screen, **Not Found Server address** is popped up at the bottom of the screen.

6. FTP server configuration screen appears.

7. Configure FTP server to upload logging files.

8. Tap **Save** button.

9. Tap **Back** button

10. Tap **Upload** button. Progress bar is shown.

11. When uploading process is finished, **Upload End (Complete) 100%** message is shown. Tap the screen to return the previous screen.

If you stop while uploading, **End by User** message is shown and uploading process is stopped.

Uploading Setting

XCAL-Mobile enables you to configure uploading options in **Upload Server** screen.

1. Tap **Set** button in **Log Upload** screen.

2. **Upload Server (FTP)** screen appears.

3. Configure FTP options; FTP server address, Port number, user ID/PW, Server Path.

DRM Auto Upload: Uploads log file in *.drm format onto FTP server automatically when AutoCall test is terminated.
E-Mail Notification: Automatically sends message to the configured e-mail address when uploading is completed.

4. Tap **Save** button at the upper right side of **Upload Server (FTP)** screen to complete configuration. Completion pop-up message appears at the bottom of the screen.

Additional Function

XCAL-Mobile 4G provides you with further functions.

- **Manual Logging**

- **Replay**

- **Screen Capture**

- **About (License Return, Help)**

- **Other Settings (Naming Log File, CSV Delimiter, RAT & Band Lock, External GPS)**

Manual Logging

Basically, XCAL-Mobile 4G automatically generates and saves logging file after AutoCall test. It also allows you to manually generate and save logging file, which includes monitoring signal and packets coming from smart phone, without AutoCall test.

If AutoCall test is started during manual logging, XCAL-Mobile 4G stops generating manual logging file, and starts generating AutoCall logging file. XCAL-Mobile gives first priority on AutoCall logging file.

1. Tap **Menu** button on smart phone hardware to pop Replay function. Tap **Logging start** button.

2. When Manual Logging function is on, manual logging running icon is displayed at the upper left corner of screen.

3. Tap **Menu** button on smart phone hardware. Tap **Logging Stop** button to stop manual logging.

4. Manual Logging drm file will be generated on Log Upload Screen.

Manual Logging function runs in background mode. You can use other smart phone features while running Manual Logging function of XCAL-Mobile 4G in background mode.
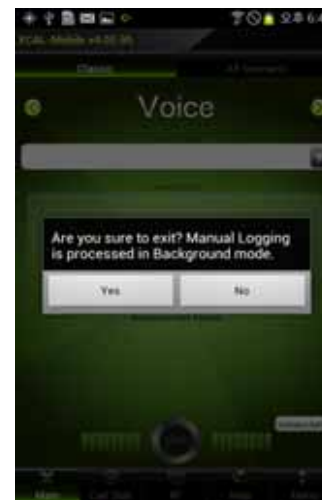
1. When Manual Logging function is on, manual logging running icon is displayed at the upper left corner of screen.

2. Tap **Back** button on smart phone hardware to terminate XCAL-Mobile 4G application. For detail, see **Terminating XCAL-Mobile 4G**.

3. A confirmation pop-up screen appears. Tap **Yes** button.

4. XCAL-Mobile 4G application is terminated, and Manual Logging function runs in background mode.

Replay

Replay function replays existing logging file. RF information of smart phone will be displayed.

Logging files in *drm format are available for Replay function.

1. Tap **Menu** button on smart phone hardware to pop Replay function. Tap **Replay** button.

2. Tap **Add** button.
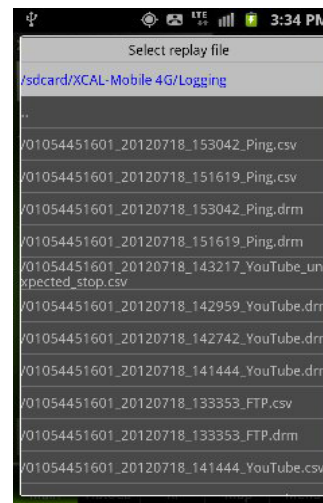
3. A list of logging files is shown. Tap one of logging file to replay.
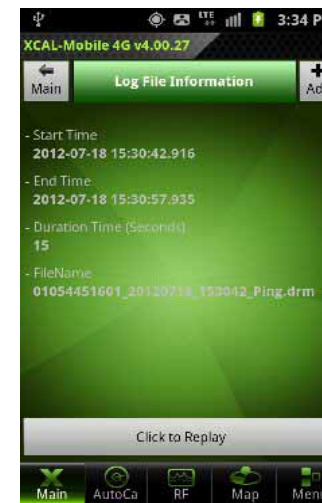
4. Information of selected logging file is displayed. Tap **Click to Replay** button.
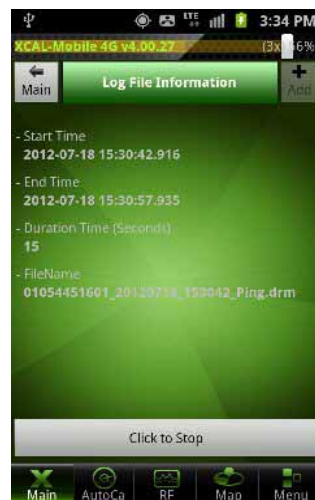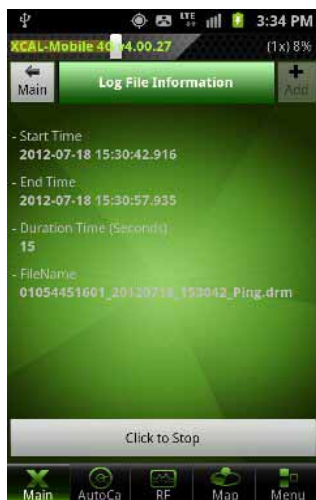
5. Replay status is shown in percentage at the top of Replay screen. Replay is completed showing replay status of 100% at the top of Replay screen.

6. User can set the Replay speed using top of Screen. (1x, 2x, 3x)

Screen Capture

For the easier troubleshooting purpose, Screen Capture function captures the current screen and report message to Accuver along with the captured screen image.

1. Tap **Menu** button on smart phone hardware, and tap **Screen Capture** button.
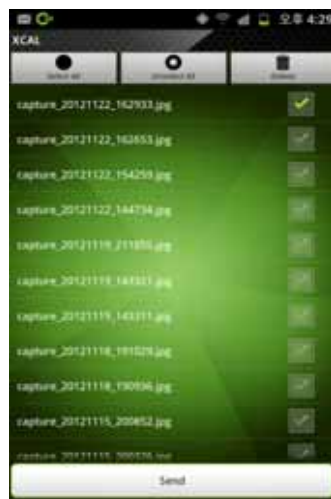
2. Captured image files are listed. Select captured image you want to report error. Tap **Send** button.

3. **My Info Setting** screen appears. Configure your information, and tap **Send to Accuver** button.
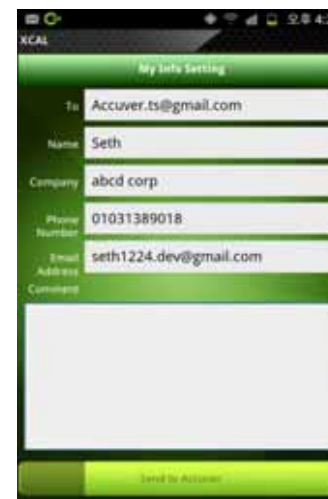
4. Error is reported via e-mail successfully.

About

About screen checks registration status, returns the currently used XCAL-Mobile 4G License, and opens Quick Guide.

About screen shows license type, expiration date, supportable technology, chipset, supportable AutoCall types, and functions.

1. Tap **Menu** button on smart phone hardware to pop About function. Tap **About** button.

2. About screen shows Device Type, License Type, License date information, chipset, supportable AutoCall type, and technologies.

3. To return the currently registered and using license, tap **Return the License** button at the bottom of the screen.

4. Tap **Return the License** button, and confirmation screen pops up. Tap **Yes** button to return License.

5. To open help file, tap **Help** button in **About** screen.

6. Quick Guide of XCAL-Mobile is opening.

7. Swipe up and down the screen to read Quick Guide.

8. To close Quick Guide, tap **Back** button on smart phone hardware.

Quick Guide is not opened during AutoCall test.

Other Settings

Options screen enables you to configure extra options for program starting up operation, logging file, and etc.

To open Options screen, tap **Menu** – **Other Settings** button. Configure options, and tap **Save** button to save setting.

Items	Description
Startup	Configures options related to the program start-up.
	Auto Start: Executes XCAL-Mobile program when powering on the smart phone device.
	Auto Logging: Starts Manual Logging when executing XCAL-Mobile application.
Logging	Configures options related to logging file.
	Packet Capture: Includes Packet Capture data to existing logging file.
	Save to DRM File: Includes packet capture data to *.drm file.
	Save to PCAP File: Includes packet capture data to *.pcap file.
	XCAL Format: Includes Timestamp data to existing log codes.
	Real Time Compress: Compresses logging file (*.drm -> *.drz)
	Path: Designates logging file save path.

(Continue)

(Continue)

Items	Description
Logging	**Naming Log File (Before AutoCall)**: Enables you to configure name of log file before/after AutoCall. For details, see **Other Settings – Naming Log File**. 　　**Naming Log File (Before AutoCall)**: Configures log file name before starting AutoCall. 　　**Naming Log File (After AutoCall)**: Configures log file name when AutoCall test is completed. **CSV Delimiter (Current: Tab)**: For details, see **Other Settings - CSV Delimiter**.
Phone Set Mode	Configures network mode of smart phone device. 　　**Network Mode (DM)**: Tap **Set** button to configure technology, band, and UARFCN/ARFCN of WCDMA/GSM. Network type varies depending on License key type. 　　**RAT/Band Lock (Hidden)**: For Galaxy S3 (Model Name: GT-I9305) only. Configures data network and band for test. For details, see **Other Settings – RAT & Band Lock (Galaxy S3 GT-I9305)**.
GPS	**Ext.GPS**: Connects external GPS for location information. For details, see **Other Settings – External GPS**.
Save	Saves setting.

Other Settings - Naming Log File

XCAL-Mobile application is designed to save log file automatically when AutoCall or Manual Logging test is completed. With Naming Log File option, you may configure name of log file in *.drm format. You can configure before or after AutoCall or Manual Logging test.

1. Tap **Menu – Other Settings**.

2. Tap the checkbox for **Naming Log File (Before/After AutoCall)**.

Naming Log File (Before AutoCall): Configures name of log file (*. drm) before starting AutoCall or Manual Logging test.

Naming Log File (After AutoCall): Configures name of log file (*.drm) after completing AutoCall or Manual Logging test.

3. Log file is saved with the user pre-configured log file name.

Other Settings - CSV Delimiter

XCAL-Mobile application is designed to create paired log files in *drm and *csv format when AutoCall or Manual Logging test is completed. With CSV Delimiter option, you may configure delimiter in *.csv file between comma and tab. Default is set to comma.

1. Tap **Menu** – **Other Settings**.

2. Default is set to Comma.

2. Default is set to Comma. Tap the checkbox for **CSV Delimiter** to change delimiter to Tab.

Examples of *.csv files with delimiter of Comma and Tab.

Other Settings - RAT & Band Lock (Galaxy S3 GT-I9305)

For Galaxy S3 (Model Name: GT-I9305) only which is currently used in EMEA and APAC.

RAT & Band Lock function enables you to configure data network and band for test.

1. Tap **Menu** – **Other Settings**.

2. Tap to select **SET** button for **RAT Lock (hidden)** or **Band Lock (Hidden)**.

3. **SET** button for **RAT Lock** shows **RAT Lock** screen.

3-1. Tap to select the checkboxes of technologies, and tap **SET** button.
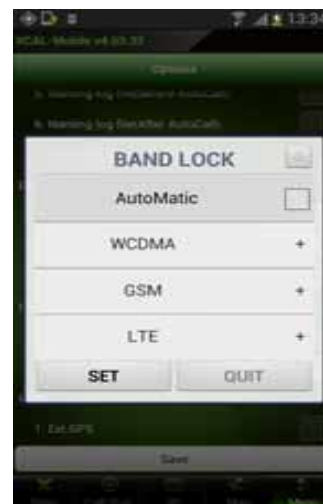
4. **SET** button for **Band Lock (Hidden)** shows **Band Lock** screen. Tap **Conversion** icon at the right side of **Band Lock** to converse to **RAT Lock** screen, and vice versa.

4-1. Tap **+** button to unfold technology bane.

4.2 Tap to select checkboxes of bands, and tap **SET** button.

Other Settings - External GPS

In order to minimize errors during measurement test, external GPS can be connected through Bluetooth function and used for XCAL-Mobile.

1. Tap **Menu** – **Other Settings**.

2. Tap the checkbox for **Ext.GPS**.
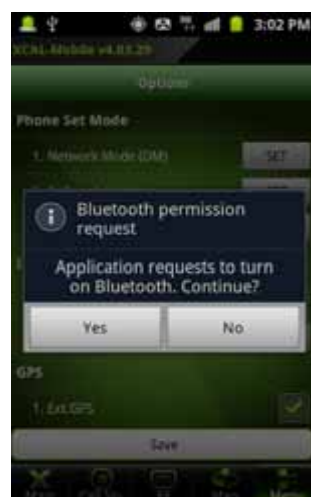
3. When Bluetooth function is not activated, **Bluetooth permission request** pop-up screen appears. Tap **Yes** button.

4. Make sure **Bluetooth enabled** pop-up message appears.

5. Tap **Scan for Device** button to list up paired Bluetooth.

6. Green dot at the right top corner of the screen means external GPS is connected properly. Red dot means external GPS is not connected.

7. Column of GPS Information in RF Information screen displays External GPS.

Inbuilding Test

XCAL-Mobile enables you to perform measurement inside of a building.

- **Configures Inbuilding test.**

- **Starts Inbuilding test.**

    - **Moving Point**: Performs call test while moving inside of a building.

    - **Fixed Point**: Performs call test at a certain measurement point inside of a building.

Configuring Inbuilding test

Before starting Inbuilding test, configure Inbuilding test.
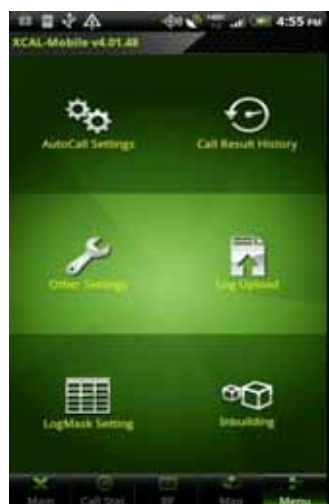
1. In main screen of
   XCAL-Mobile, tap **Menu**
   tab.
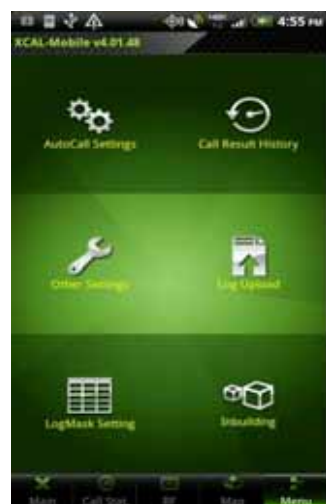
2. Tap **Inbuilding**.

3. **Inbuilding List**
   screen appears.
   Tap **Add** button.

4. **Inbuilding Setting**
   screen appears.
   Enter a building name
   in **Building** entry
   field.

5. Tap **Floor** button, and swipe up and down to select floors.

6. Tap **Upper/Under** button.
   The left section designates ground floors and above ground floors. The right section numbers starting with **B** designates basement floors.

7. Swipe up and down to select floors and Tap **Done** button.

8. Tap **Get GPS** button.
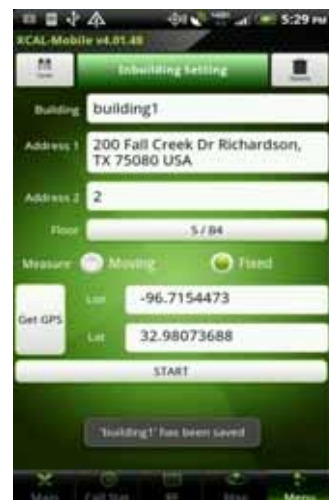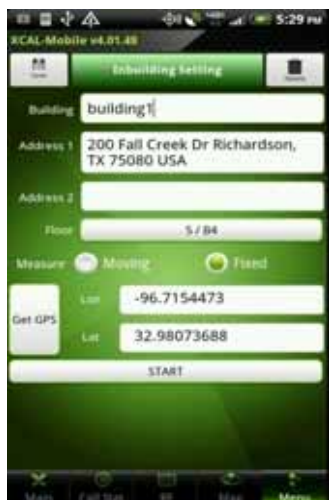
8. Select a measurement type between **Moving** and **Fixed**.
   Moving: Performs call test while moving inside of a building. For detail, see **Moving Point Test**.
   Fixed: Performs call test at a certain measurement point inside of a building. For detail, see **Fixed Point Test**.

9. Tap **Get GPS** button to configure current GPS information (or enter longitude and latitude data in **Lon** and **Lat** entry field). **Address1** will automatically be filled up with address of current location as it is suggested by Google Map Search.

10. Enter an Address in **Address 2** entry field.

11. Tap **Save** button to save Inbuilding configuration, and tap **START** button.

12. Inbuilding – Fixed/Moving Screen appears.

Starting Inbuilding Test

Indoor measurements can be accommodated in with AutoCall feature.

After completing configuration of Inbuilding test, you may start Inbuilding test. Following procedure instructs how to start Inbuilding test.
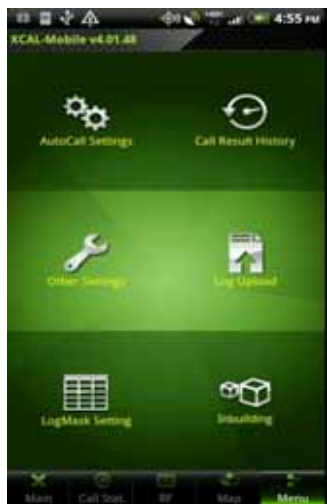
1. In main screen of XCAL-Mobile, tap **Menu** tab.
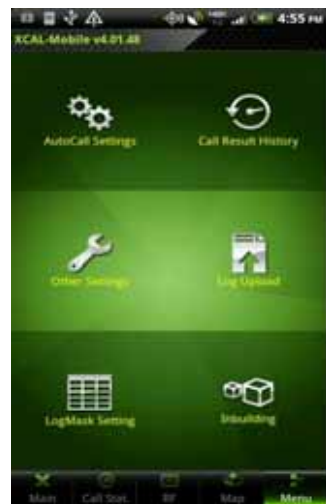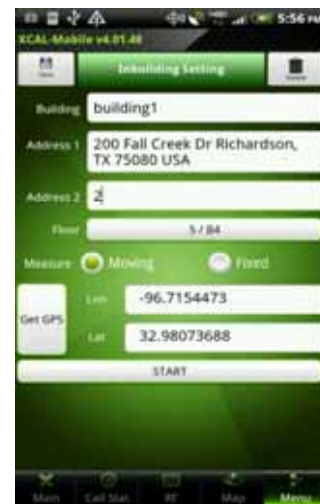
2. Tap **Inbuilding**.

3. Tap **START** button to start Inbuilding test.

Moving Point Test

By selecting **Moving** type for Inbuilding, XCAL-Mobile will perform measurements while moving among points inside of a building.

The following procedure describes the process to follow after tapping the **START** button to start Inbuilding test.
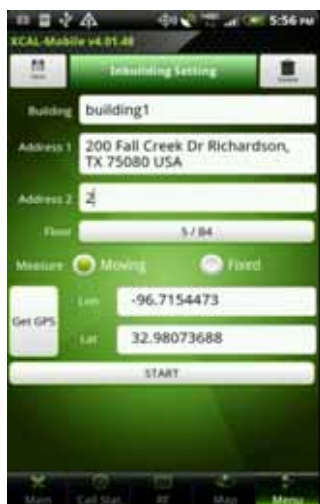
1. Tap **START** button to start Inbuilding test.

2. **Inbuilding – Moving** screen appears.

3. Tap the combo box for **Call Name** to select call scenario.

4. Select floor.

5. Select building image file.

    Select Image:
    Selects existing image
    file inside of smart
    phone.
    Take Photo: Takes photo.

6. Selected image file is
    shown.

7. Pinch open and out to
    zoom in and out of the
    image.

8. Tap a starting point on
    the image (floor map) to
    perform AutoCall test,
    and tap **Yes** to confirm
    this point is starting
    point.
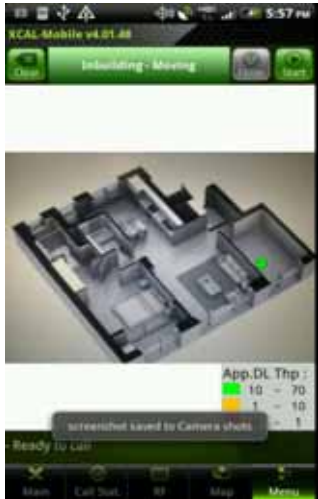
9. XCAL-Mobile is ready to start Inbuilding test (with AutoCall), and **Start** button is activated.
Tap **Start** button, AutoCall test will begin. Move to the second point.

10. Inbuilding test is started, and its status is displayed at the lower left side of screen. Call measurement screen is shown for a few seconds and will return to Inbuilding image screen.

11. When you are arriving at the second point, tap the second point on image. Tap **Yes** button to confirm.

12. Configured parameters are shown on the image.
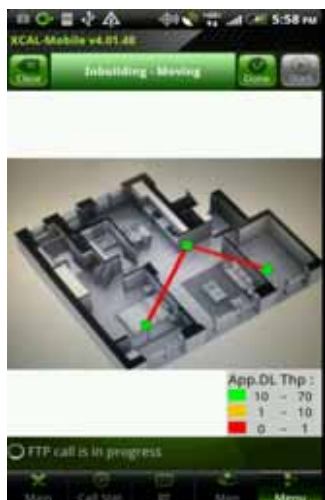
13. Tap the third point.
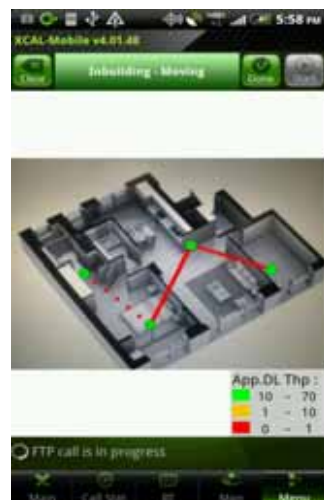
14. Then, start to move to the third point. Continue the same processes for following points.

15. Tap **Menu** button on smart phone hardware to activate settings.
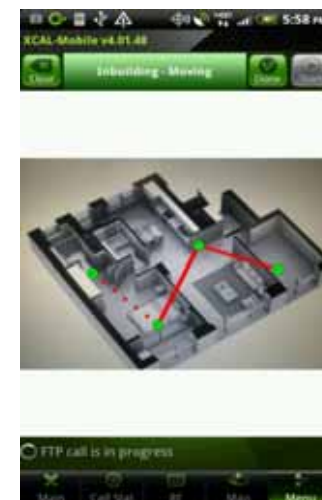
16. Tap **Legend Off** button to hide legend in the image.
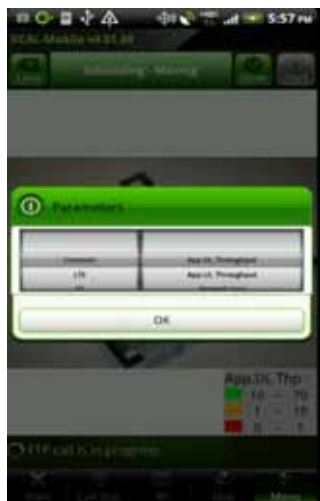
17. Tap **Parameters** button to open parameters setting screen. Parameters are categorized by **Common**, **LTE**, **3G**, **2G**, **CDMA**, and **EVDO**.

18. Configure parameter.
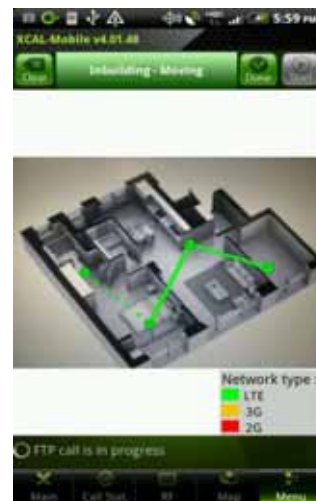
19. Selected parameter is shown in image.
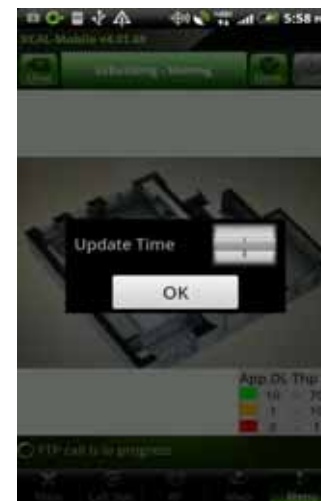
20. Tap **Settings** button to configure Update Time to apply parameter values.
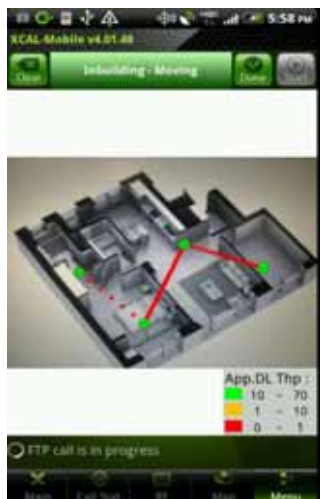
21. Tap **Done** button to terminate test.
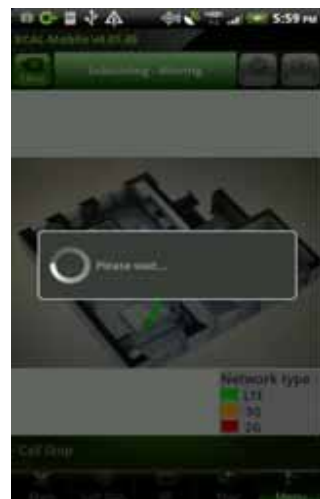
22. When AutoCall is finished based on scenario, call test is automatically terminated.
23. Inbuilding test is completed, and **Clear** button is activated. To remove points, tap **Clear** button.

When Inbuilding test starts, **Done** button is activated. Selecting **Done** button will terminate/stop AutoCall test and Inbuilding test which is running.

Fixed Point Test

By selecting **Fixed** XCAL-Mobile will perform measurements at a measurement point location inside of a building.

The following procedure describes the process beginning with the **START** button to start the Inbuilding measurements:
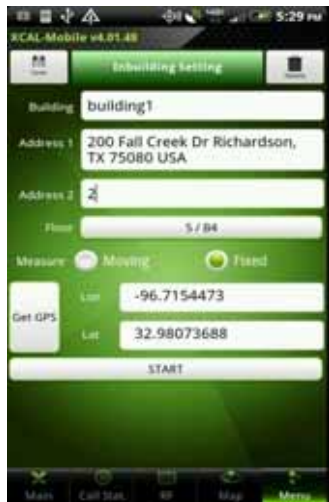
1. Tap **START** button to start Inbuilding test, and **Inbuilding – Fixed** screen appears.

2. Tap the combo box for **Call Name** to select call scenario.

3. Select building image file.

   Select Image: Selects existing image file inside of smart phone.
   Take Photo: Takes photo.

4. Selected image file is shown.
   Select a certain point on image to measure, and tap **Yes** button to confirm the selected point is at the correct location.

5. XCAL-Mobile is ready to start Inbuilding test, and **Start** button is activated.
    Tap **Start** button.

6. Inbuilding test for **Fixed** type is started.

7. When AutoCall is finished based on scenario, call test is terminated automatically.
    Or, to stop call test manually, tap **DONE** button.

8. Inbuilding test at a fixed point is terminated, and **Clear** button is activated. To perform more tests at fixed points, tap **Clear** button, and repeat steps 4 - 8.

Configuring Inbuilding Options

XCAL-Mobile enables you to change Inbuilding map setting in Inbuilding screen. To open Inbuilding Options, tap **Menu** button on smart phone hardware.
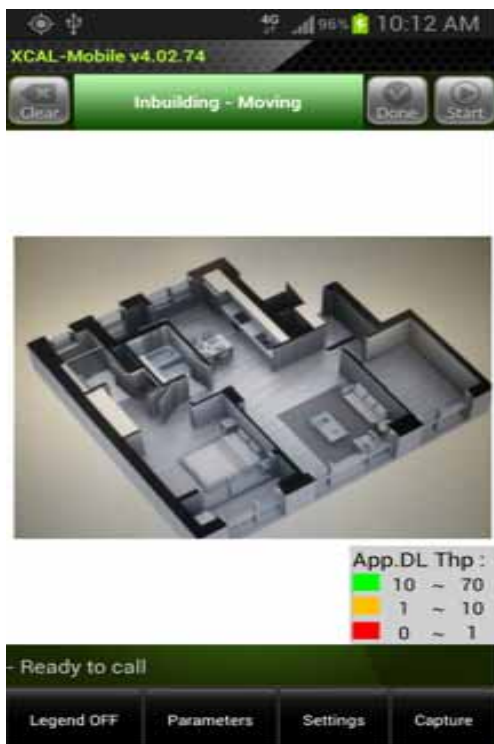
Items	Description
Legend On/Off	Shows/Hides legend in map.
Parameter	Selects parameters of technologies to display in Inbuilding. For details, see **Configuring Inbuilding Options – Parameters**.
Settings	Configures data update time in Inbuilding screen.
Capture	Screen Capture

Configuring Inbuilding Options – Parameters

Parameters button in Inbuilding Options menu selects parameters of technologies to display in Inbuilding.

Tap **Parameters** button, and Parameters pop-up screen appears. Select technology and corresponding parameter you want to display on the Inbuilding.

Items	Description
Common	App. DL Throughput /APP. UL Throughput
	Network Type
LTE	RSSI / RSRP
	RSRQ /SINR
3G	Rx Power / Tx Power
	SIR
	Best Active Set Ec/Io
	Best Active Set RSCP
2G	Rx power
	Rx Qual(Full) / Rx Qual(Sub)
	TA, RLT
CDMA	Rx Power / Tx Power
	Ec/Io
EVDO	Rx Power / Tx Power
	Ec/Io, SINR

Terminating XCAL-Mobile 4G

When you have completed all necessary measurement test with XCAL-Mobile 4G or you want to terminate the application while measurement, you can terminate the application.

During AutoCall test, XCAL-Mobile 4G applciation cannot be terminated. Stop AutoCall test first by tapping **AUTOCALL STOP** button in AutoCall test screen, and terminate the application. For details of how to terminate AutoCall test, see **Terminating AutoCall Test**.

Press **Home** button on smart phone hardware, and XCAL-Mobile 4G application runs in background mode.

1. When you want to terminate XCAL-Mobile 4G application, tap **Back** button on smart phone hardware.
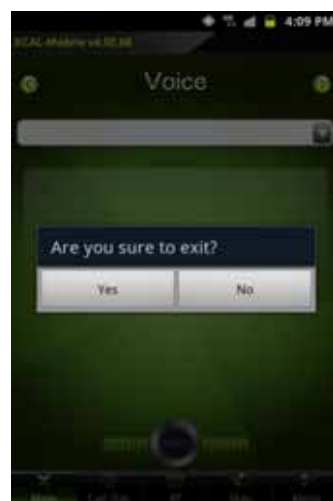
2. Exit configuration pop-up screen appears. Tap **Yes** button.

3. XCAL-Mobile 4G application is terminated.

Troubleshooting

While using XCAL-Mobile, the program pops up a troubleshooting alarm screen when the program is terminated compulsively or by anonymous errors and lauched again. You may report error to Accuver Technical Support team directly.

Error report is sent to Technical Support team via an e-mail automatically.
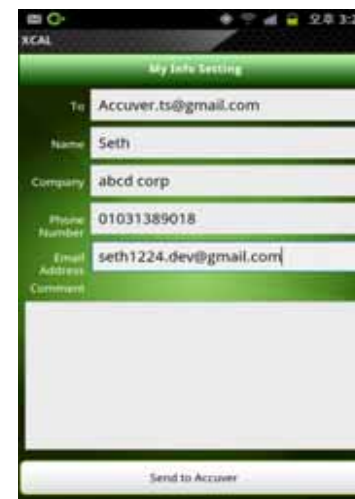
1. When you execute XCAL-Mobile after the program has been terminated compulsively or by anonymous errors, an alarm screen pops up.

2. Tap **Send Error Report** button to report error to Accuver Technical Support team.

    Don't Send: Ignores the alarm screen, and do not show the alarm screen again.
    Later: Shows the alarm screen next time you execute XCAL-Mobile.

3. **My Info Setting** screen appears. Configure user information.

4. Tap **Send to Accuver** button to report the error via an e-mail automatically.

Related Products

XCAL-Mobile is compatible with Accuver's other server-based solution series below.

XCAL-Auto is an autonomous total measurement and monitoring solution with web-based centralized management. Simply by installing XCAL-Auto in any vehicles, XCAL-Auto automatically collects data over the air and its central server controls remote-units and status information.

XCAP Vuze is a web-based total integrated platform that post-processes log files and provides engineers with a high level KPI and call failure view of the network via web client access. It also supports automatic reporting, automatic diagnostics of call failures, data export, download of log files, and etc.

Appendix: **Configuring AutoCall Scenario**

XCAL-Mobile 4G supports the following AutoCall types; Voice, FTP, Web, SMS, WiFi, E-Mail, Ping, and YouTube.

Time Configuration (Voice, Web, SMS, WiFi, E-Mail, Ping, YouTube)

Following displays items commonly configured for voice call tests.

Enter a call name in the entry field.

Maximum time period to sustain connection calls

Time interval between calls. Enter higher value than Idle Time + Setup Time + Traffic Time

Number of call attempts to repeat

Maximum time to setup radio link connection

Time period to wait to start a new call after ending a call

None: Idle – T.Setup(Log in) - Traffic

Airplane Mode: Idle (Airplane **ON**) – Setup (Airplane **Off**) – T.Setup(Log in) – Traffic

Time Configuration (FTP)

Followings displays items commonly configured for data call tests.

Enter a call name in the entry field.

Time to complete task.

Number of call attempts to repeat.

Time period to log in FTP Server

Maximum time to setup network connection for a call. (Time Period to connect to data service)

Time period to wait to start a new call after ending a call. (Time Period to change Flight Mode)

None: Idle – T.Setup (Log in) - Traffic

Airplane Mode: Idle (Airplane **ON**) – Setup (Airplane **Off**) – T.Setup (Log in) – Traffic

Configuration for Each Call Type

Followings are configuration options for each call type.

Voice

- Voice Type:
  1) Ori : Call Send Test
  2) Ter : Call Receive Test
  3) Con : Continuous Call Test
     (Traffic Time unlimited)
- Dial Number: Phone Number

When tapping HW Menu button and tapping Speaker On button, you can use speakerphone function while processing Voice AutoCall test.

For details of MOS Setting in Voice, see **MOS Setting** configuration.

FTP

- FTP:
  1) Down: Download data
  2) Up: Upload data
- Passive Mode: FTP Server Option
- FTP IP Address: Targeting URL
- FTP User ID: FTP Server Setting
- FTP Password: FTP Server Setting
- FTP Server Path: FTP Folder Full Name Setting(Down/Up)
- FTP File Name: Name of the original file to be downloaded from server (For Download test) Kilo(k) & Mega(m) Unit Support: ex) 100k, 230k, 2m, 10m, ... (For Upload test)
- Pending: If select Pending ON
  1) Interval: Set max time limitation that allows pending conditions
  2) Threshold: Set data throughput limitation that allows pending conditions
- File duplicate:
  1) Overwrite :
  2) Delete :

Web

- Web Type:
  1)Browsing : Web Browsing Test
  2)HTTP Download : Web
  Downloading Test
  3)HTTP Upload : Web Uploading
  Test
- Default Time out: Web Test End
  Event Delay Option(Default : 2
  second)
- URL: Input scenario name and
  URL address in entry field

SMS
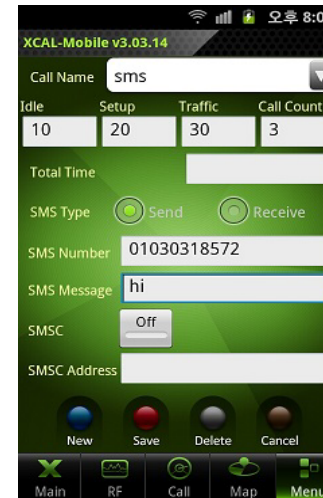
- SMS Type: Send/Receive
- SMS Number: Phone Number
- SMS Message: Input SMS Text
- SMSC On/Off: network element
  in the mobile telephone network
  which delivers SMS messages
- SMSC Address: short message
  service center address

  Not Currently Supported

WiFi

WiFi test connects and disconnects to a certain WiFi AP.

- SSID: Target SSID select
- Security Type: Select Security Type of Target SSID
- Password: Input Password of Target SSID

Not Currently Supported

E-Mail
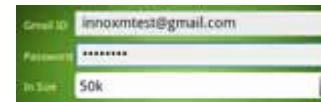
- Gmail ID: Input the Google Gmail Account
- Password: Input Gmail Password
- In Size: Select a text size (50k, 100k, 300k, 500k, 1m)

Available only with E-Mail sending.

Ping

- Destination: Input IP address or URL of ping test destination
- Count: Input ICMP request count
- TTL: Input Time To Live (1 – 255)
- Packet size: Input size of data bytes to be transmitted
- Interval: Input ICMP request interval (second unit)
- Success Rate:
  Test Success
  Setting Value > Fail Rate
  Test Fail
  Setting Value < Fail Rate

  Fail Rate=[(Ping Count – Proceeded Count) + Fail of Proceeded count] / Ping Count

Iperf

Iperf test computes capacity of packet network performance.

Destination: Inputs IP address or URL of ping test destination
Port: Configures Port number.
Mode: Selects between TCP and UDP.
Direction: Selects between Up and Down.
- Up: Transfers packet from smart phone (client) to server.
- Down: Transfers packet from server (client) to smart phone.
Packet Size (bytes): Activated when UDP is selected for Mode.
Max Seq.Size (bytes):Activated when TCP is selected for Mode.
Window Size (KB): Buffer Size (1~1024000)
UDP Throughput (Kbit/sec): Activated when UDP is selected for Mode. (1~1024000)
Remote Control: PC connects with Daemon Tool

Youtube

- Youtube setting: Select Youtube Content in Youtube website.

   When you select a Youtube contents, setting options including Title, Duration, are configured automatically.

- Title: Youtube Content Title
- Duration: Youtube Content duration Info
- Pending:
  1) Interval : Set max time limitation that allows pending conditions
  2) Threshold : Set data throughput limitation that allows pending conditions

VoLTE

- Voice Type:
  1)Ori : Call Send Test
  2)Ter : Call Receive Test
  3)Con : Continuous Call Test in Origination (Traffic Time unlimited)
- Dial Number : Phone Number
- RTP TIMEOUT: Drop is pegged when none of RTP packets are received during the RTP TIMEOUT(second) set by user
- Video Call
  1)On: Video VoLTE Call
  2)Off: Voice VoLTE Call

 When tapping HW Menu button and tapping Speaker On button, you can use speakerphone function while processing VoLTE AutoCall test.

 For details of MOS Setting in Voice, see **MOS Setting** configuration.

While processing MOS call test, MOS values in progress can be monitored in the screen by tapping MOS screen.

MOS Setting

MOS Setting is in Voice and VoLTE. Tap MOS Setting On/Off button to activate/inactivate MOS configuration items.

- Measurement Type:
  - When XCAL-Solo HW is connected,
    Simplex (Down): Recording only
    Simply (Up): Play only
    TimeSync Half-Duplex: Play and record.
  - When XCAL-Solo HW is NOT connected,
    Simplex (Down): Recording only
- Calculation:
  None (Recording Only):

Recording
POLQA MOS (P.863): POLQA MOS value calculation after recording (Appearing only when there is POLQA license.)

- Original File: Original sound source (Reference file).
- Play File: Sound source to be played.
- Save Wave Stream: Saves sound
- source in *.wav format after recording (For MOS value calculation).
- Automatic Level Alignment: Adjusts volume level of recording file automatically (OPTICOM option).
- Solo H/W: Selects when XCAL-Solo HW is connected to Smart Phone.

[XCAL-Solo]

XCAL-Solo HW is connected to smart phone for POLQA test and sound source play while processing MOS test. It charges smart phone battery.

[HW Specification]

Operating Power
Operating Voltage: 4.2v (Internal Battery), 5.0v (External USB)
Current Consumption: 300mA @4.2V (Stand-by)

Bluetooth: BT 2.1 EDR
Wi-Fi: 802.11 b/g/n
Phone Interface: USB2.0 (micro USB connector) x 1
Audio In/Out (3.5mm stereo jack) x 1
Battery: Internal battery(1850mAh)
Memory Slot: Micro SD card slot x 1
Size: 95 x 65 x 10 mm
Weight: 85g

[Status Icons]
When XCAL-Solo HW is connected to smart phone, status icon appears at the upper right corner of XCAL-Mobile application screen.
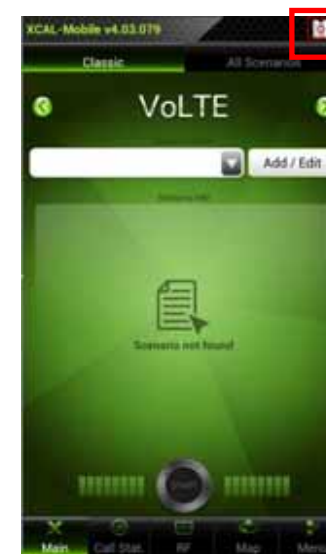
: Charging

: Fully charged

: Charged less than 75%

: Charged less than 50%

: Charged less than 25%

: XCAL-Solo HW is not connected.

[POLQA TEST]
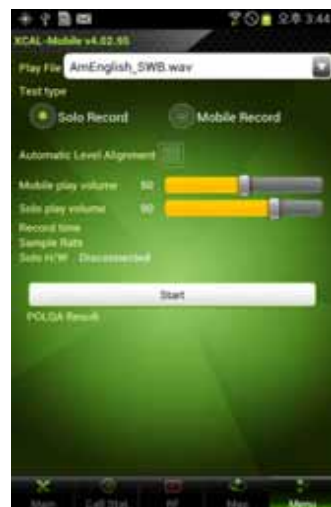
POLQA TEST button appears when selecting Solo HW button is selected. POLQA test verifies condition and status of ear jack to be used for MOS test in Voice and VoLTE.

- Play File: Sound source to be played
- Test Type:
  Solo Record: XCAL-Solo records and transfers sound source.
  Mobile Record: Smart Phone records.
- Automatic Level Alignment: Adjusts volume level of recording file automatically (OPTICOM option).
- Mobile Play Volume: Adjusts Smart Phone HW volume.
- Solo Play Volume: Adjusts XCAL-Solo HW volume.
- Record Time: Shows recording time.
- Sample Rate: Shows recording sample rate.
- Solo HW: Shows connection status of XCAL-Solo HW.
- Start/Stop button: Starts/Stops POLQA test.

POLQA test is shown in the same screen.

POLQA test is available only when XCAL-Solo HW is connected to Smart Phone.

Once POLQA Test is done, *.wav file is created and saved in **XCAL-Mobile** – **MOS Data** folder while creating and saving existing logging files (*.drm and *.csv).

Multi Call

Multi Call enables you to perform test based on multiple call scenarios sequentially.

a. Tap scenario combo box to select scenarios sequentially, and the selected call scenarios are listed.
b. Tap to select checkboxes of call scenario you want to include and process multi call.
c. Configure **Repeat Count** of call test.
d. Tap **Save** button.
e. Tap **Start** button to start automated Multi Call test.

Multi RAB

Multi RAB performs concurrent voice and data call test.

Sync: Processes next call when one session (voice + data call) is terminated.
Async: Processes voice and data call individually.

Tap to select call scenario combo box to include call scenario in Multi RAB test.

Appendix: Call Events

XCAL-Mobile 4G provides test result with call events by call types depending on AutoCall types.

Voice

Events	Description
Setup Fail	Setup fail occurs when radio link setup failure happens.
Drop	Call drop during progress of traffic
Idle	* CDMA : Fail to receive general page message * WCDMA : Fail to receive rrc Connection Request message

FTP

Events	Description
Traffic Fail	Traffic fail is declared if connection to application layer fails after finishing PPP layer connection. *This event is available for data service such as FTP, TFTP and HTTP
Pending	If throughput is sustained under predefined threshold for designated time threshold, then pending is declared and the call will be dropped *This event is available for FTP
Time Out	If download or upload from/to application cannot be finished during predefined traffic time interval, Time Out is declared. *This parameter is available for FTP

Web

Events	Description
Traffic Fail	Traffic fail is declared if connection to application layer fails after finishing PPP layer connection.
Page Connect Fail	Page Connect Fail is declared when a wrong web site address is configured.
Pending	If throughput is sustained under predefined threshold for designated time threshold, then pending is declared and the call will be dropped.
Time Out	If download or upload from/to application cannot be finished during predefined traffic time interval, Time Out is declared.
Error	Number of calls with various errors such as No ATDT, modem Error and port error. These errors are related to test phone.

SMS

Events	Description
Idle	* CDMA : Fail to receive general page message * WCDMA : Fail to receive rrc Connection Request message

WiFi

Events	Description
Setup Fail	Setup Fail is declared when wrong password is configured.
Fail	Fail is declared when wrong security type is configured.
Traffic fail	

E-Mail

Events	Description
Authentication Fail	Authentication Fail is declared when wrong E-Mail ID or Password is entered.
Time Out	If download or upload from/to application cannot be finished during predefined traffic time interval, then Time Out is declared.

Ping

Events	Description
Fail	Fail is declared when wrong IP and URL are configured.
Error	Number of calls with various errors such as No ATDT, modem Error and port error. These errors are related to test phone.

YouTube

Events	Description
Time Out	If download or upload from/to application cannot be finished during predefined traffic time interval, Time Out is declared.
Pending	If throughput is sustained under predefined threshold for designated time threshold, then pending is declared and the call will be dropped.

VoLTE

Events	Description
Setup Fail	Setup Fail is declared when API message: CallEstablished is not received until Setup Time is completed.
Drop	Drop is declared when API Call Ended is received between Traffic Start and Traffic Time ends

Appendix: Parameter Description

Detailed descriptions of parameters for each technology are listed.

LTE

Parameter	Description
RSSI	Received Signal Strength indication measured
Tx power	Transmitted power of the device
PCI(Serving)	Physical Cell Identity of the serving cell
RSRP(Serving)	Reference Signal Received Power for the

Parameter	Description
	serving cell(dBm)
RSRQ(Serving)	Reference Signal Received Quality for the serving cell(dB)
SINR(Ant0/Ant1)	Signal to Interference and Noise ratio for the

Parameter	Description	Parameter	Description
	serving cell(dB)	MNC	Mobile Network Code
CQI(CW0/CW1)	Channel Quality Indicator of CW0 and CW1	EARFCN(DL/UL)	Channel number and Frequency(MHz) the device is selecting
Rank Index	Rank Indicator		
RB Num(DL/UL)	Resource Block number assigned in DL and UL	Bandwidth(DL/UL)	Bandwidth assigned(MHz)
	Modulation Index and Percentages of	Band Indicator	Band Indicator in LTE
MCS(DL/UL)	Modulation schemes	Tracking Area Code	Tracking Area Code which the current eNB belongs to
	assigned(QPSK/16QAM/64QAM)		
PDSCH BLER	Block Error Rate for PDSCH channel (%)	Cell ID(Serving)	E-UTRAN Cell Identifier for the serving cell
PUSCH BLER	Block Error Rate for PUSCH channel (%)	Allowed Access	Allowed Access on the cell based on network select mode Indicated by NAS
PDSCH Throughput	Throughput measured in PDSCH channel(Kbps)		
		EMM State	Current EPS Mobility Management State
PUSCH Throughput	Throughput measured in PUSCH channel(Kbps)	EMM Substate	Current EPS Mobility Management Substate
		Transmission Mode (DL/UL)	Transmission mode in DL and UL
Path Loss	Downlink path loss computed in the device		
Wideband PMI	Wideband Precoding Matrix Indicator	Num of Antenna(Tx/Rx)	Number of antenna being used currently
MCC	Mobile Country Code		

3G – UMTS/HSDPA/HSUPA

Parameter	Description
RRC State	Connection status of Radio Resource Control
UARFCN(DL/UL)	UTRA Absolute RF Channel Number
Rx Power	Received signal strength of test phone.
Tx Power	Transmit power of test phone.
BLER	Block Error Rate
SIR	Signal to Interference Ratio in dB unit.
Best Active PSC	Best Active PSC(Primary scrambling code)
Best Active Ec/Io	Best Active Ec/Io(dB unit)
Best Active RSCP	Best Active RSCP(Received signal code power)
CQI	Channel Quality Indicator
DTX Rate	Rate of Discontinuous Transmission
MAC-hs Th.	Throughput(kbps) measured in MAC-hs Layer
Served Physical Th.	Throughput(kbps) measured in Physical Layer *It is throughput which users receive in real time
Scheduled Physical Th.	Throughput(kbps) measured in Physical Layer *It is the throughput of system scheduled to users
No. of	Number of multi-codes measured in a certain

Parameter	Description
Codes(Included)	amount of time
RG(Down/Hold/Up)	Down, Hold, Up for Related Grant Combined serving RGCH determining the serving grant for the transport block sent in this subframe
AG	Absolute grant value; range – 0..31
SG	serving grant index based on AGCH and RGCH; range – 0..37
TTI	time transmission interval 0 – 2 ms TTI 1 – 10 ms TTI
E-TFCI	Range 0 ~ 127
UE Power Headroom	UE Power Headroom(UPH) Ratio of the maximum UE transmission power and the corresponding DPCCH code power
SF Code	Spreading factor and number of codes
Non Serving Cell ACK	Rate of ACK in Non Serving Cell ACK_NS(%) = #of ACK_NS / (# of ACK+# of NAK+# of ACK_NS)

Parameter	Description
Happy Bit	Indicates the value of the happy bit (0 = unhappy, 1 = happy)

2G – GSM/GPRS/EDGE

Parameter	Description	Parameter	Description
BSIC(NCC/BCC)	Base station identity code, BSIC = NCC + BCC	Rx Quality(Full/Sub)	Rx Quality Full: Service signal Quality measured over a full set of TCH and SACCH frames
Cell ID	Cell Identity Number of Serving Cell		Rx Quality Sub: Service signal Quality measured over a sub set of 4 SACCH and SID frames
BCCH ARFCN	Channel information of GSM neighbor cell having the strongest signal strength among neighboring cells		
TCH ARFCN	Traffic Channel – Absolute Radio Frequency Channel Number	Rx Level(Full/Sub)	Strength of the signal in the GSM technology. Range: -55 to -110
Rx Power	Received signal strength(Full, Sub, Serving) of test phone.	RLT Counter	Current value of the radio link timeout counter
Tx Power	Transmit power of test phone.	DS Counter	Current value of the downlink signaling counter
Timing Advance	Timing Advance Value being used during a call.	AMR Rate	Frame type information of downlink and

Parameter	Description
DL/UL(Mode)	uplink voice frames for AMR vocoder
MAIO	Mobile allocation index offset (valid if HOPPING_FLAG is true)
Timeslot number	Timeslot number
HSN	Hopping sequence number (valid if HOPPING_FLAG is true)
Hoping CH List	Channel list for hopping
Coding Scheme (DL/UL)	DL: GPRS encoding scheme used UL: Modulation and coding scheme

Parameter	Description
TS Count(DL/UL)	DL/UL 0, 1, 2, 3, or 4 timeslots
Derived C	Normalized received signal level at the MS
GMSK BEP (Mean/CV)	MEAN_BEP for GMSK (value range 0~31) CV_BEP for GMSK (value range 0~7)
8PSK BEP(Mean/CV)	MEAN_BEP for 8PSK (value range 0~31) CV_BEP for 8PSK (value range 0~7)
MAC C	MAC C-value
C1	C1 value for the cell
C2	C2 value for the cell

2G – CDMA/EVDO

Parameter	Description
Rx Power	Received power of test phone on a scale of 20 dBm to -120 dBm
Tx Power	Transmitted power of test phone on a scale of 40 dBm to -100 dBm
PN	PN offset of the sector on which the fingers are placed

Parameter	Description
Ec/Io	Signal strength of PNs in decibels, representing the energy per chip over noise
State	Call processing main state
Channel	Set of channels transmitted between the base station and the mobile stations within a given CDMA frequency assignment

Parameter	Description		Parameter	Description
Band Class	A set of frequency channels and a numbering scheme for these channels			allocation request from mobile station
P Rev	Highest available protocol revision for the base station		**DSC Value**	Graphical representation of 1xEV DSC Value transmitted by the AT
SID	System Identification number.		**Air Link State**	ALMP State information
NID	Network Identification number		**Session State**	Summary of session layer states
SINR	Signal to Interference and Noise ratio for the serving cell(dB)		**Color Code**	Color code corresponding to the sector
			UATI	Unicast Access Terminal Identifier info
DRC Rate	Graphical representation of forward data rate			

Appendix: RTP Analysis in VoLTE

Audio and Video stream are sent through RTP protocol.
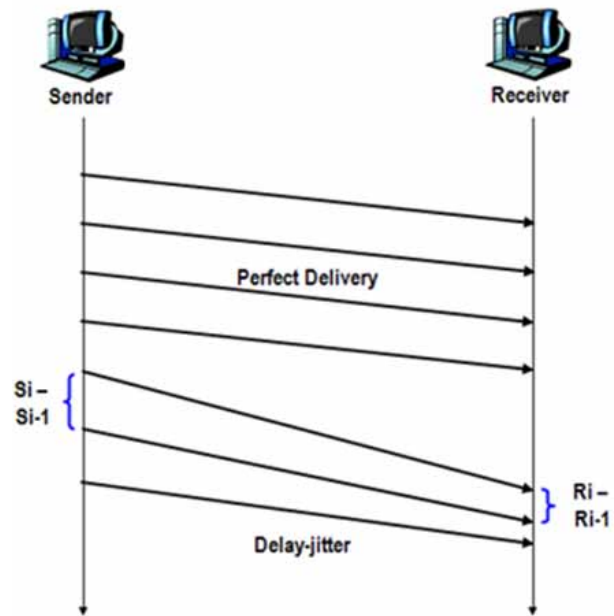
The following items will be calculated by decoding RTP packets and calculating the methods mentioned. They will calculate every packet received and display every second in XCAL-Mobile.

RTP Related KPI	Description
Rx Delay	Time difference of RTP timestamps from previous RTP packet and current RTP packet Rx Delay = R(i) − R(i-1)
Inter Arrival time Difference	It is the time difference in relative transit time expressed as D(i, j) = {R(i) − R(i-1)} − {S(j) − S(i-1)} Here, S(j) is the RTP timestamp from packet j sent and R(i) is the RTP timestamp from packet i received
Inter-Arrival Jitter	It is calculated over packets that arrived consecutively as follows. If J(i) represents the Inter-Arrival Jitter for packet, i and D (i − 1, i) represents Inter-Arrival Time Difference between consecutive packets, i − 1 and i, then Inter-Arrival Jitter is calculated as, Jitter value for the first packet is considered zero. It is calculated at every packet and averaged over one second.
Loss Packet	The number of packets lost. RTP Sequence Number helps detect packet losses.

RTP Related KPI	Description
Packet Loss Rate	It is calculated as, $$\frac{No.\ of\ Pakcets\ Lost}{No.\ of\ Packets\ Received\ +\ No.\ of\ Packets\ Lost}\ x\ 100\%$$ It is calculated at every second
RTP Throughput	Over DL, the throughput is measured as, It is calculated at every second.

FCC Statement:

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA market, only channel 1~11 can be operated and these channel assignments deal with only the 2.4 GHz range.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

Regional offices

Hong Kong (Head Office)

Accuver APAC
Unit 205, 2/F, No. 8 Science
Park West Avenue
Hong Kong Science Park
Shatin, NT, HONG KONG

Tel: +852 2210 7004
Fax: +852 4410 7017

Email enquiries:
sales.apac@accuver.com
support.apac@accuver.com

www.accuver.com

United Kingdom

Accuver EMEA
Suite Two I/F
Congress House
14 Lyon Road, Harrow
Middlesex, HA1 2EN

Tel: +44 20 8863 1118
Fax: +44 20 8863 1638

Email enquiries:
sales.emea@accuver.com
support.emea@accuver.com

www.accuver.com

Japan

Accuver Japan
6F- A11
(Akasaka Twin Tower)
Main Tower 2-17-22
Akasaka, Minato-ku
Tokyo, 107-0052 Japan

Tel: +81 3 5545 8031

Email enquiries:
sales@accuver.jp

www.accuver.com

Korea

Innowireless Co Ltd
2/F, First-Building
PanGyo-Sevenventurevalley
2-development, 633
Sampyeoung-Dong
Bundang-Gu, Seongnam-Si
Gyeounggi-Do, 463-400
KOREA

Tel: +82 31 788 1700

Email enquiries:
sales@accuver.com

www.innowireless.co.kr

USA

Accuver Americas
500 N. Central Expressway
Suite 210 Plano
TX, 75074, USA

Tel: +1 469 241 6100
Fax: +1 469 241 6199

Email enquiries:
sales.usa@accuver.com
support.usa@accuver.com

www.accuver.com