



ACQUA

Establish 4G and 2G/3G Connections to *labCORE* via
Anritsu MD8475B

Application Note

Establish 4G and 2G/3G Connections to *lab*CORE via Anritsu MD8475B

Revision 2

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1 Introduction

1.1 Brief Description

This application note approaches the connection establishment between the Anritsu Signaling Tester MD8475B, HEAD acoustics equipment, and the DUT. The presented configurations intend testing mobile devices with current mobile communication standards (LTE, 3G, 2G).

The document consists of three main chapters. One for the LTE (4G) connection and two others for 2G or 3G connection. The structure of the main chapters is similar. The first sub-chapter illustrates the interconnection of all necessary hardware. Afterwards, the next sub-chapter guides step by step through the procedure for a successful connection establishment.

The application requires an advanced user knowledge of HEAD acoustics equipment as well as Anritsu MD8475B. HEAD acoustics will not respond to support requests concerning general handling and technical configuration of Anritsu MD8475B.

1.2 Reference Documentation

Document name
<i>lab</i> CORE Manual
HMS II Manual
ACQUA Online Help
Anritsu MD8475B User Manual

1.3 Acronyms and Abbreviations

Acronym / Abbreviation	Description
ACQUA	Advanced Communication Quality Analysis
AES	Audio Engineering Society
AMR	Adaptive multi-rate
APN	Access point name
BNC	Bayonet Neill Concelman
DUT	Device under test
GSM / GPRS	Global System for Mobile Communications / General Packet Radio Service
HHP	HEAD Handset Positioner
HMS	Head Measurement System
IMS	IP multimedia subsystem
IPsec	Internet protocol security
IPv4	Internet protocol version 4
IPv6	Internet protocol version 6
LED	Light-emitting diode
LTE	Long Term Evolution
MCC	Mobile country code
MNC	Mobile network code
PDN	Packet data network
QCI	QoS class identifier
RF	Radio frequency
RTP	Real-time transport protocol

SIM	Subscriber identity module
SIP	Session initiation protocol
UIM	User identity module
VoIP	Voice over Internet Protocol
W-CDMA	Wideband Code Division Multiple Access
XLR	Ground - left - right

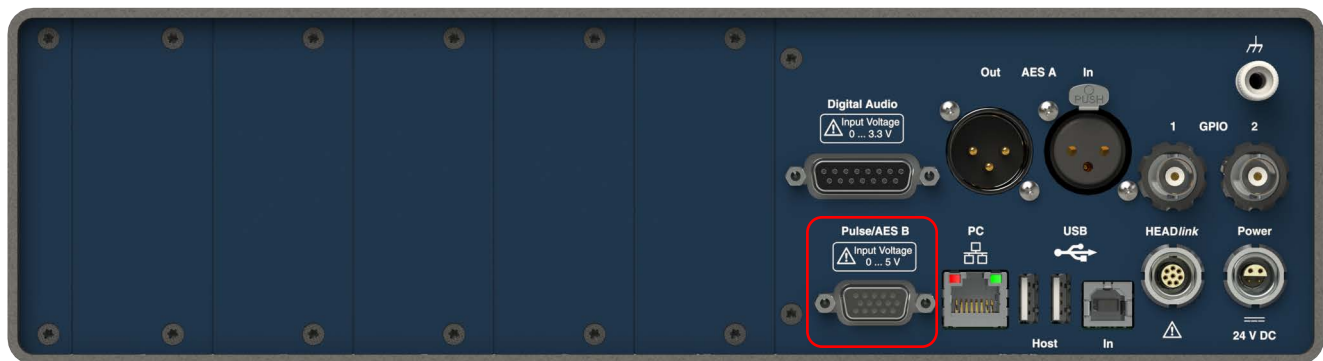
1.4 Applied Interfaces at *labCORE* and Anritsu MD8475B

1.4.1 *labCORE* Interfaces Front Panel



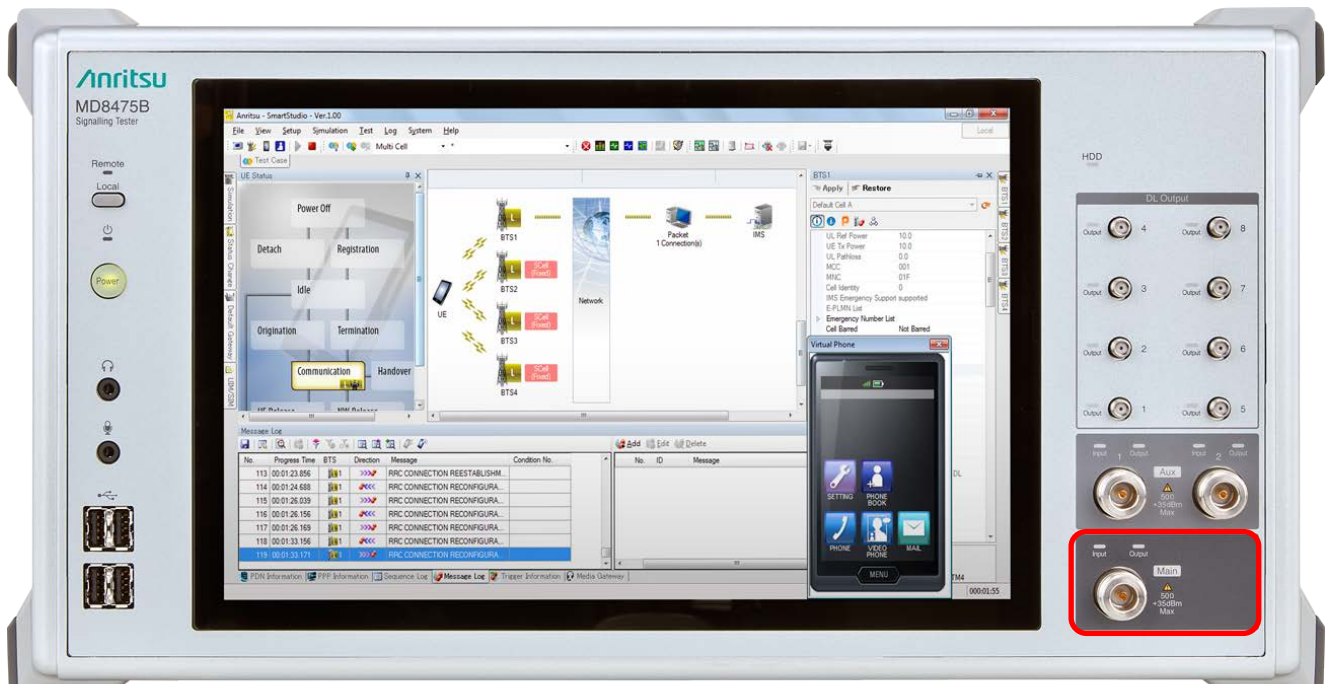
Ethernet interface (RJ45) for measuring IP-based communication

1.4.2 *labCORE* Interfaces Back Panel



D-Sub (DE-15) Pulse interface

1.4.3 Anritsu MD8475B Interfaces Front Panel



Type N RF antenna connector

1.4.4 Anritsu MD8475B Interfaces Back Panel



- CallProc Ethernet I/O socket (RJ45)
- Ethernet 0 socket (RJ45)
- Trigger output socket (BNC)

2 LTE Connection

2.1 Equipment List

2.1.1 HEAD acoustics Equipment

Required

- *labCORE* (Code 7700), Modular multi-channel hardware platform
 - *coreBUS* (Code 7710), I/O bus mainboard
 - *coreOUT-Amp2* (Code 7720), Power amplifier board
 - *coreIN-Mic4* (Code 7730), Microphone input board
 - *coreIP* (Code 7770), VoIP software extension with at least one of the following voice codecs
 - ▶ *coreIP-AMR* (Code 7772), AMR extension
 - ▶ *coreIP-EVS* (Code 7773), EVS extension
- ACQUA (Code 6810), Advanced Communication Quality Analysis software
- HMS II.3 (Code 1703), HEAD measurement system with ear simulator and artificial mouth

Optional

- *labCORE* extensions depending on device under test and/or application case
 - *coreIP-IMP* (Code 7771), VoIP impairment extension
 - *coreBEQ* (Code 7741), Binaural equalization
- Any HEAD acoustics handset positioner
 - HHP IV (Code 1406), Motorized handset positioner
 - HHP III.1 (Code 1403), Handset positioner

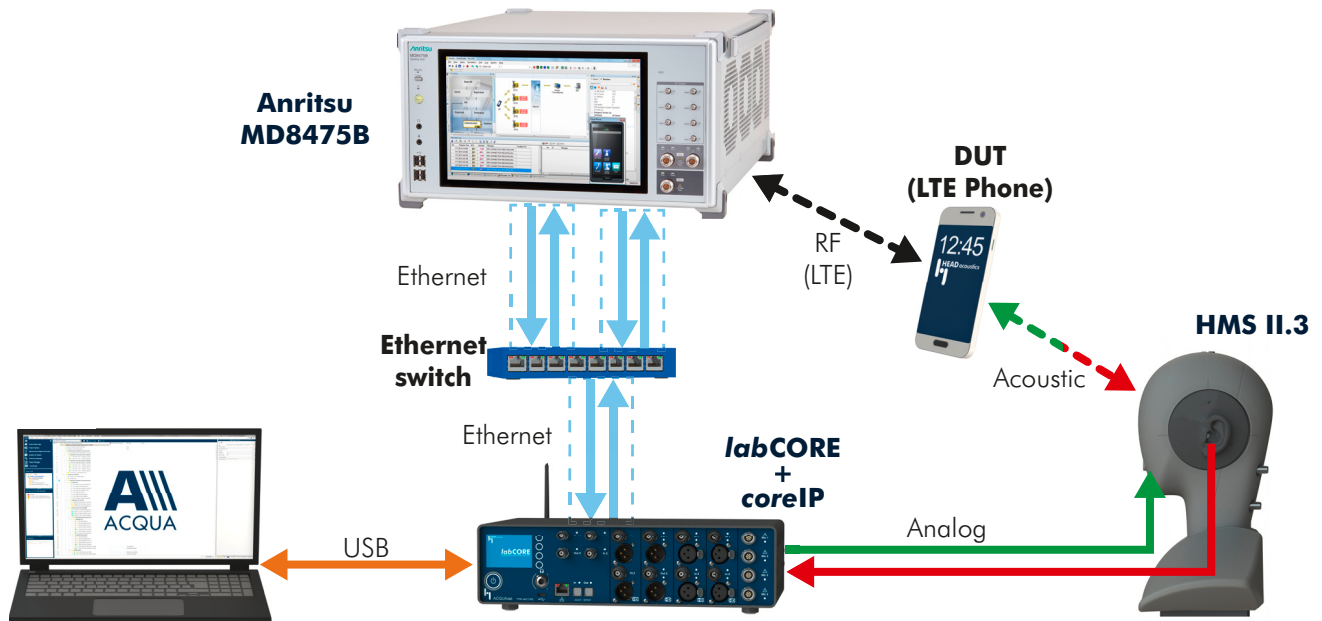
2.1.2 Anritsu Equipment

- Anritsu MD8475B Signaling Tester
- Enhanced Multi-signaling Unit
- SmartStudio©
- LTE FDD Option
- Extended CSCF Option
- LTE Simulation Software
- 1 Year Support Service

2.1.3 Third Party Equipment

- Ethernet switch
- 3 x Ethernet cable
- RF antenna
- Computer for ACQUA software
- DUT
- Test SIM card

2.2 Configuration Example

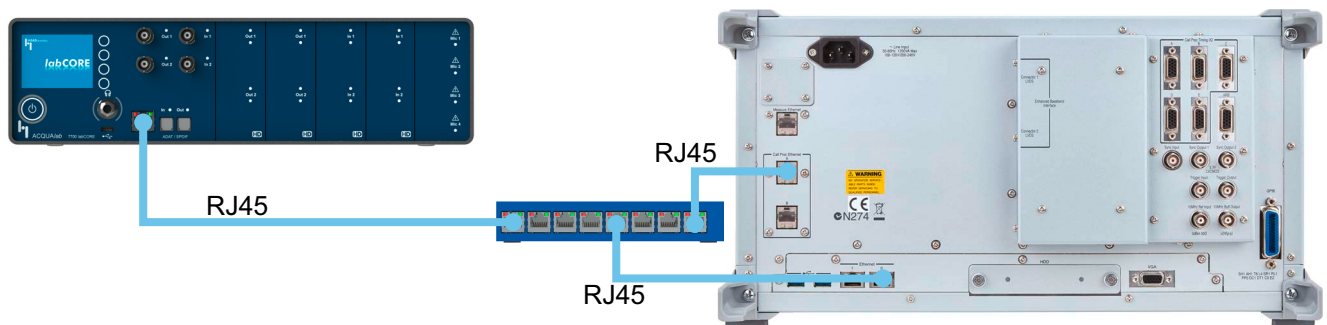


2.3 Cabling

2.3.1 Antenna



2.3.2 labCORE to Anritsu MD8475B



2.4 LTE Connection Establishment

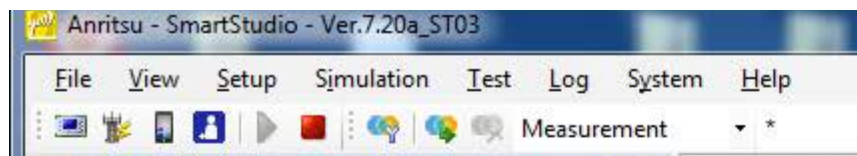
2.4.1 Preparations

- Interconnect the hardware according to chapter 2.2 and chapter 2.3
- Boot up Anritsu MD8475B
- Open SmartStudio© on Anritsu MD8475B
- Boot up computer and start ACQUA
- Boot up *lab*CORE
- Insert test SIM card into DUT and boot up DUT
- For executing NG-eCall acoustic tests, please add the steps labeled **[NG eCall]**.

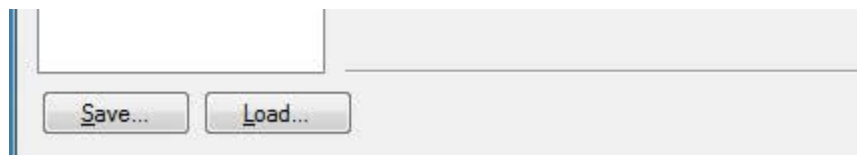
2.4.2 Connection Procedure

Anritsu MD8475B: Simulation Parameter Setup

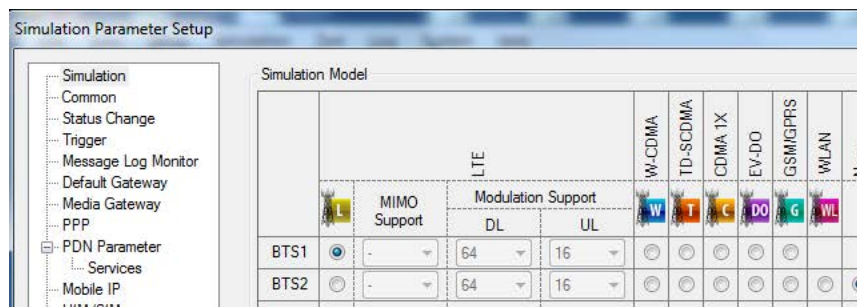
1. Open SmartStudio© V10.97a on Anritsu MD8475B.
2. **[NG eCall]**
Copy the **IMSServices.ini** file to the following folder in SmartStudio:
C:\MX847570
Regarding to **IMSServices.ini** file, please contact Anritsu sales.
Please delete **IMSServices.ini** file upon completion of the NG-eCall tests.
3. Select  to open **Simulation Parameter Setup**.



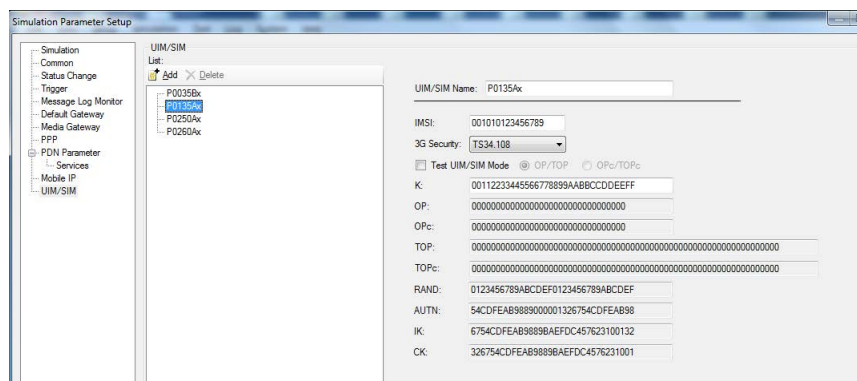
4. If available, load existing **Simulation Parameter Setup** by selecting **Load**.



5. Select **Simulation**.
6. Set **Simulation Model** to **LTE**.
7. Select **UIM/SIM**.

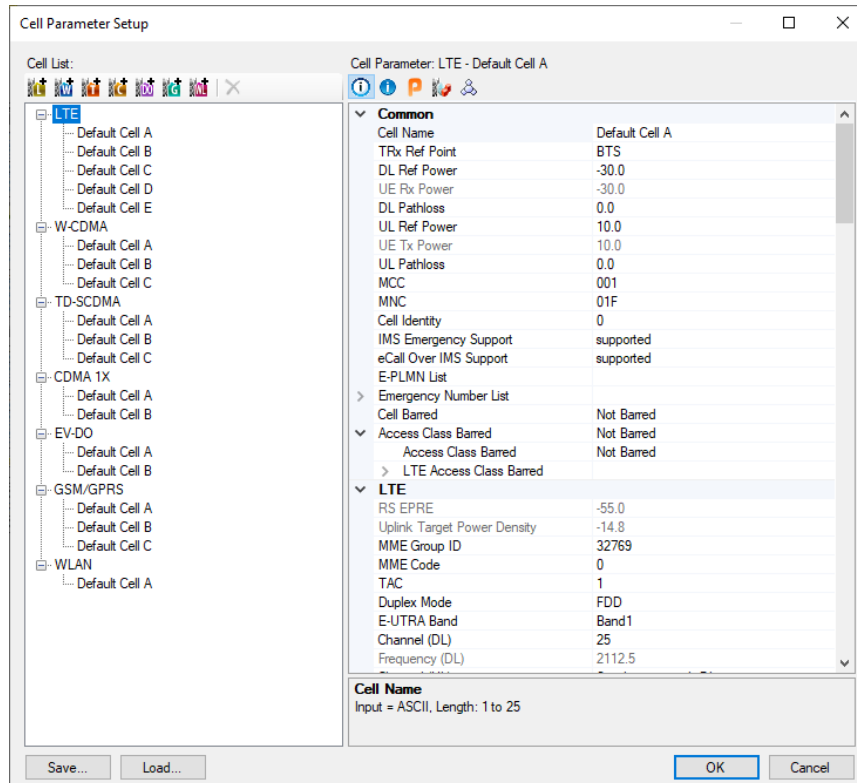
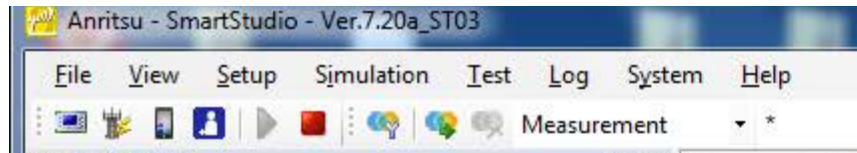


8. Check if the UIM/SIM settings apply to the SIM card of the DUT.
9. If desired, save the **Simulation Parameter Setup** by selecting **Save**.
10. Confirm **Simulation Parameter Setup** by selecting **OK**.



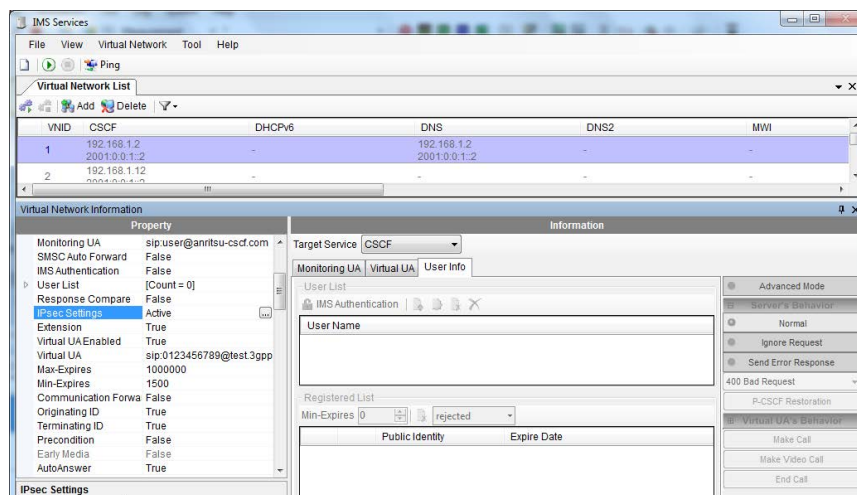
Anritsu MD8475B: Cell Parameter Setup

1. Select  to open **Cell Parameter Setup**.
2. If available, load existing **Cell Parameter Setup** setup by selecting **Load**.
3. Select **LTE** from **Cell List**.
4. Unfold **Common** in **Cell Parameter**.
5. Set the external attenuation (**DL Ref Power** and **UL Ref Power**). It shall match the attenuation of the RF antenna and the antenna cable.
6. Set the operating band (**E-UTRA Band**) according to the DUT.
7. **[NG-eCall]**
Set **Common** → **eCallOver IMS Support** → **Supported**.
8. Set the network identity **MCC** according to SIM card preferences.
9. Set the network identity **MNC** according to SIM card preferences.
10. If desired, save the simulation parameter setup by selecting **Save**.
11. Confirm cell parameter setup by selecting **Save**.

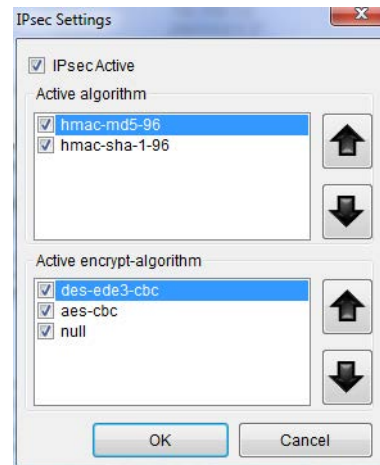


Anritsu MD8475B: IPsec and Authentication Settings

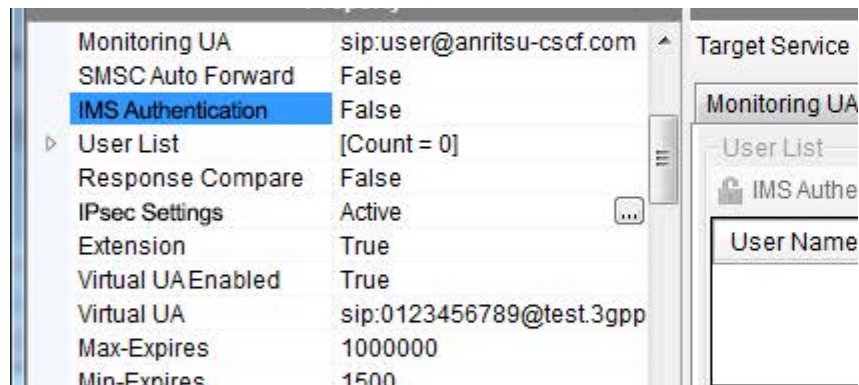
1. Select  from the task bar to open IMS services.
2. Select and highlight **IPsec settings** from the **Property** list.
3. Select  to edit IPsec settings.



4. Check the **IPsec Active** box and edit the settings according to the DUT.
or
Uncheck the **IPsec Active** box to deactivate IPsec.
5. Select **OK** to confirm **IPsec Settings**.

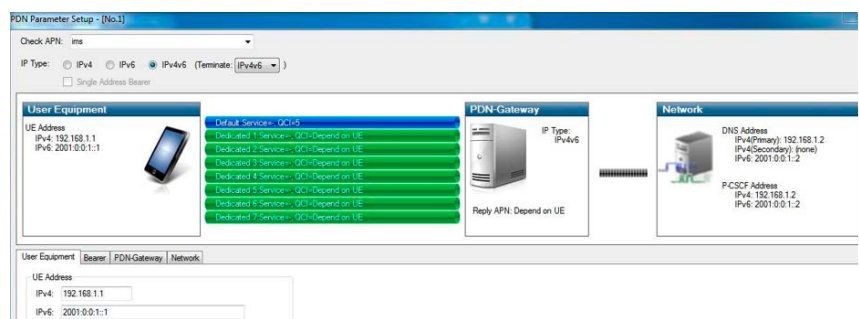
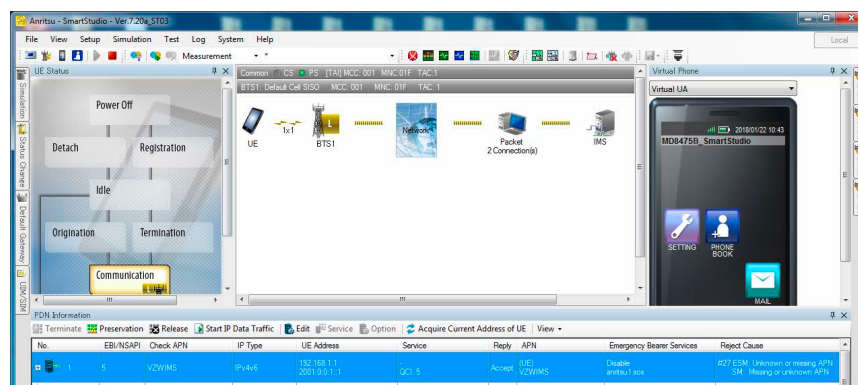


6. Set **IMS Authentication** to either **True** or **False** according to the DUT.

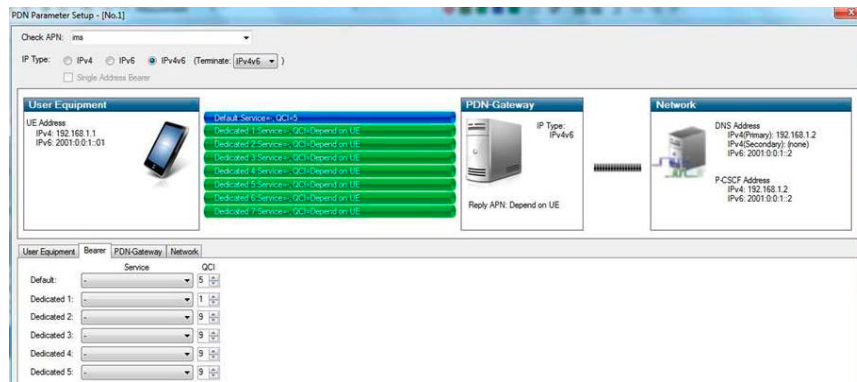


Anritsu MD8475B: PDN Parameter Setup

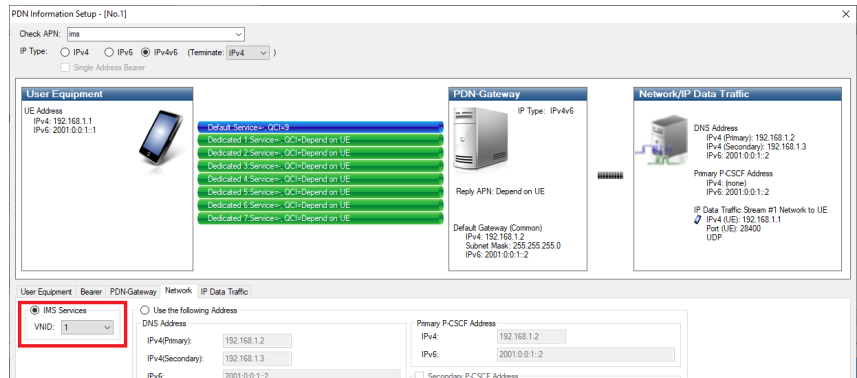
1. Select  from the task bar to switch back to the SmartStudio® main screen.
2. Select the **Packet** icon to display the PDN information window.
3. Double-click on the row of the DUT that is connected via LTE connection to the radio tester. The **PDN Parameter Setup** of the DUT pops up.
4. Ensure the APN name is set to **ims** at **Check APN**. Change it if necessary.
5. Confirm the **IP Type**. Change if necessary.
6. Select the tab **User Equipment**. Check and confirm the **IPv6** address of the DUT.



7. Select the **Bearer** tab.
8. Confirm the value **5** for the **QCI** of the default service.

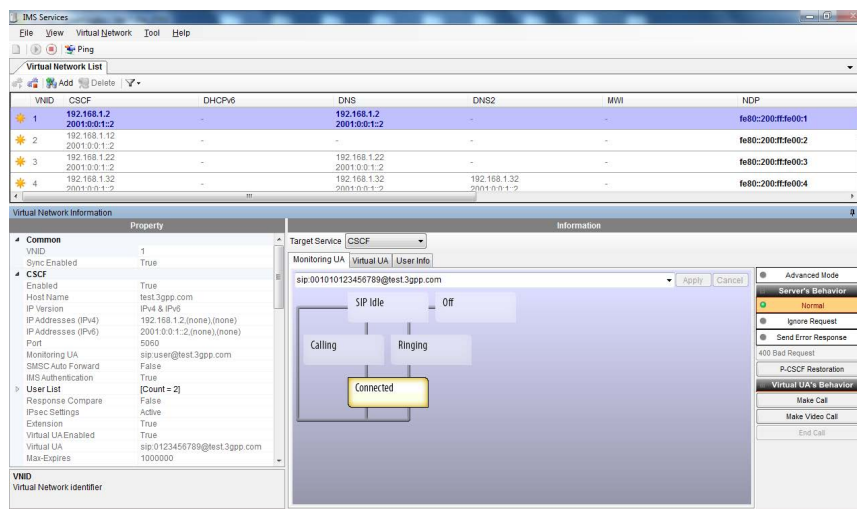


9. Select the **Network** tab.
10. The default settings apply.
11. Select **OK** to confirm and finish the **PDN Parameter Setup**.
12. **[NG-eCall]**
Set VNID for PDN1 to 1.
Set VNID for PDN8 to 1.
13. Select  to start the simulation.

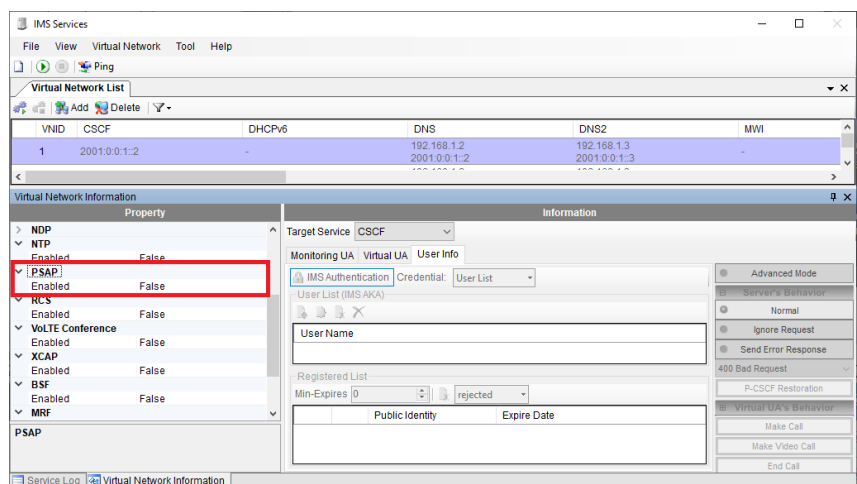


Anritsu MD8475B: IMS Server

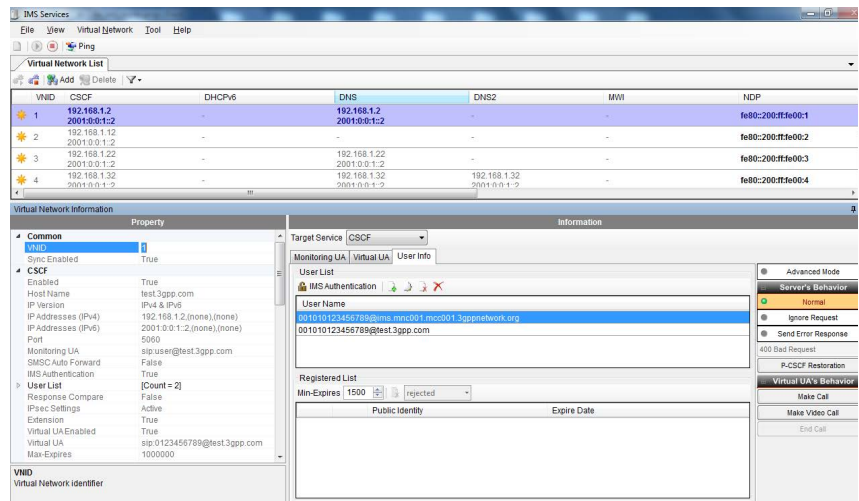
1. Select  from the task bar to open **IMS services**.
2. Set the DUT in offline mode / airplane mode.
3. **[NG-eCall]**
If IMS services already have been started, select  to stop the IMS services.



4. **[NG e-Call]**
Set the PSAP setting of each VNID.
 - VNID 1:
PSAP Enabled → True
 - VNID2 to VNID8:
PSAP Enabled → False
5. **[NG-eCall]**
Select  to start the IMS services.

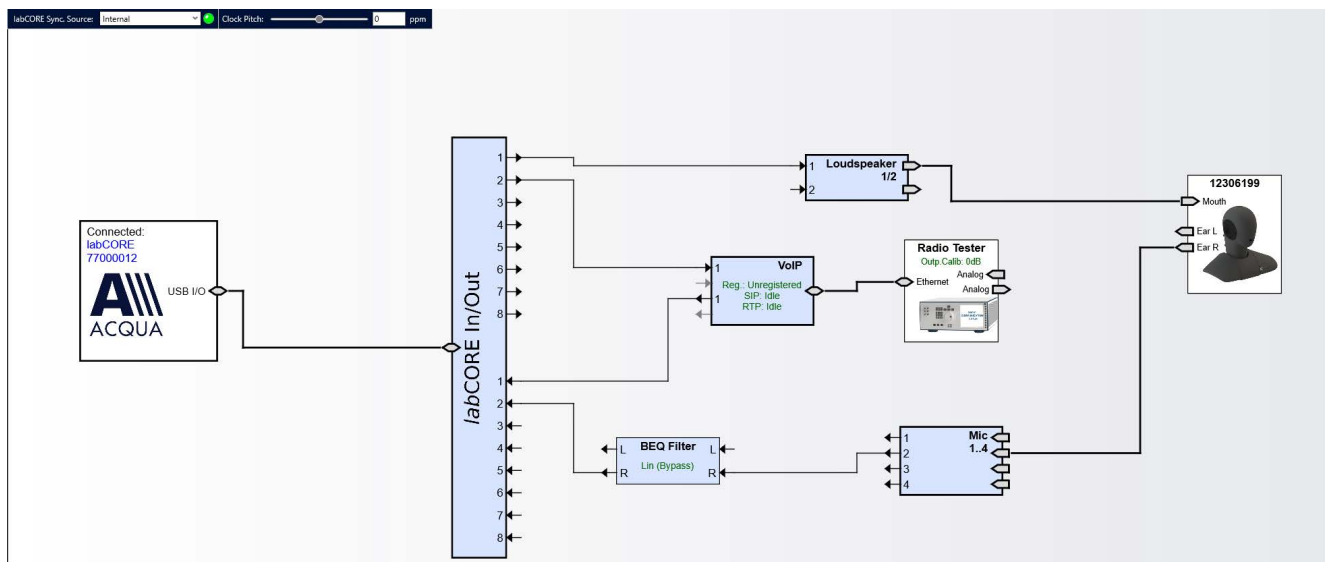


6. Select the **User Info** tab.
7. Select **IMS Authentication** to unlock IMS authentication.

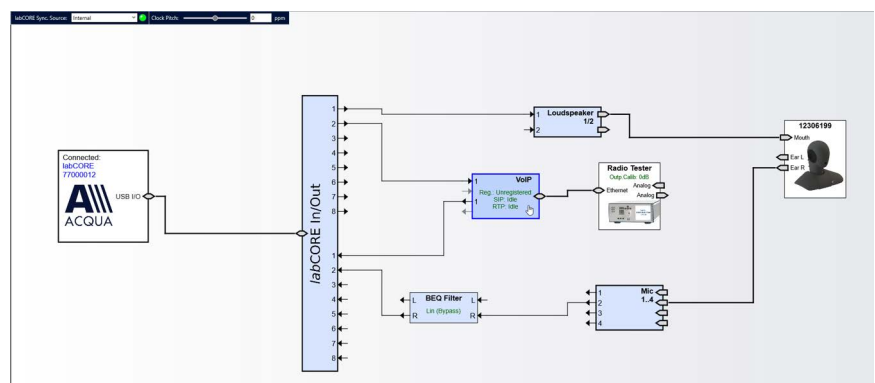


ACQUA Computer: Hardware Configuration and Radio Tester Wizard

1. Start Hardware Configuration.
2. Select *labCORE* and build the configuration.



3. Select the **VoIP** block.



4. Select the **Call** tab.
5. Enable **Automatic Jitter Buffer Reset**.
6. Select **Radio Tester Wizard**.

The screenshot shows the 'VoIP Settings' application window with the 'Call' tab selected. The interface includes several sections: 'SIP Call' with a 'Target' dropdown, an 'Autocomplete' checkbox, and a 'Status' indicator set to 'Idle'; 'RTP Stream' with a 'Remote' dropdown set to '127.0.0.1' and a 'Status' indicator set to 'Idle'; 'Debug' with a 'VoIP Log' checkbox and 'Download'/'Reset' buttons; and 'Jitter Buffer Reset' with an 'Automatic' checkbox and a 'Manual Reset' button. At the bottom, a status bar shows 'Audio System' and 'VoIP System' as active (green checkmarks), and 'SIP Registration', 'SIP Call', and 'RTP Stream' as inactive (grey circles). Navigation buttons 'Call' and 'Terminate' are visible in the SIP Call section.

7. Select the Anritsu MD8475B. The Internet protocol (IPv4, IPv6) depends on the DUT.

The screenshot shows the 'VoIP Settings' application window with the 'Radio Tester Wizard' tab selected. A sidebar on the left contains a 'Select Radio Tester' button and a list of settings: 'IP Settings', 'RTP Settings', 'SIP Settings', 'Registrar Settings', and 'Check Parameter'. The main area is titled 'Select Radio Tester' and displays four radio button options: 'Anritsu MD8475 LTE (IPv4)' (selected), 'Anritsu MD8475 LTE (IPv6)', 'Anritsu MD8475 2G/3G', and 'Rohde & Schwarz CMW 500'. At the bottom, a status bar shows 'Audio System' and 'VoIP System' as active (green checkmarks), and 'SIP Registration', 'SIP Call', and 'RTP Stream' as inactive (grey circles). Navigation buttons '< Back' and 'Next >' are visible.

8. Select **IP Settings**.
9. Enter/verify the **IP Settings**.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings**
- RTP Settings
- SIP Settings
- Registrar Settings
- Check Parameter

IP Settings

IP	192 . 168 . 1 . 101
Subnet Mask	255 . 255 . 0 . 0
Gateway	192 . 168 . 1 . 2
DNS	0 . 0 . 0 . 0

< Back Next >

Status: Audio System Reset VoIP System Reset SIP Registration SIP Call RTP Stream

10. Select **RTP Settings**.
11. Enter a suitable initial jitter buffer length. Default setting is 140 ms.
12. Select the desired voice codec.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings
- RTP Settings**
- SIP Settings
- Registrar Settings
- Check Parameter

RTP Settings

General

Initial jitter buffer length ms

Packet Length ms

Codec Configuration

Codec

Encoder Param.

FMTP

< Back Next >

Status: Audio System Reset VoIP System Reset SIP Registration SIP Call RTP Stream

13. Select **SIP Settings**.

14. Enter/verify the SIP settings.

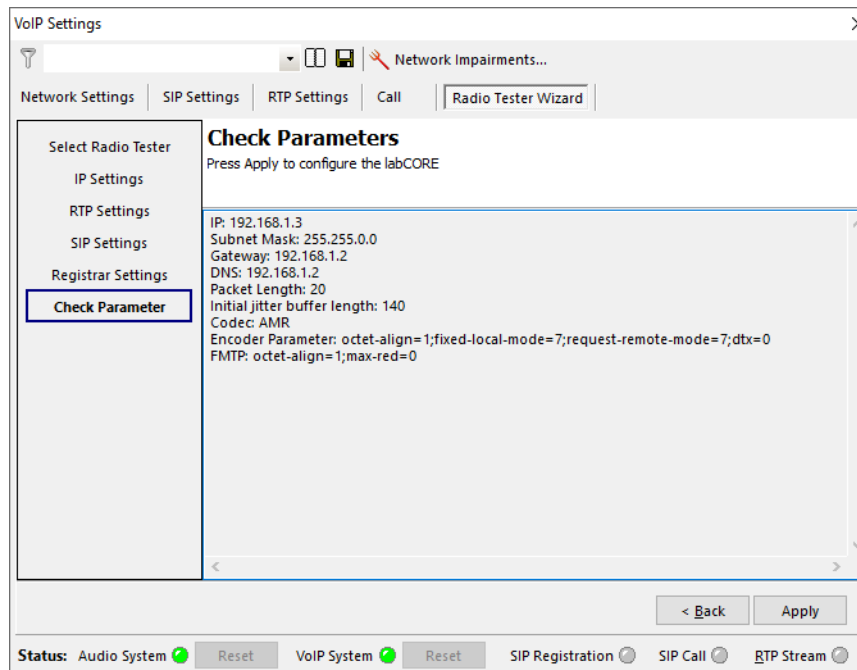
The screenshot shows the 'VoIP Settings' application window. On the left, a sidebar menu lists: 'Select Radio Tester', 'IP Settings', 'RTP Settings', 'SIP Settings' (highlighted with a blue border), 'Registrar Settings', and 'Check Parameter'. The main area is titled 'SIP Settings' and contains two input fields: 'SIP Port' with the value '7060' and a dropdown menu set to 'UDP', and 'Contact' with the value 'sip:2345@192.168.1.101:7060'. At the bottom, there are navigation buttons '< Back' and 'Next >'. A status bar at the very bottom shows: 'Status: Audio System' with a green checkmark and a 'Reset' button, 'VoIP System' with a green checkmark and a 'Reset' button, and three disabled options: 'SIP Registration', 'SIP Call', and 'RTP Stream'.

15. Select **Registrar Settings**.

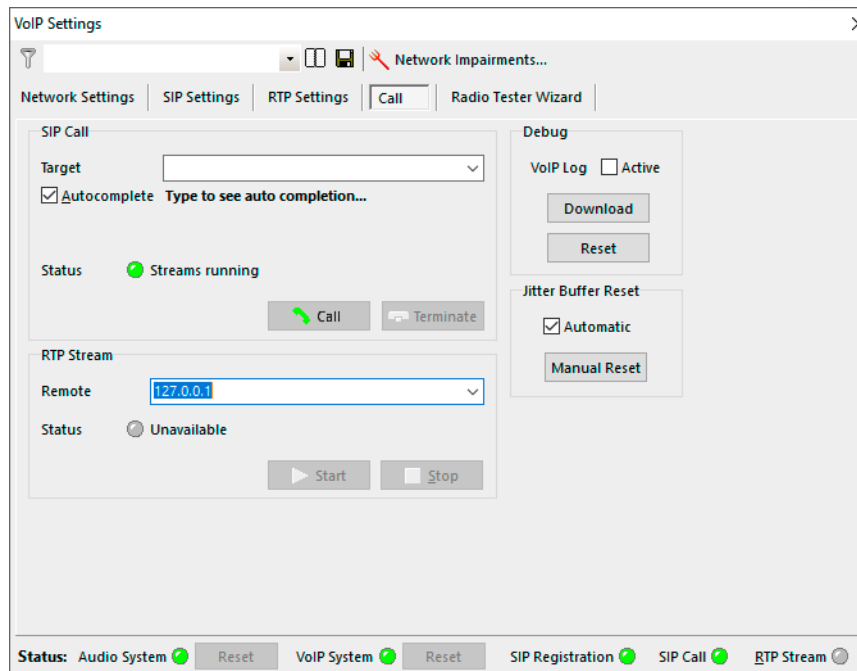
16. Enter/verify the Registrar settings.

The screenshot shows the 'VoIP Settings' application window with the 'Registrar Settings' screen selected. The sidebar menu is the same as in the previous screenshot, but 'Registrar Settings' is now highlighted with a blue border. The main area is titled 'Registrar Settings' and contains several input fields: 'Server Address' (192.168.1.2:5060), 'User ID' (2345), 'Password' (empty), 'Identity' (sip:2345@test.3gpp.com), 'Contact Parameter' (empty), and 'Outbound Proxy' (192.168.1.2). Navigation buttons '< Back' and 'Next >' are at the bottom. The status bar at the bottom remains the same as in the previous screenshot.

17. Select **Check Parameters**.
18. Verify all set parameters.
19. Select **Apply** to register the *labCORE* at Anritsu MD8475B.

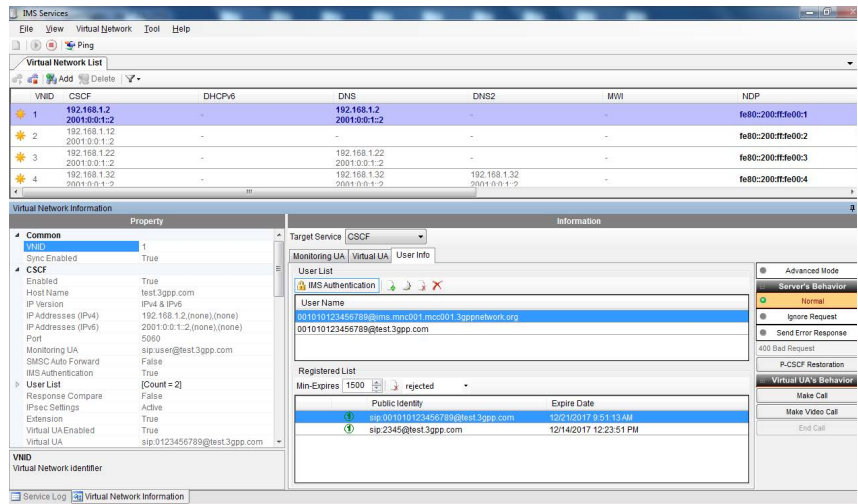


20. The green LED at the bottom confirms the successful **SIP Registration**.
21. The SIP address of *labCORE* appears in the **Registered List** on Anritsu MD8475B.



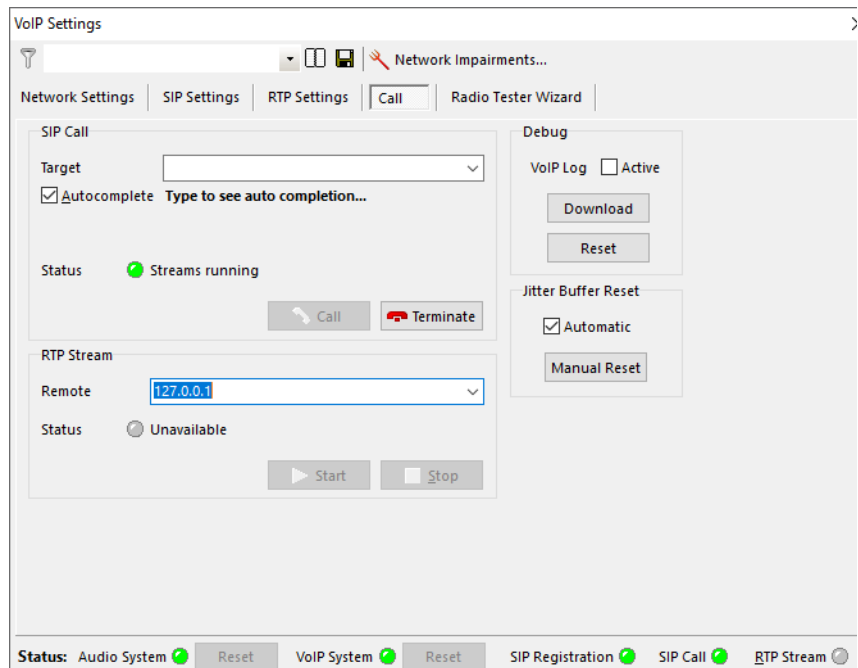
Anritsu MD8475B: IMS Server

1. Set the DUT back online and let it register at the IMS server.
2. The SIP address of the DUT appears in the **Registered List** on Anritsu MD8475B.
3. If IPsec is active at Anritsu MD8475B: Select  **IMS Authentication** to lock IMS authentication.
Do not lock IMS authentication if IPsec is inactive at Anritsu MD8475B and not required by the DUT.
4. Check if DUT and *labCORE* have the same public identity address (example@test3gpp.com) in the **Registered List**.



ACQUA Computer: Call Execution

1. Enter the SIP address of the DUT in ACQUA and select **Call** to connect DUT and *labCORE*.
2. The connection is established.



3 2G Connection

3.1 Equipment List

3.1.1 HEAD acoustics Equipment

Required

- *labCORE* (Code 7700), Modular multi-channel hardware platform
 - *coreBUS* (Code 7710), I/O bus mainboard
 - *coreOUT-Amp2* (Code 7720), Power amplifier board
 - *coreIN-Mic4* (Code 7730), Microphone input board
 - *coreIP* (Code 7770), VoIP software extension with codec
- ACQUA (Code 6810), Advanced Communication Analysis software
- HMS II.3 (Code 1703), HEAD measurement system with ear simulator and artificial mouth
- CDM V (Code 1637), Cable D-Sub 15-pin 2 x XLR (AES/EBU in/out) + 2 x BNC (pulse in/out)

Optional

- *labCORE* extensions depending on device under test and/or application case
 - *coreIP-IMP* (Code 7771), VoIP impairment extension
 - *coreIP-AMR* (Code 7772), AMR extension
 - *coreBEQ* (Code 7741), Binaural equalization
- Any HEAD acoustics handset positioner
 - HHP IV (Code 1406), Motorized handset positioner
 - HHP III.1 (Code 1403), Handset positioner

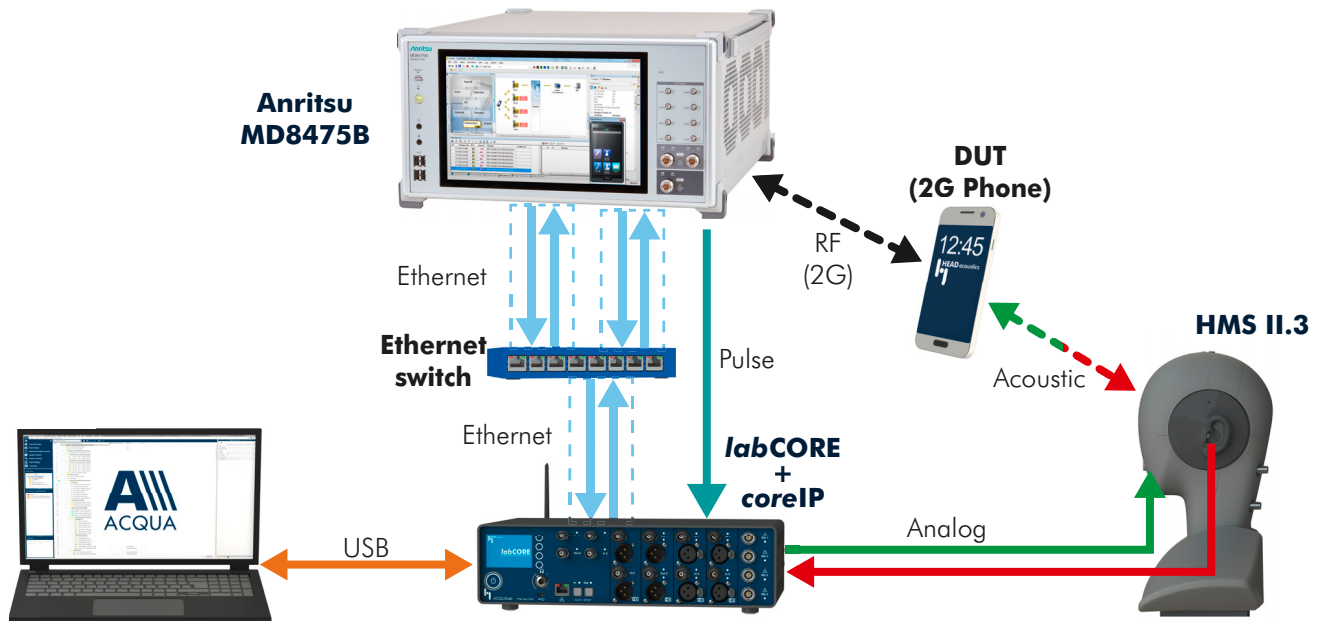
3.1.2 Anritsu Equipment

- Anritsu MD8475B Signaling Tester
- SmartStudio©
- GSM Option
- GSM/GPRS Simulation Software
- GSM Signalling Unit
- 1 Year Support Service
- SIPviaMD8475

3.1.3 Third Party Equipment

- Ethernet switch
- 3 x Ethernet cable
- BNC cable
- RF antenna
- Computer for ACQUA software
- DUT
- Test SIM card

3.2 Configuration Example

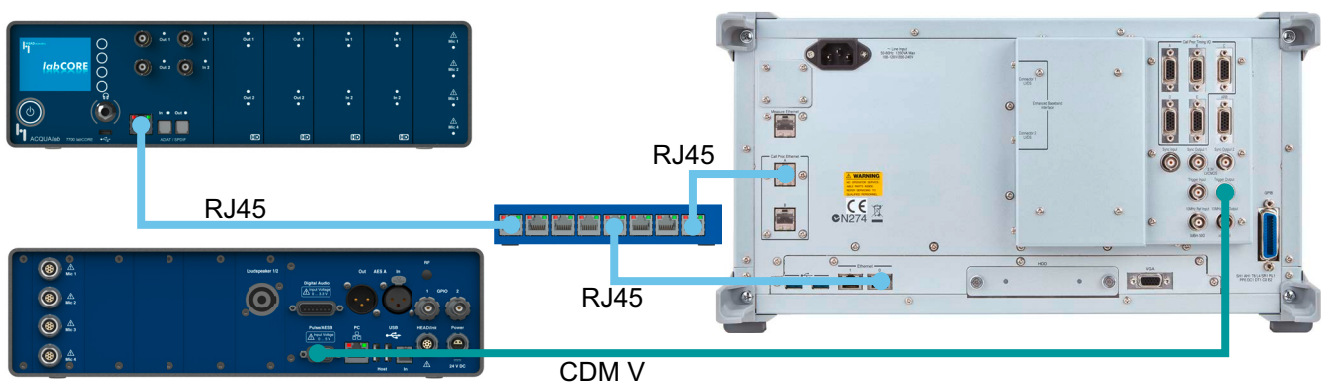


3.3 Cabling

3.3.1 Antenna



3.3.2 labCORE to Anritsu MD8475B



3.4 2G Connection Establishment

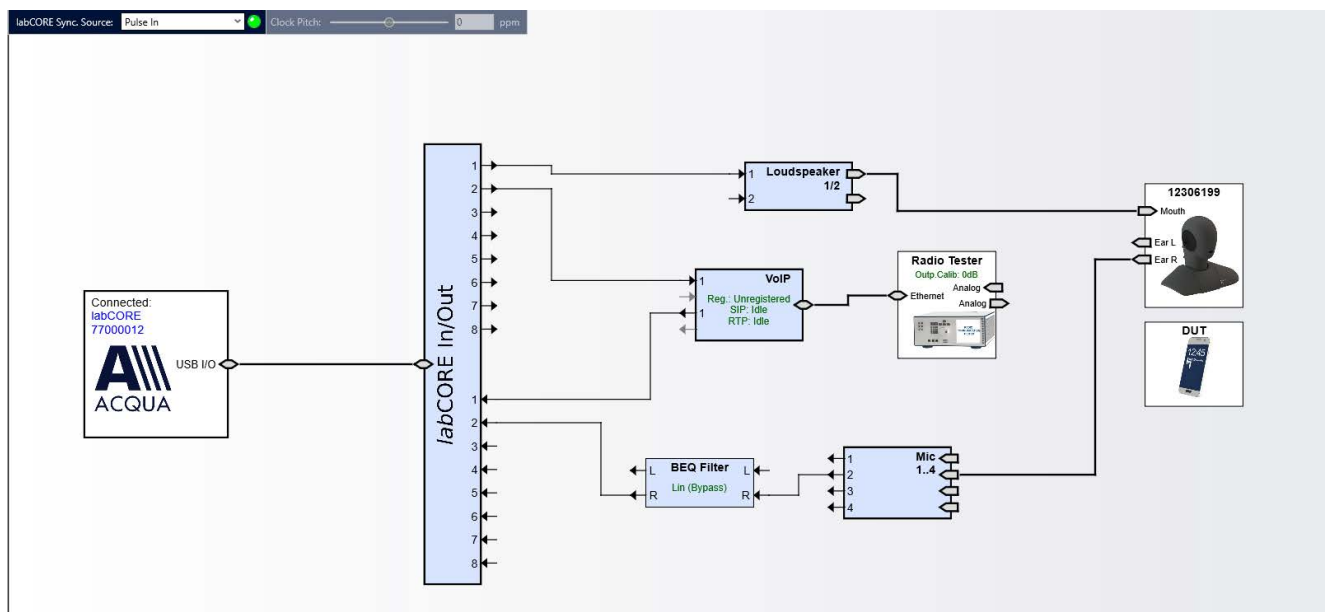
3.4.1 Preparation

- Interconnect the hardware according to chapter 3.2 and chapter 3.3
- Boot up Anritsu MD8475B
- Open SmartStudio© on Anritsu MD8475B
- Boot up computer and start ACQUA
- Boot up *labCORE*
- Insert test SIM card into DUT and boot up DUT

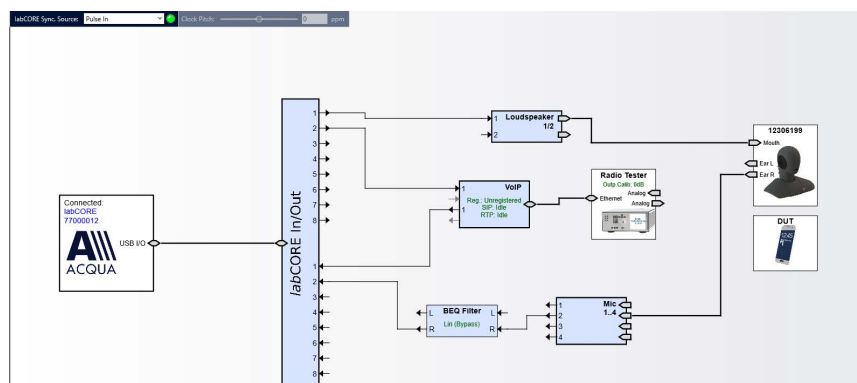
3.4.2 Connection Procedure

ACQUA Computer: Hardware Configuration

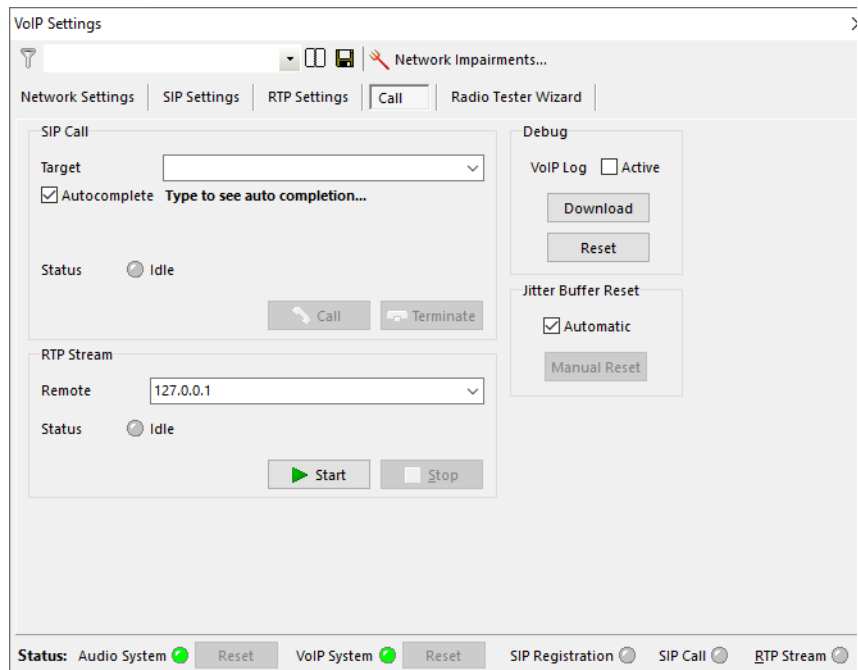
1. Start **Hardware Configuration**.
2. Select *labCORE* and build the configuration.



3. Select the **VoIP** block.

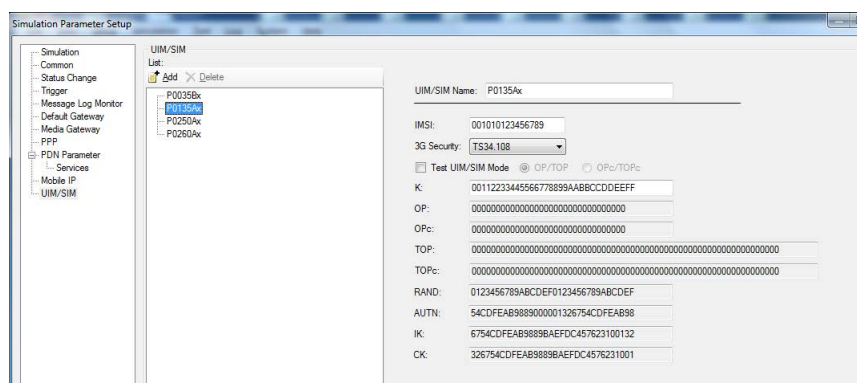
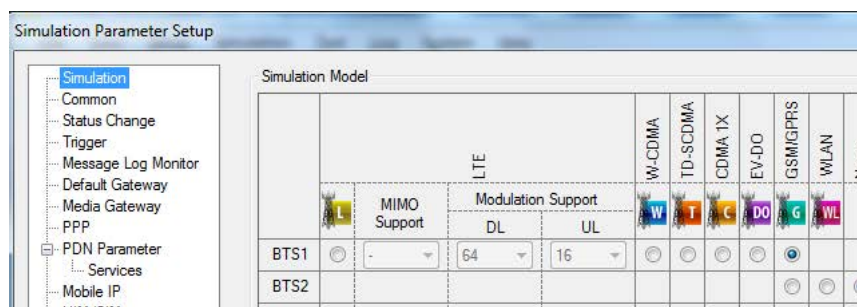
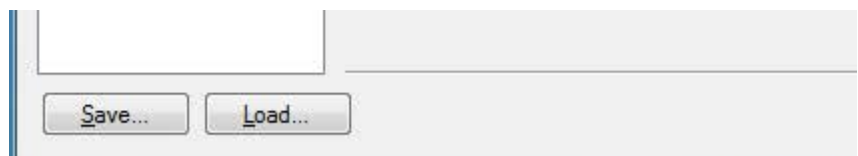
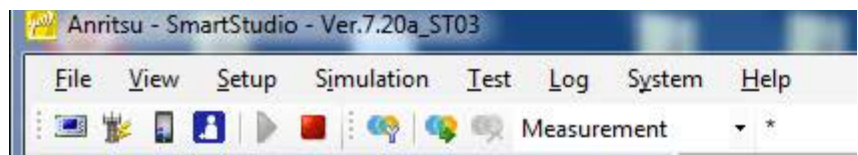


4. Select the **Call** tab.
5. Enable **Automatic Jitter Buffer Reset**.



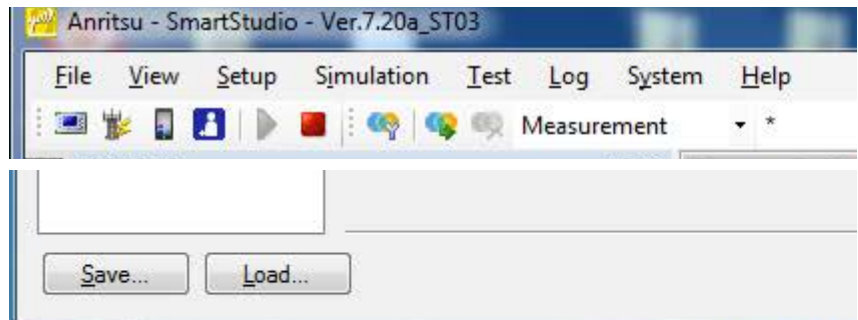
Anritsu MD8475B: Connection Parameters

1. Open SmartStudio© on Anritsu MD8475B.
2. Select  to open **Simulation Parameter Setup**.
3. If available, load existing **Simulation Parameter Setup** by selecting **Load**.
4. Select **Simulation**.
5. Set **Simulation Model** to **GSM/GPRS**.
6. Select **UIM/SIM**.
7. Check if the UIM/SIM settings apply to the SIM card of the DUT.
8. If desired, save the **Simulation Parameter Setup** by selecting **Save**.
9. Confirm **Simulation Parameter Setup** by selecting **OK**.



10. Select  to open **Cell Parameter Setup**.

11. If available, load existing **Cell Parameter Setup** by selecting **Load**.



12. Select **GSM/GPRS** from the **Cell list**.

13. Unfold **Common** in **Cell parameter**.

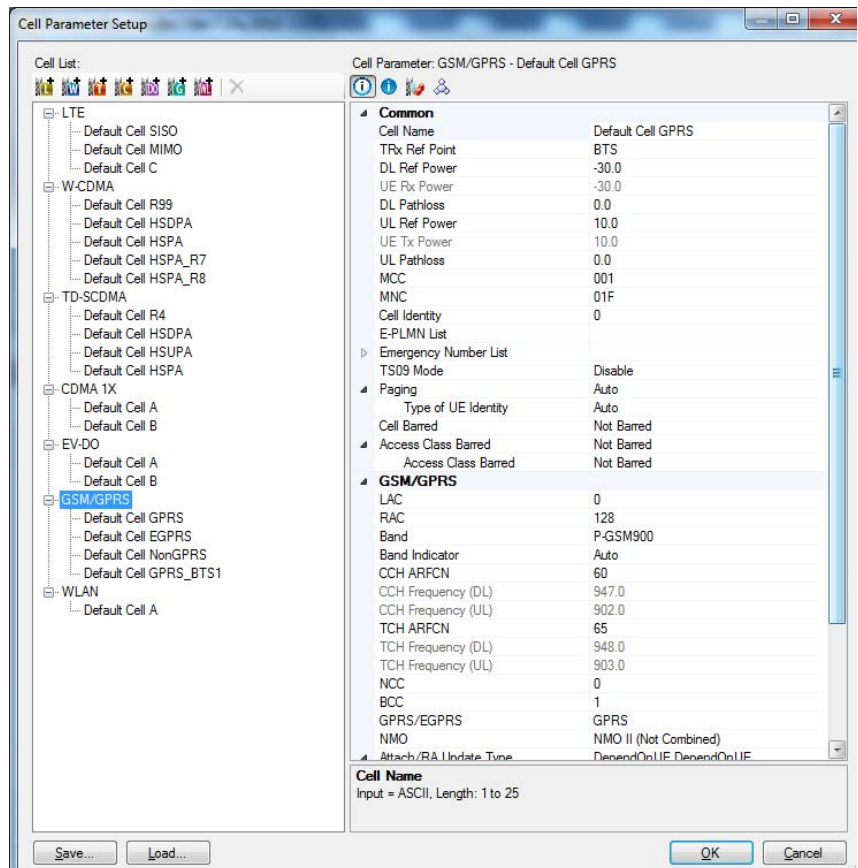
14. Set the external attenuation (**DL Ref Power** and **UL Ref Power**). It shall match the attenuation of the RF antenna and the antenna cable.

15. Set the network identity **MCC** according to SIM card preferences.

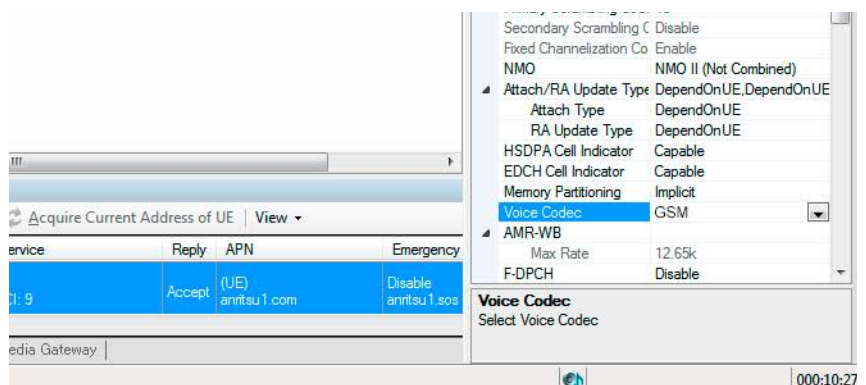
16. Set the network identity **MNC** according to SIM card preferences.

17. If desired, save the **Cell Parameter Setup** by selecting **Save**.

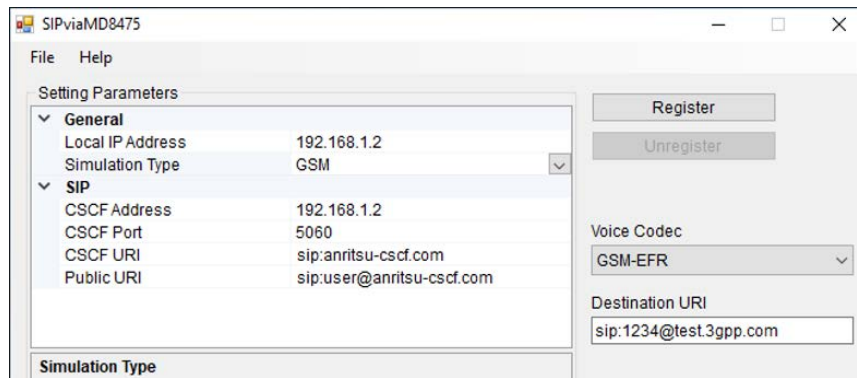
18. Confirm **Cell Parameter Setup** by selecting **OK**.



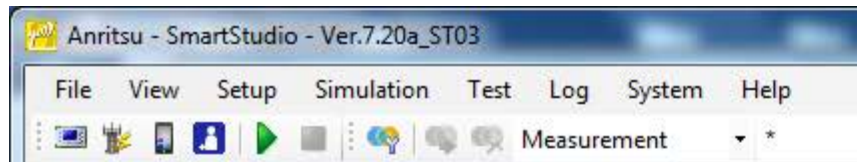
19. Select the desired GSM voice codec in SmartStudio®.



20. Open **SIPviaMD8475**.
21. Set **GSM** as **Simulation Type**.
22. Set desired codec as **Voice Codec** consistent to SmartStudio©.
23. Select **Register**.

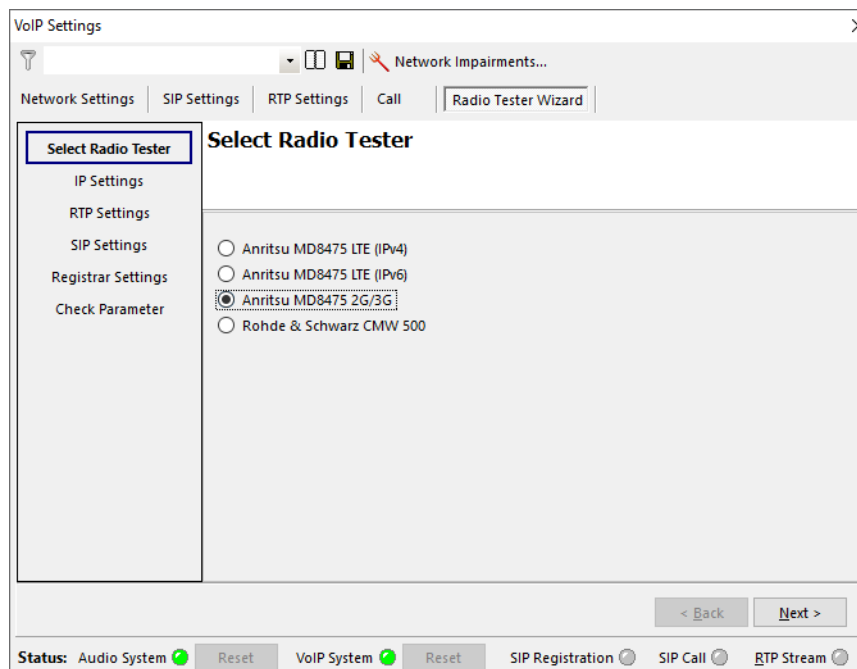


24. Go to SmartStudio©.
25. Select  to start the simulation.



ACQUA Computer: Radio Tester Wizard

1. Select the **Radio Tester Wizard** tab.
2. Select **Anritsu MD8475 2G/3G**.



3. Select **IP Settings**.
4. Enter/verify the **IP Settings**.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings**
- RTP Settings
- SIP Settings
- Registrar Settings
- Check Parameter

IP Settings

IP: 192 . 168 . 1 . 101

Subnet Mask: 255 . 255 . 0 . 0

Gateway: 192 . 168 . 1 . 2

DNS: 0 . 0 . 0 . 0

< Back Next >

Status: Audio System ● Reset VoIP System ● Reset SIP Registration ● SIP Call ● RTP Stream ●

5. Select **RTP Settings**.
6. Enter a suitable **Initial jitter buffer length**. Default setting is 140 ms.
7. Select the voice codec in accordance with **SIPviaMD8475**.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings
- RTP Settings**
- SIP Settings
- Registrar Settings
- Check Parameter

RTP Settings

General

Initial jitter buffer length: 140 ms

Packet Length: 20 ms

Codec Configuration

Codec: GSM-EFR

Encoder Param.:

FMTP:

< Back Next >

Status: Audio System ● Reset VoIP System ● Reset SIP Registration ● SIP Call ● RTP Stream ●

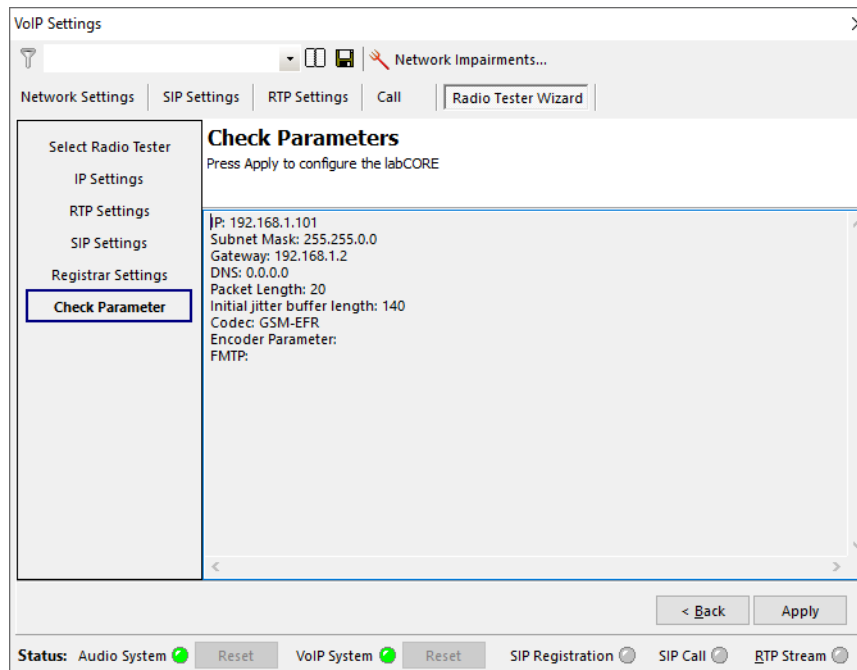
8. Select **SIP Settings**.
9. Enter/verify the **SIP Settings**.

The screenshot shows the 'VoIP Settings' application window. The title bar reads 'VoIP Settings'. Below the title bar is a toolbar with icons for a key, a folder, a save icon, and a wrench. To the right of the toolbar is a tabbed interface with tabs for 'Network Settings', 'SIP Settings', 'RTP Settings', 'Call', and 'Radio Tester Wizard'. The 'SIP Settings' tab is selected. On the left side of the window is a vertical sidebar with a list of settings: 'Select Radio Tester', 'IP Settings', 'RTP Settings', 'SIP Settings' (highlighted with a blue border), 'Registrar Settings', and 'Check Parameter'. The main area of the window is titled 'SIP Settings' and contains two input fields: 'SIP Port' with the value '7060' and a dropdown menu set to 'UDP', and 'Contact' with the value 'sip:1234@192.168.1.101:7060'. At the bottom of the window is a status bar with the text 'Status: Audio System' followed by a green checkmark and a 'Reset' button, 'VoIP System' followed by a green checkmark and a 'Reset' button, and three radio buttons for 'SIP Registration', 'SIP Call', and 'RTP Stream'.

10. Select **Registrar Settings**.
11. Enter/verify the **Registrar Settings**.

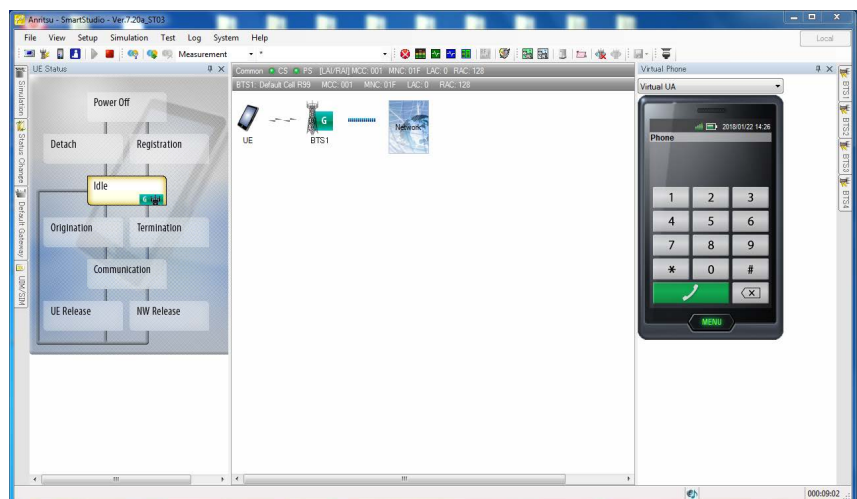
The screenshot shows the 'VoIP Settings' application window with the 'Registrar Settings' tab selected. The sidebar on the left now has 'Registrar Settings' highlighted with a blue border. The main area is titled 'Registrar Settings' and contains several input fields: 'Server Address' with the value '192.168.1.2:5060', 'User ID' with the value '1234', 'Password' (empty), 'Identity' with the value 'sip:1234@test.3gpp.com', 'Contact Parameter' (empty), and 'Outbound Proxy' (empty). The status bar at the bottom remains the same as in the previous screenshot.

12. Select **Check Parameter**.
13. Verify all set parameters.
14. Select **Apply** to register the *labCORE* at Anritsu MD8475B.



Anritsu MD8475B: Call Execution

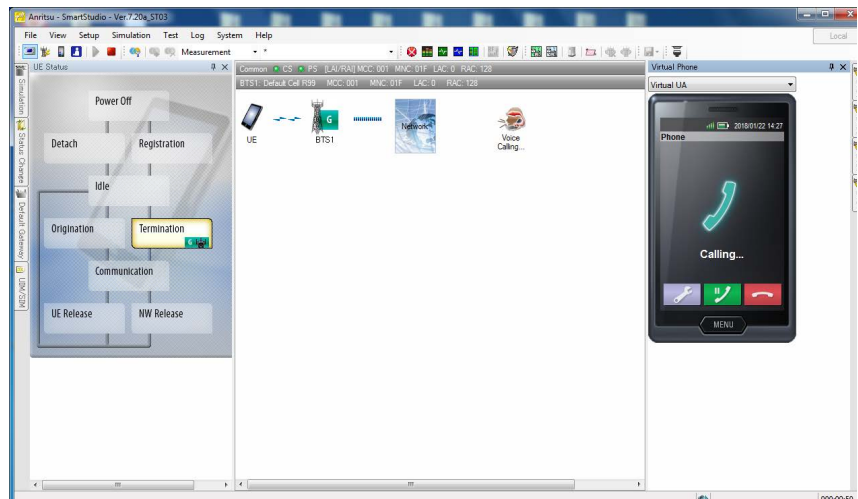
1. Go to the SmartStudio© main screen. The status of the DUT (UE status) is **Idle**.



2. Enter any number (e.g., 123) on the keypad of the virtual phone on the screen.
3. Select the green call button to initiate the call. The radio tester waits for the call acceptance of the DUT.



4. Accept the call at the DUT.
5. The status of the DUT switches from **Termination** to **Communication**.



4 3G Connection

4.1 Equipment List

4.1.1 HEAD acoustics Equipment

Required

- *labCORE* (Code 7700), Modular multi-channel hardware platform
 - *coreBUS* (Code 7710), I/O bus mainboard
 - *coreOUT-Amp2* (Code 7720), Power amplifier board
 - *coreIN-Mic4* (Code 7730), Microphone input board
 - *coreIP* (Code 7770), VoIP software extension with codec
 - *coreIP-AMR* (Code 7772), AMR extension
- ACQUA (Code 6810), Advanced Communication Analysis software
- HMS II.3 (Code 1703), HEAD measurement system with ear simulator and artificial mouth
- CDM V (Code 1637), Cable D-Sub 15-pin 2 x XLR (AES/EBU in/out) + 2 x BNC (pulse in/out)

Optional

- *labCORE* extensions depending on device under test and/or application case
 - *coreIP-IMP* (Code 7771), VoIP impairment extension
 - *coreBEQ* (Code 7741), Binaural equalization
- Any HEAD acoustics handset positioner
 - HHP IV (Code 1406), Motorized handset positioner
 - HHP III.1 (Code 1403), Handset positioner

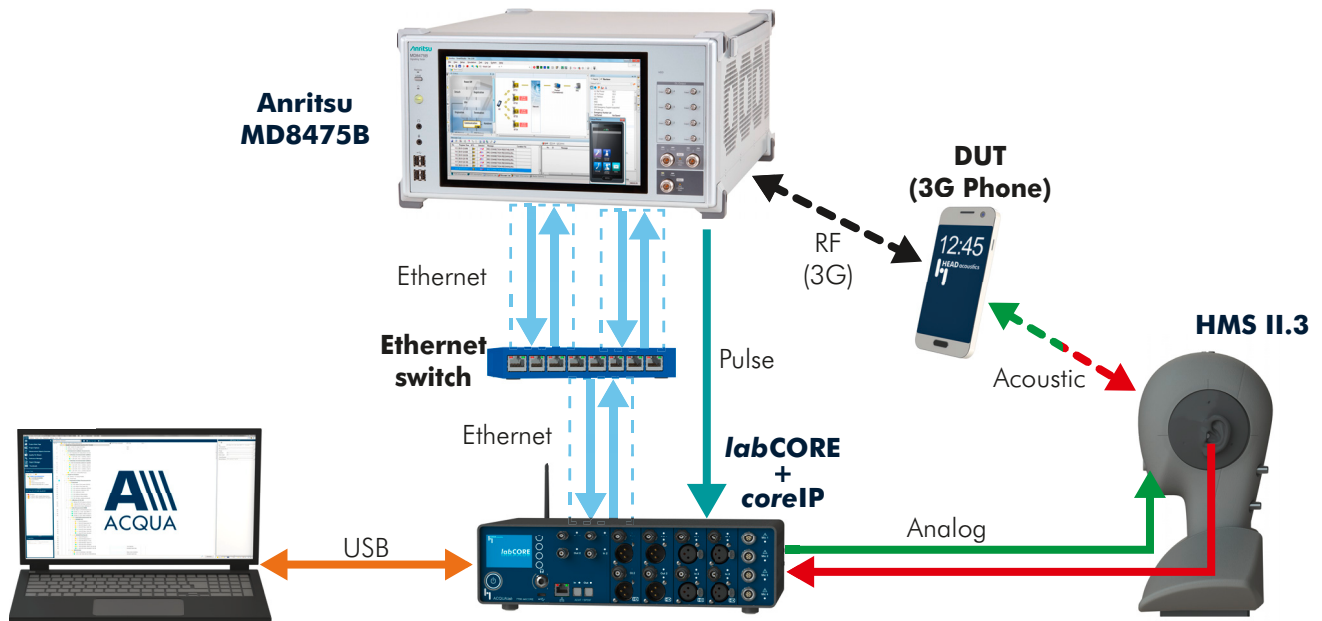
4.1.2 Anritsu Equipment

- Anritsu MD8475B Signalling Tester
- SmartStudio©
- W-CDMA Option
- Enhanced Multi-signalling Unit
- W-CDMA Simulation Software
- 1 Year Support Service
- SIPviaMD8475

4.1.3 Third Party Equipment

- Ethernet switch
- 3 x Ethernet cable
- BNC cable
- RF antenna
- Computer for ACQUA software
- DUT
- Test SIM card

4.2 Configuration Example

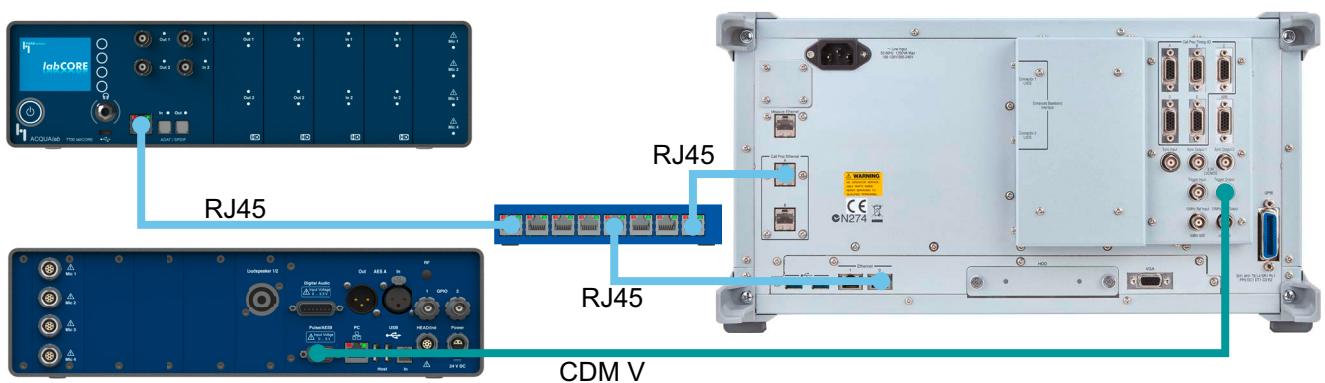


4.3 Cabling

4.3.1 Antenna



4.3.2 labCORE to Anritsu MD8475B



4.4 3G Connection Establishment

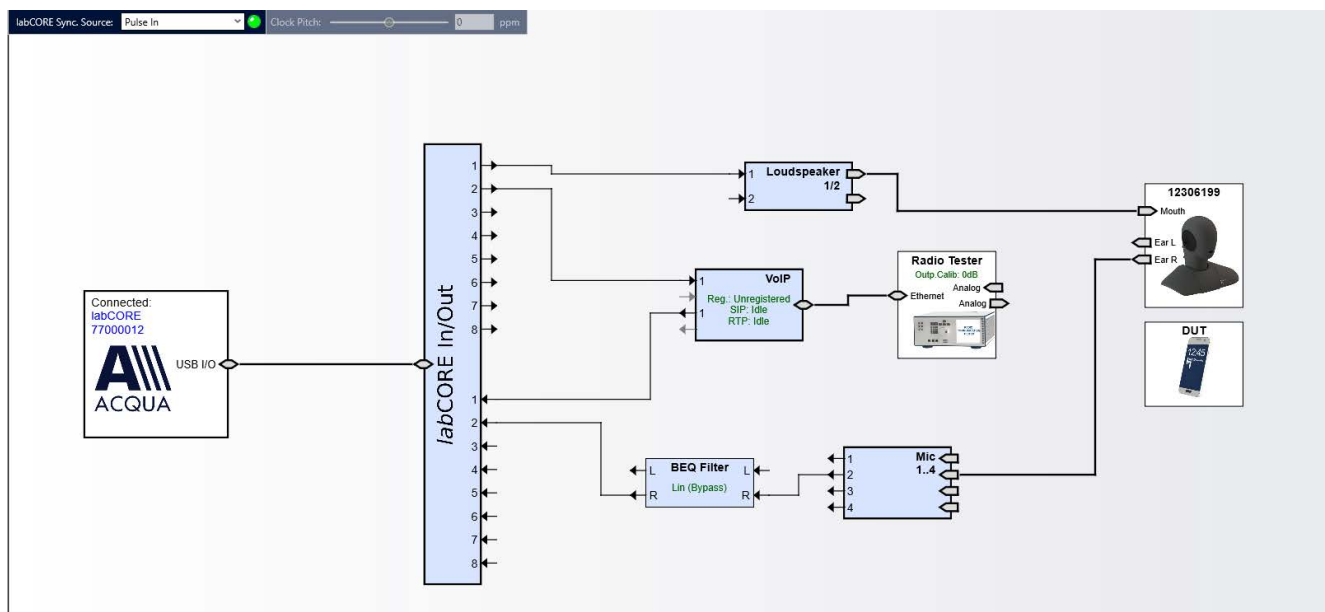
4.4.1 Preparation

- Interconnect the hardware according to chapter 4.2 and chapter 4.3
- Boot up Anritsu MD8475B
- Open SmartStudio© on Anritsu MD8475B
- Boot up computer and start ACQUA
- Boot up *lab*CORE
- Insert SIM card into DUT and boot up DUT

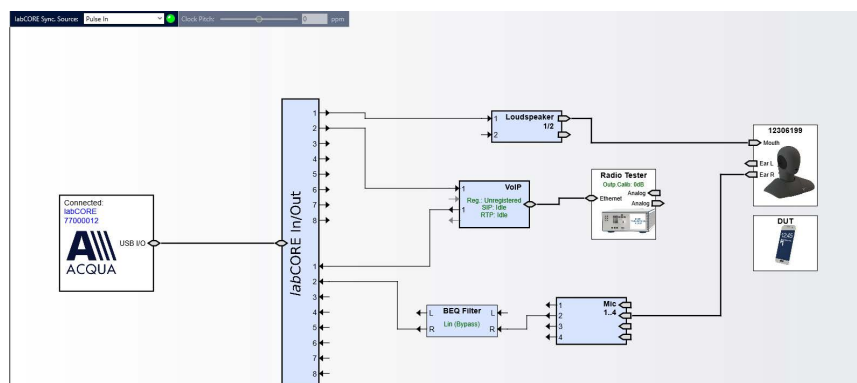
4.4.2 Connection Procedure

ACQUA Computer: Hardware Configuration

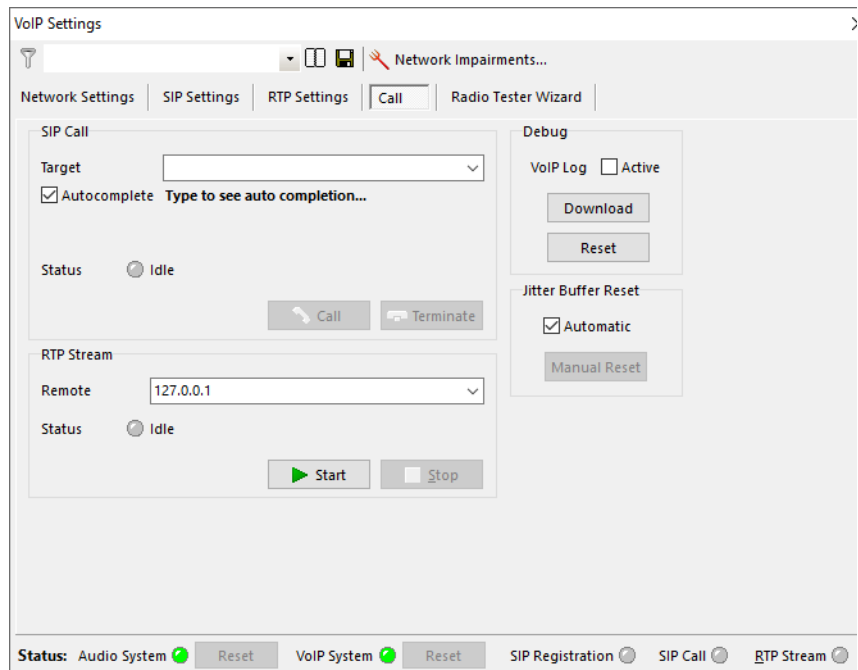
1. Start Hardware Configuration.
2. Select *lab*CORE and build the configuration.



3. Select the **VoIP** block.

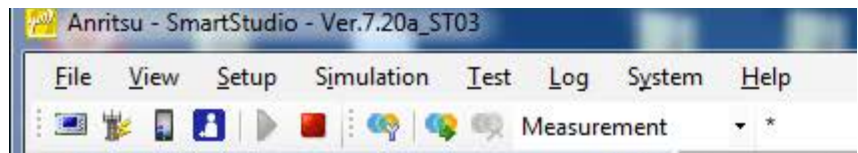


4. Select the **Call** tab.
5. Enable **Automatic Jitter Buffer Reset**.

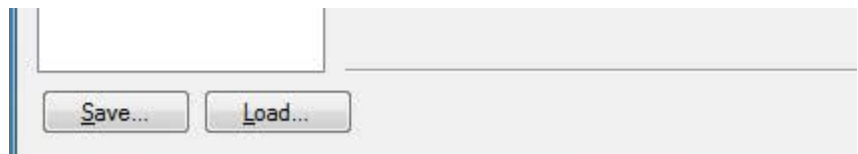


Anritsu MD8475B: Connection Parameters

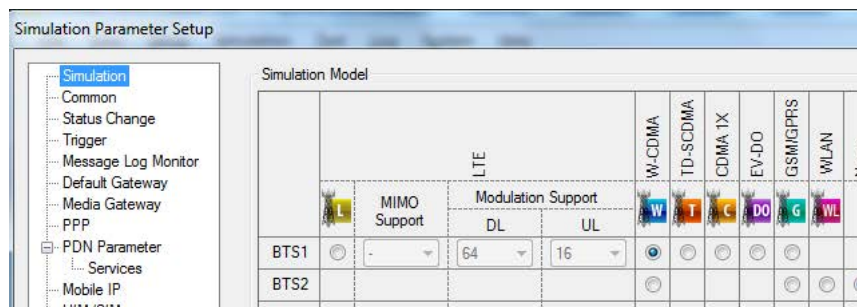
1. Open SmartStudio© on Anritsu MD8475B.
2. Select  to open **Simulation Parameter Setup**.



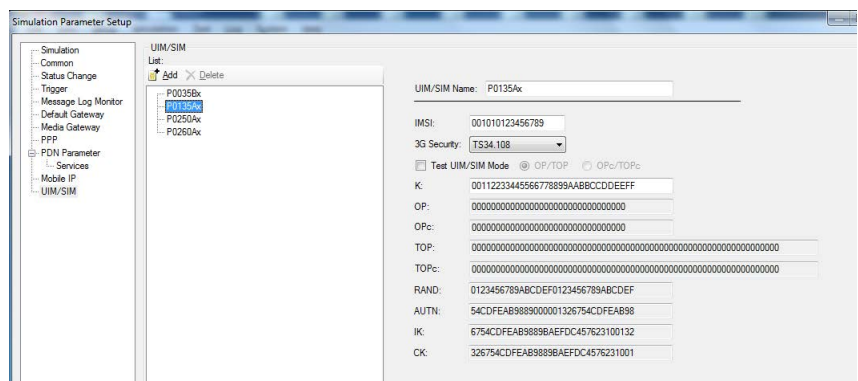
3. If available, load existing **Simulation Parameter Setup** by selecting **Load**.



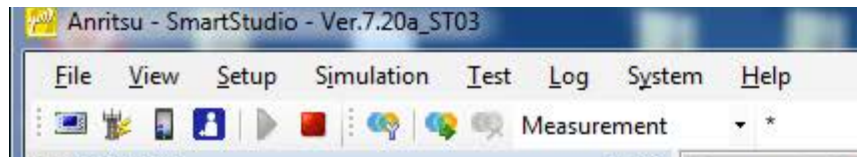
4. Select **Simulation**.
5. Set **Simulation Model** to **W-CDMA**.
6. Select **UIM/SIM**.



7. Check if the UIM/SIM settings apply to the SIM card of the DUT.
8. If desired, save the **Simulation Parameter Setup** by selecting **Save**.
9. Confirm **Simulation Parameter Setup** by selecting **OK**.



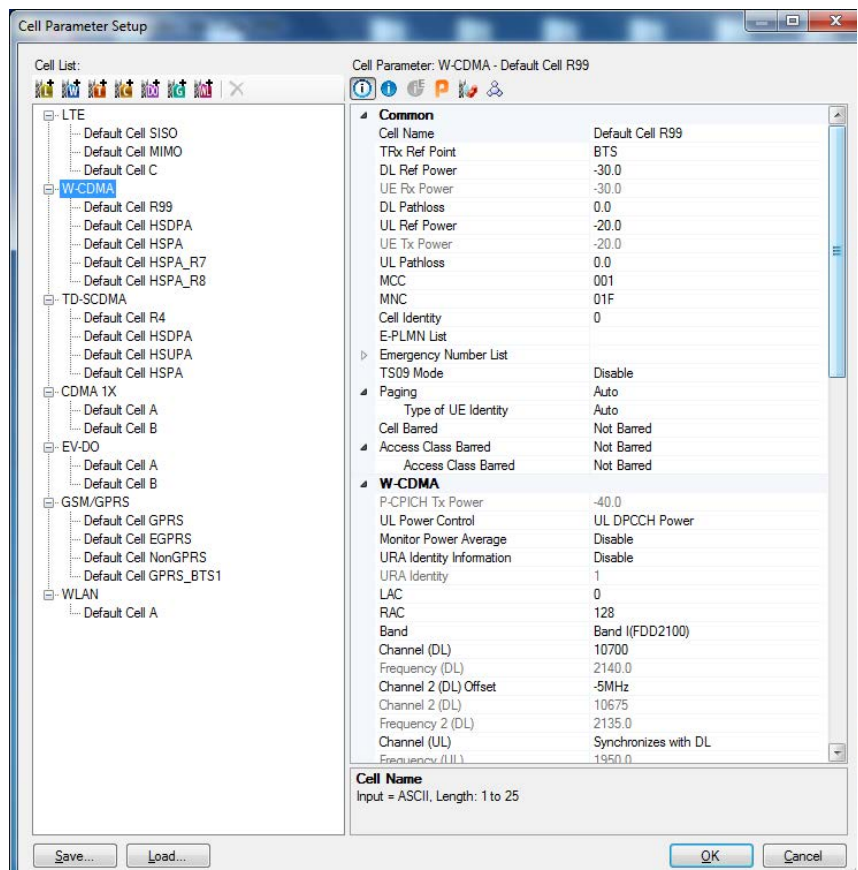
10. Select  to open **Cell Parameter Setup**.



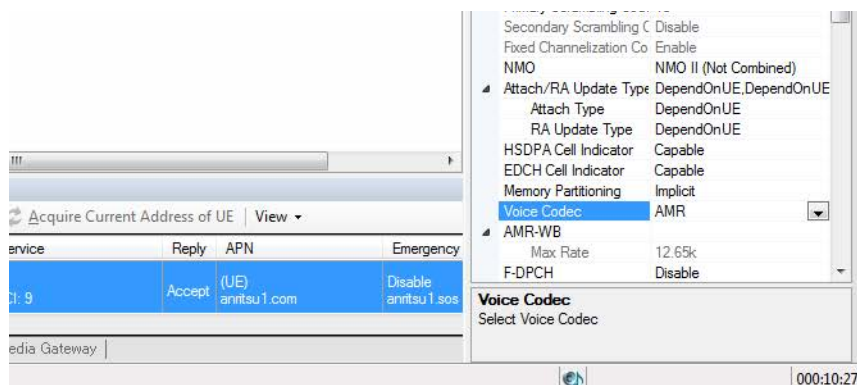
11. If available, load existing **Cell Parameter Setup** by selecting **Load**.



12. Select **W-CDMA** from the **Cell list**.
 13. Unfold **Common** in **Cell parameter**.
 14. Set the external attenuation (**DL Ref Power** and **UL Ref Power**). It shall match the attenuation of the RF antenna and the antenna cable.
 15. Set the network identity **MCC** according to SIM card preferences.
 16. Set the network identity **MNC** according to SIM card preferences.
 17. If desired, save the **Cell Parameter Setup** by selecting **Save**.
 18. Confirm **Cell Parameter Setup** by selecting **OK**.

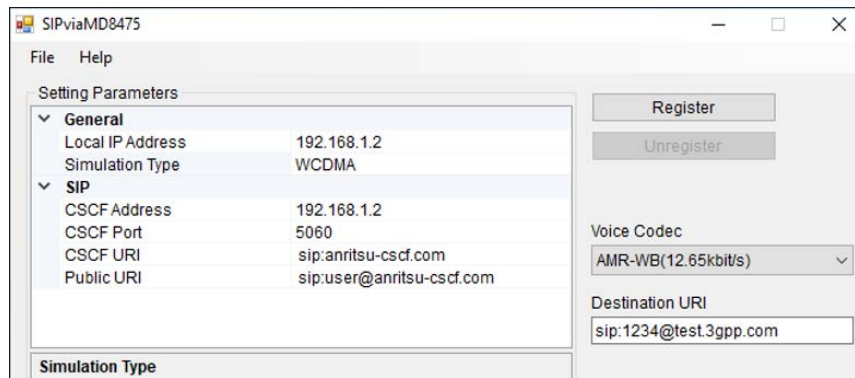


19. Select the desired GSM voice codec in SmartStudio©.

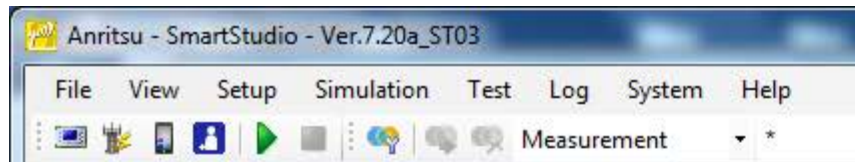


#

20. Open **SIPviaMD8475**.
21. Set **WCDMA** as **Simulation Type**.
22. Set desired codec as **Voice Codec** consistent to SmartStudio©.
23. Select **Register**.

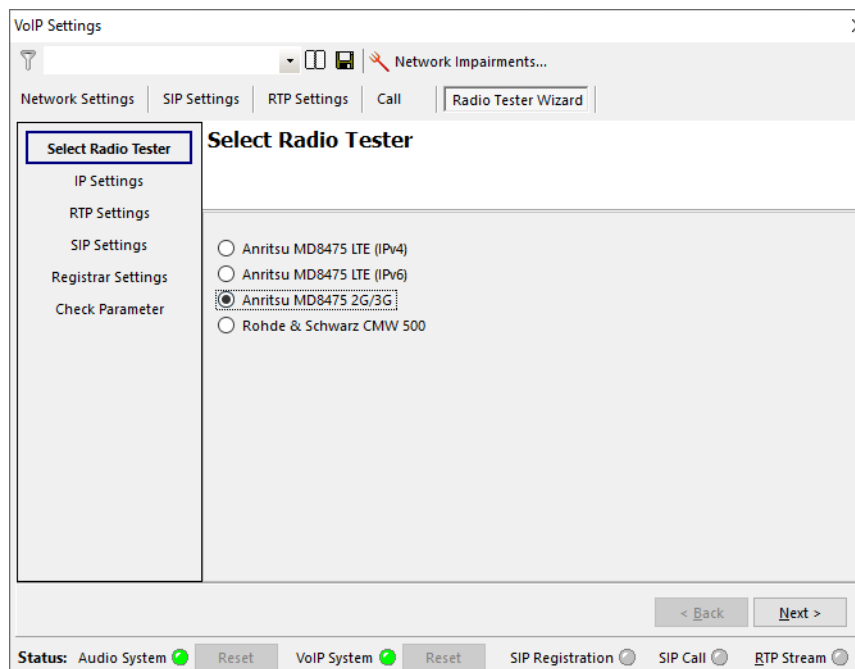


24. Go to SmartStudio©.
25. Select  to start the simulation.



ACQUA Computer: Radio Tester Wizard

1. Select the **Radio Tester Wizard** tab.
2. Select **Anritsu MD8475 2G/3G**.



3. Select **IP Settings**.
4. Enter/verify the **IP Settings**.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings**
- RTP Settings
- SIP Settings
- Registrar Settings
- Check Parameter

IP Settings

IP: 192 . 168 . 1 . 101

Subnet Mask: 255 . 255 . 0 . 0

Gateway: 192 . 168 . 1 . 2

DNS: 0 . 0 . 0 . 0

< Back Next >

Status: Audio System ● Reset VoIP System ● Reset SIP Registration ● SIP Call ● RTP Stream ●

5. Select **RTP settings**.
6. Enter a suitable **Initial jitter buffer length**. Default setting is 140 ms.
7. Select the voice codec in accordance with **SIPviaMD8475**.

VoIP Settings

Network Settings | SIP Settings | RTP Settings | Call | Radio Tester Wizard

Select Radio Tester

- IP Settings
- RTP Settings**
- SIP Settings
- Registrar Settings
- Check Parameter

RTP Settings

General

Initial jitter buffer length: 140 ms

Packet Length: 20 ms

Codec Configuration

Codec: AMR

Encoder Param.: octet-align=1;fixed-local-mc

FMTP: octet-align=1;max-red=0

< Back Next >

Status: Audio System ● Reset VoIP System ● Reset SIP Registration ● SIP Call ● RTP Stream ●

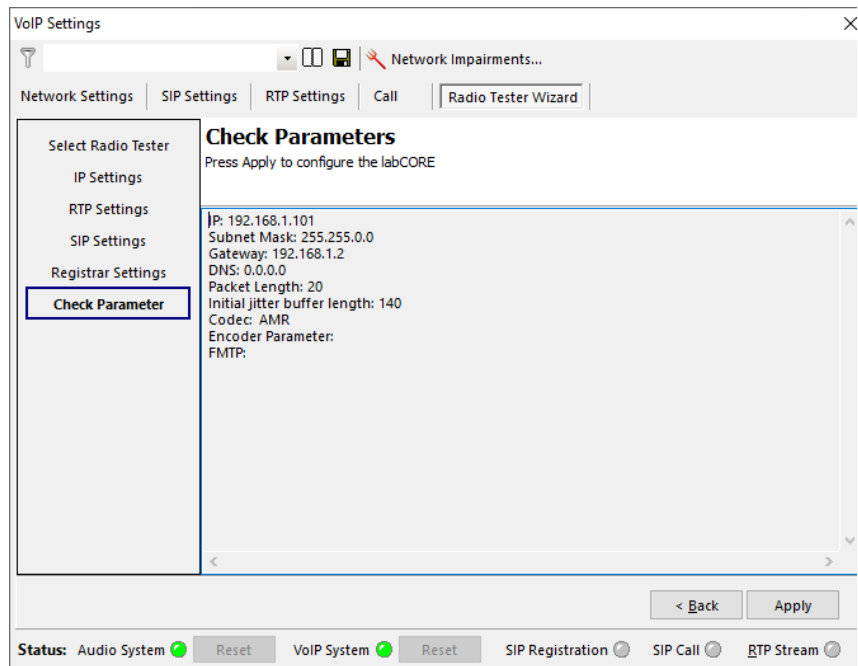
8. Select **SIP Settings**.
9. Enter/verify the **SIP Settings**.

The screenshot shows the 'VoIP Settings' application window. The left sidebar contains a menu with options: 'Select Radio Tester', 'IP Settings', 'RTP Settings', 'SIP Settings' (highlighted with a blue border), 'Registrar Settings', and 'Check Parameter'. The main area is titled 'SIP Settings' and contains two input fields: 'SIP Port' with the value '7060' and a dropdown menu set to 'UDP', and 'Contact' with the value 'sip:1234@192.168.1.101:7060'. At the bottom, there is a status bar with indicators for 'Audio System' (green), 'VoIP System' (green), 'SIP Registration' (grey), 'SIP Call' (grey), and 'RTP Stream' (grey). Navigation buttons '< Back' and 'Next >' are visible.

10. Select **Registrar Settings**.
11. Enter/verify the **Registrar Settings**.

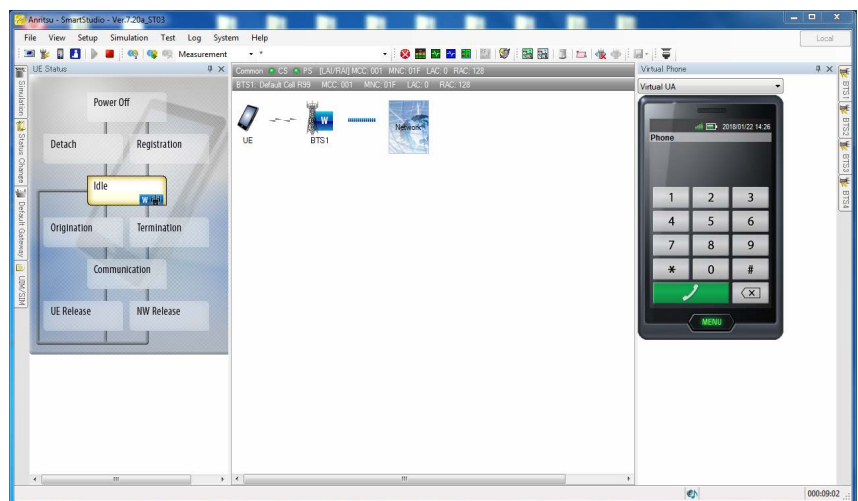
The screenshot shows the 'VoIP Settings' application window with the 'Registrar Settings' screen selected. The left sidebar menu is the same as in the previous screenshot, but 'Registrar Settings' is now highlighted with a blue border. The main area is titled 'Registrar Settings' and contains several input fields: 'Server Address' (192.168.1.2:5060), 'User ID' (1234), 'Password' (empty), 'Identity' (sip:1234@test.3gpp.com), 'Contact Parameter' (empty), and 'Outbound Proxy' (empty). The status bar at the bottom remains the same, showing 'Audio System' (green), 'VoIP System' (green), 'SIP Registration' (grey), 'SIP Call' (grey), and 'RTP Stream' (grey). Navigation buttons '< Back' and 'Next >' are visible.

12. Select **Check Parameter**.
13. Verify all set parameters.
14. Select **Apply** to register the *labCORE* at Anritsu MD8475B.



Anritsu MD8475B: Call Execution

1. Go to the SmartStudio© main screen. The status of the DUT (UE status) is **Idle**.



2. Enter any number (e.g., 123) on the keypad of the virtual phone on the screen.
3. Select the green call button to initiate the call. The radio tester waits for the call acceptance of the DUT.



4. Accept the call at the DUT.
5. The status of the DUT switches from **Termination** to **Communication**.

