# Anite

# ANITE S-CORE APPLICATION TESTING

# **GETTING STARTED GUIDE**

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#### **Customer support**

It is our goal to provide you with excellent Customer Support. To request assistance with any aspect of your Anite test system, please create a Help Desk Request (HDR) using the Anite Help Desk. For other queries, please email <u>customersupport.di@keysight.com</u>.

To access the Anite Help Desk, and to download the latest software releases, please log in to <u>myKeysight</u>. On the myKeysight home page, in the Quick Links box, click the link for the Anite Help Desk, or click Keysight Software Manager for software downloads.

#### **Document history**

The following table lists the main changes to issues of this document.

Issue	Date	Summary of Changes
2.0	Feb 2016	Updated for GUI version 3.185 and above.
3.0	May 2016	Updated for WLAN Test Accelerator setup instructions.
4.0	Sep 2016	Minor updates.
5.0	May 2017	Added section VZW IMS registration test case information and S-CORE GUI configuration for single cell.



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# **1** INTRODUCTION

Anite S-CORE Application Testing offers LTE-IMS device application testing for Wi-Fi offload, VoLTE, RCS, Voice over Wi-Fi and other application and IMS based services.

The S-CORE is a stand-alone test platform with an integrated LTE-IMS radio and network subsystem and it includes an application test suite, a rich and fully-featured user interface and a wide portfolio of test case packages, enabling rapid operator acceptance and device certification.

### 1.1 Scope

This guide is designed to help you set up your S-CORE test platform and start running its test plan packages as quickly as possible.

### **1.2 Related documents**

For more information about the S-CORE product, refer to the Anite S-CORE Operating Manual.



# **2** S-CORE TEST SYSTEM OVERVIEW

This section describes the units in the S-CORE test system.

**Caution:** Please refer to the **Safety Instructions** section in the Anite S-CORE Application Testing: Operating Guide before starting to connect the S-CORE.

# 2.1 S-CORE Connect

#### **Front View**



LED Indicators USB Ports Power Button

Table 1	Front	view	panel
---------	-------	------	-------

LED Indicators			
1. Session Active LED Indicator	<ul> <li>LED green – indicates that a session has been established with an external connection. The LED will be green as long as the session remains connected.</li> <li>LED off – indicates that no session has been established with the test system.</li> <li>LED orange — indicates that a session has been established with the test system and the session is locked.</li> </ul>		
2. Status LED Indicator	<ul> <li>LED green – indicates that the test system is in the ready state and has no errors in the queue.</li> <li>LED orange – indicates that the error/event queue is not empty.</li> <li>LED red – indicates a serious fault in the test system.</li> </ul>		
3. Streaming port 1B LED Indicator	LED orange – indicates that the test system is in		

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LED Indicators				
4. Streaming port 1A LED Indicator	duplex (bi-directional).			
5. RF port 1B LED Indicator	only.			
6. RF port 1A LED Indicator	<b>LLD green</b> - indicates that test system is in input-only.			
Others				
7. Two USB Ports	Reserved for field service use.			
8. Power Button with LED Indicator	<ul> <li>Power on/off switch:</li> <li>LED off - indicates that the test system has no power.</li> <li>LED red - indicates that the test system is in standby mode.</li> <li>LED blinking green - indicates that the test system is booting.</li> <li>LED green - indicates that the test system is on. Please wait few seconds before starting the S-CORE GUI.</li> </ul>			
Streaming Ports				
9. Streaming Port 1B	Provides uni-directional output RF connection to the			
10. Streaming Port 1A				
RF Ports				
<b>11.</b> RF Port 1B – VSG/VSA Port Provides input/output RF connection to DUT GSM, W-				
12. RF Port 1A – VSG/VSA Port				



#### S-CORE rear view



#### Table 2Rear view panel

Cell Sync Ports		
13. Cell Sync Port In	For synchronisation of multiple S-CORE boxes.	
14. Cell Sync Port Out		
Trigger Ports I/O		
15. Trigger 2 I/O	Provides connection for signal trigger input and signal	
16. Trigger 1 I/O		
LAN Ports		
<b>17.</b> LAN Port 1	RJ-45 connection type for connecting S-CORE test system with the TP-Link Router or WLAN Test Accelerator.	
Others		
18. Status LEDs	Display which Radio Access Technologies are currently installed and being used.	
19. Test Station Interconnect	For connecting multiple S-CORE test systems.	
Trigger Ports I/O		
<b>20.</b> Trigger 1 I/O	Provides connection for trigger input #1	
<b>21.</b> Trigger 2 I/O	Provides connection for trigger input #2	
<b>22.</b> Trigger 3 I/O	Provides connection for marker output #1	

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Cell Sync Ports			
<b>23.</b> Trigger 4 I/O	Provides connection for marker output #2		
LAN Ports			
<b>24.</b> LAN Port 2	RJ-45 connection type for connecting S-CORE test system with the TP-Link Router or WLAN Test Accelerator.		
Others			
25. Two USB Ports	Used for connecting to the external devices		
26. VGA Video Output	Video output for connecting monitor with S-CORE.		
10MHz Reference Connectors			
27. 10MHz Reference Output	Provides 10MHz reference output connection.		
28. 10MHz Reference Input	Provides 10MHz reference input connection.		
Power Ports			
<b>29.</b> Power Switch	AC on/off switch.		
<b>30.</b> Power Input	Used for connecting to the AC main power.		
Others			
31. Serial Number	S-CORE Serial Number.		



# 2.2 TP-Link Router

The delivery of the S-CORE test system may contain a TP-Link router, which is pre-configured with the correct settings and is ready to use.

**Front View** 



**Rear View** 



#### Table 3 TP-Link Router panel

Button/Port		Description		
1.	Power	Used for connecting to the AC main power adapter.		
2.	Reset Button	Holding down this button for 5 to 10 seconds will reset the wireless router back to the default TP-Link factory settings. It is recommended to contact support team before resetting router.		
3.	LAN	RJ-45 connection type for connecting TP-Link router with LAN.		
4.	Ethernet 1 4	RJ-45 connection type for connecting TP-Link router with the S-CORE and the user's PC.		

The TP-Link router is delivered pre-configured (DHCP server enabled) to be used with the S-CORE. In most cases, it is unnecessary for the user to change the router configurations. You can change the IP Address of the TP-Link Router, as described in section A2.



# 2.3 Anite WLAN Test Accelerator

The delivery of the S-CORE test system may contain an Anite WLAN Test Accelerator, which is preconfigured with the correct settings and is ready to use.

#### Front and Rear view



The relevant buttons/ports on the Anite WLAN Test Accelerator are shown above and described in the following table.

Table 4	Anite	WLAN	Test	Accelerator	panels
					P

Button/Port	Description
Power button	To power the unit into and out of standby mode. The button lights up when power is supplied to the unit. The colours denote the following modes: Orange light: The unit is in standby mode. Green light: The unit is in normal operating mode.
RF antenna ports	Convey antenna 1-4 (ANT 1 – ANT 4) RF signal to and from the device under test.
Ethernet ports	RJ-45 connection for connectivity to the S-CORE Connect unit and the Test System PC.
Power inlet switch	Switches the power to the unit. Switching this off isolates the unit from the mains supply.



# 2.4 Test System PC system requirements

The following table shows the system requirements for the Test System PC connected to the S-CORE test system.

 Table 5
 Test System PC requirements

Item	Requirement			
Adobe Flash Player	Version 10.3			
Processor	Dual Core CPU			
Recommended Speed	2.5GHz			
Memory	2GB of RAM or higher			
Available Hard Disk Space	500MB of available hard disk space (for storing wave files, capturing data or log files)			
Screen Resolution	1024x768 resolution			
LAN	100 Base-T LAN (1000 Base-T preferred)			
Browser	Default browser installed			
Operating System	Windows based system			



# **3 GETTING STARTED**

This section will help you set up the system and get it ready for testing including cabling the test system and installing the required software.

# **3.1 Connecting the S-CORE Test System**

This section describes how to connect the S-CORE unit, Test System PC and WLAN Router (TP-Link Router or Anite WLAN Test Accelerator).



The S-CORE test system can be configured using either a TP-Link Router or an Anite WLAN Test Accelerator. When supplied by Anite, the TP-Link Router and WLAN Test Accelerator are preconfigured for use in the S-CORE test system.

The following sections describe how to cable the units in the S-CORE test system using a TP-Link router (section 3.1.1) or a WLAN Test Accelerator (section 3.1.2).



#### 3.1.1 TP-Link Router Setup



#### **Cabling Instructions**

Connect the cables for the S-CORE test system using a pre-configured TP-Link router as follows:

- 1. Use an RF cable to connect the Device Under Test (or an Antenna Coupler) to the RF Port 1A (section 2.1 [12]) on the front of the S-CORE Connect unit.
- Optionally, connect a VGA Cable to the back of the S-CORE unit (section 2.1 [26]) and into a monitor to display the S-CORE Monitor GUI, which is useful for troubleshooting. For more information, see section A1.
- Connect one end of two LAN cables to the LAN Port 1 (section 2.1 [17]) and LAN Port 2 (section 2.1 [24]) connections on the back of the S-CORE unit, and connect the other ends of the LAN cables to Ethernet ports on the back of the TP-Link Router (section 2.2 [4]).

**Note:** It is important to connect both LAN cables before using the system.

- **4.** Connect a LAN cable from the Ethernet port [4] on the back of the TP-Link Router to the network card in the back of the Test System PC.
- Connect the S-CORE to mains using a three-prong AC power cord and into a grounded power socket. The power input connector (type IEC 322) is located on the back of the unit (section 2.2 [30]).

**Note:** Once the power input connector is switched on, you must not remove the power cable or switch the power input connector to the off position when turning off the unit. Always use the power button on the front of the S-CORE Connect unit.

**6.** Press the power button (section 2.1 [8]) on the front panel of the S-CORE to switch it on and the Power LED Indicator will start blinking green. This means that the system is booting up.

When the system is up, the Power LED Indicator is green and the Status LED (section 2.1 [2]) will be green.

#### **IP Address Configuration**

Configure the LAN port of your PC to obtain IP Address automatically so that the IP Address of your PC will be assigned automatically by the DHCP server of the TP-Link Router as follows:

- 1. Display the network connections form Start > Control Panel > Network and Internet > Network Connections.
- 2. Right-click on the network connection for the TP-Link router and select **Properties**.
- 3. Select Internet Protocol Version 4 (TCP/IPv4) from the list of items used by the connection and click Properties.



- 4. Select Obtain an IP address automatically.
- 5. Click **OK** to confirm the changes.

## 3.1.2 WLAN Test Accelerator Setup



#### **Cabling Instructions**

Connect the cables for the S-CORE test system using an Anite WLAN Test Accelerator as follows:

- 1. Use an RF cable to connect the Device Under Test (or an Antenna Coupler) to RF Port 1A (section 2.1 [12]) on the front of the S-CORE Connect unit.
- Optionally, connect a VGA Cable to the back of the S-CORE unit (section 2.1 [26]) and into a monitor to display the S-CORE Monitor GUI, which is useful for troubleshooting. For more information, see section A1.
- Connect one end of two LAN cables to the LAN Port 1 (section 2.1 [17]) and LAN Port 2 (section 2.1 [24]) connections on the back of the S-CORE unit, and connect the other ends of the cables to Ethernet ports on the back of the Anite WLAN Test Accelerator (section 2.3).

**Note:** It is important to connect both LAN cables before using the system.

- **4.** Connect a LAN cable from the Ethernet port [4] on the back of the WLAN Test Accelerator to the network card in the back of the Test System PC.
- **5.** Connect an RF cable with a Wi-Fi antenna on one end to the Ant 1 N-Type connector on the front of the Anite WLAN Test Accelerator unit. The antenna on one end should be positioned close to the UE or the coupler.
- Connect the S-CORE to mains using a three-prong AC power cord and into a grounded power socket. The power input connector (type IEC 322) is located on the back of the unit (section 2.2 [30]).

**Note:** Once the power input connector is switched on, you must not remove the power cable or switch the power input connector to the off position when turning off the unit. Always use the power button on the front of the S-CORE Connect unit.

**7.** Press the power button (section 2.1 [8]) on the front panel of the S-CORE to switch it on and the Power LED Indicator will start blinking green. This means that the system is booting up.

When the system is up, the Power LED Indicator is green and the Status LED (section 2.1 [2]) will be green.



#### **IP Address Configuration**

Configure the LAN port of your PC to obtain IP Address automatically so that the IP Address of your PC will be assigned automatically by the DHCP server of the WLAN Test Accelerator as follows:

- 1. Display the network connections from **Start > Control Panel > Network and Internet > Network Connections**.
- 2. Right-click on the network connection for the WLAN Test Accelerator and select **Properties**.
- 3. Select Internet Protocol Version 4 (TCP/IPv4) from the list of items used by the connection and click Properties.
- 4. Select Obtain an IP address automatically.
- 5. Click **OK** to confirm the changes.

#### **3.2 Protecting against malware attacks**

Follow the instructions below to ensure that your PC is protected against possible malware attacks:

- Check that you are using the latest S-CORE software release from Keysight.
- Protect the test system PC as follows:
  - If Keysight provided the test system PC, it will have Windows 7 with the latest updates and patches installed.
  - If you are using your own test system PC, ensure that you have taken equivalent steps to protect against malware attacks.
- Crucially, the only connection to any external network should be to the test system PC. This isolates the test system's network from any other networks and decreases the risk that equipment on a test system will be exposed to attacks such as WannaCry.

### 3.3 Installing The S-CORE GUI

To install the S-CORE GUI on the Test System PC, follow the steps below:

- 1. Close all S-CORE related applications.
- 2. (Optional) Uninstall the previous version of the S-CORE GUI as follows:

**Note:** Uninstalling the previous version will delete any settings saved in the previous GUI. You can also choose to install the new version without uninstalling the previous version.

- **a.** Start the previous S-Core GUI and log in.
- **b.** Export all the RF settings/Application option settings (e.g. VOIP, RCS application-related settings) by navigating to the application and selecting **Export** as shown below.

Anite S-CORE VoIP BTS 1 LTE-F	DD options [10.23.205.21] ]	- r	Anite S-COREVoIP options [10.2	3.205.21]
Main PDN1 PDN2 P	DN3 PDN4 P-CSCF/DNS Settings SI		NW&Client Emulated UE1	Emulated UE2 Emulated UE3 Emula
Mode	SISO		Network Type	SCORE LTE
Bandwidth	10 MHz 🔹		Core NW Address	10.23.204.21
Francisco Parad	10		P-CSCF IP Address	2600:2:5:6:3:1:205:1921
Frequency Band	13		Mobile IP address	2600:2:5:6:3:1:206:1921
UL Frequency (MHz)	782		Public User ID	sip:+11234567890@vzims.com
DL Frequency (MHz)	751		Telephone URI	tel:+11234567890
Rx Power (dBm)	20		Private User ID	+11234567890@vzims.com
Tx Power (dBm)	-30		Auth Type	GIBA
External Attenuation (dB	10		Realm	anite.com
External Attendation (ab	FPC Only		DUT Password	scoreconnect
EPS Attach Type	EPS Only		Mobile Directory Number (MDN)	+1234567890
UE Category	CAT1 _		IMSI	311480123456789
			IMEI	35767006-230598-0
Refresh Default			External RF IP	10.23.202.115
		-1	Tested Mobile	test
			Apply & Close	ort 📄 Import 🔰 Exit

c. Uninstall the previous version of the S-CORE GUI.



After you install the new version, you can then **Import** the settings exported from the previous S-Core GUI application.

**3.** Insert the GUI Installation DVD included in the delivery package into your computer's DVD drive and click on the S-CORE GUI setup program.

Follow the on-screen instructions to install the GUI and update all the default files.

**Note:** It is strongly recommended to install the S-CORE GUI to a folder where the user has full control permissions.

- **4.** Once the GUI is installed, a shortcut will be created on your desktop.
- **5.** Before logging in with the GUI, wait for five minutes from when the S-CORE has been powered ON. Logging in early will trigger the GUI to display an error message "connection refused". Should this occur, please wait for another minute and try to log in again.

Once the GUI has been installed on your work station you can easily manage test campaigns, run tests and record results remotely.

#### Important notes:

- Always use the front panel Power Button (section 2.1 [8]) to restart the S-CORE test system.
- **Do not** switch off the S-CORE system using the power button on the rear of the unit.
- If you have an optional monitor connected to the S-CORE, **do not** use the Restart Instrument button available in the S-CORE Monitor GUI (see section A1).

Incorrect shutdown or restarting of the unit could lead to abrupt power loss, which may cause file system errors.

### **3.4 Updating software packages**

Updating or installing new software packages can be performed in two different methods depending if the GUI is available or not. Below is a simple explanation of these two methods, for further assistance please refers to the *Anite S-CORE Application Testing: Operating Guide*.

To update S-CORE software packages, follow these simple steps which should be performed one package at a time:

- 1. Download the latest packages from the Keysight Software Manager, which is accessible through <u>myKeysight</u>, and save on your local workstation.
- 2. If GUI is available please refer to Step a, if not please perform Step b.

#### a. Using Package Manager

The Package Manager menu item could be accessed from the Tools menu, prompting the Package Manager window. Clicking on the Upload button opens the Choose Files window. Continue with Step 3.

#### b. Using GUI Login Screen

when installing software packages for the first time after installation of Application server or installing new license file when existing one is expired, open the S-CORE GUI, click on Install button (If Install button is not available, Hold the Alt key and press the **Login** button). The GUI will display a prompt; Clicking **Yes** will prompt the Choose Files window from where the user can select the packages to install. Refer to the next step. Clicking **No** will close the message box and cancel process.

**3.** From the Choose Files window select one of the packages downloaded, since every package should be installed separately. The latest version will automatically replace older packages.



Choose files			-	×
◯ ◯ ▽ 🚺 ト temp	<b>- - + + + + + + + + + +</b>	Search temp		Q
Organize 🔻 New folder			-	
Favorites     Favorites     Favorites     Desktop     Downloads     Recent Places	0 0 0			
<ul> <li>□ Documents</li> <li>□ Music</li> <li>□ Victures</li> <li>□ Videos</li> </ul>				
Computer Local Disk (C:) TESTING (F:) groups (\\myanit				
File <u>n</u> ame:	•	Package Files	(*.tbz)	▼ ancel

**4.** The user will be notified with a pop-up message from the server (after first login when following Step b) when the package has been installed successfully.

Server message			The Mar. 1	8 X
		ΝΟΤΕ		
sc	oreconnect_voipt	c4-1.8.0-RC20.tbz :	successfully instal	led.
		ОК		

5. After successful installation, repeat Step 2 for every package individually.

Notes:

- If the package version to be installed is the same as your current package version, a different
  installation procedure should be performed: first remove the currently installed package and
  then upload the other package. After successful installation of the package, you will be notified.
- Reboot the system after 3 minutes to make sure installation of packages is ready.

## **3.5 Installing the S-CORE External RF Controller**

The Anite External RF Controller installs macros required by some scripts.

**Important note:** Before installing the S-CORE External RF Controller, ensure that the S-CORE GUI is installed as described in section 3.3.

To install the S-CORE External RF Controller:

- 1. Download the **S-CORE External RF Controller** zip from the Keysight Software Manager, which is accessible through <u>myKeysight</u>, and save it on the Test System PC.
- 2. On Test System PC, extract the downloaded file and run the application:

#### SCORE\_External\_RF\_Controller\_<version>.exe

Where <version> is the version number of the application. The following dialog is displayed.



Instructions:			x
	Please select path to Macros folder of S-CORE GUI.		*
	Destination folder  C:\Program Files (x86)\Anite\S-CORE\Macros	Bro <u>w</u> se	
	Extract	Cancel	

**3.** Click **Browse** to select the **Destination folder** to which the application extracts the required files. The location must be set to one of the following:

C:\Program Files (x86)\Anite\S-CORE\Macros (for 64-bit Windows PCs)

C:\Program Files\Anite\S-CORE\Macros (for 32-bit Windows PCs)

4. Click **Extract** to extract the required files to the Macros folder.



# **4 START TESTING USING S-CORE**

Double Click on the **"S-CORE GUI"** icon on the desktop and the following login screen will pop up:

22<sup>nd</sup> May 2017

Anite S-CORE Applications Testing	
	Anite
	Login procedure

	Anite S-CORE v. 3.185		
Applications Server IP 10.23.205.21	Username Password	admin	
Remember		Exit	Login

Enter the S-CORE Application Server IP address, username and password. The default Application Server IP Address, Username and Password are listed below:

IP Address: 10.23.205.xx (IP of your Application Server) Username: admin Password: Fen8Geng

'xx' are the last two digits of the S-CORE serial number marked on the back panel [31].

For example, if the serial number marked on the back panel of the S-CORE is IQXS1921, the IP address would be 10.23.205.21.

Please refer to the **System Configuration** document for more information on your S-CORE configuration.



Anite S-CORE Applications Testing	[10.23.205.21]				Α	nite	
			Choose	Test Plan			
		Voice overIP (VoIP)			Start	Logout	Exit
	ATC	Browsing		DM	DRI	M	
DW	Email	IMS	) Java	MFBI	MM	s S	
MS	MultiAE	PTN	RCS	Streaming	SUF		
VoIP	WiFi Offload						
		To test Voce	e Over IP testcases				

The applications available will be highlighted depending on the purchased packages. Select the application you wish to test by pressing the **"Start"** button by double clicking on the application icon.



NW&Client	Emulated UE1	Emulated UE2 Emulated UE3 Emula					
Netw	ork Type	SCORE LTE					
Core NW Address P-CSCF IP Address Mobile IP address Public User ID		10.23.204.21	10.23.204.21				
		2600:2:5:6:3:1:205:1921					
		2001:2:5:6:3:1:206:1921					
		sip:+11234567890@vzims.com					
Telephone URI		tel:+11234567890					
Private User ID Auth Type		+11234567890@vzims.com					
		GIBA					
R	ealm	anite.com scoreconnect I) +1234567890					
DUT F	assword						
Aobile Directo	ry Number (MDN)						
1	MSI	311480123456789					
1	MEI	35767006-230598-0					
Exter	nal RF IP	10.23.202.115					
Teste	d Mobile	test					

Enter application specific settings as required in application option window. E.g. VOIP Options:

Network Type:SCORE LTECore Network Address:10.23.204.xx (IP of signalling card)P-CSCF IP Address:2600:2:5:6:3:1:205:xxxxMobile IP Address:2001:2:5:6:3:1:206:xxxx



estcase /	(1) Title	👪 Group	📥 Client				
TE-BTR-1-5400	Combined attach,	ATT VOIP	Client Device				
TE-BTR-1-5402	Combined attach,	ATT VOIP	Client Device				
TE-BTR-1-5404	Power-up registrati	ATT VOIP	Client Device				
TE-BTR-1-5406	Power-up registrati	ATT VOIP	Client Device				
TE-BTR-1-5408	IMS De-registration	ATT VOIP	Client Device				
TE-BTR-1-5410	IMS Toggle function	ATT VOIP	Client Device				
TE-BTR-1-5436	UE will present call	Basic Call Tests	Client Device				
TE-BTR-1-5438	UE will hide caller I	Basic Call Tests	Client Device				
TE-BTR-1-5440	UE sends 486 Bus	Basic Call Tests	Client Device	-			
• [			1	·			
LTE-BTR-1-5400							
	Title: Combined attach, Power-up registration, eUTRAN, Voice over PS supported Description: Combined attach, Power-up registration, eUTRAN, Voice over PS supported, IPv6, IPSec						
Fitle: Combined attach, F	<sup>D</sup> ower-up registration, eU	TRAN, Voice over PS	supported				

In this next step, select the test case you wish to run from the list indicated as shown in this screen shot then click on the **Add to campaign** button.

Click on **Close** to go to the next screen.

In the main S-CORE GUI, user can switch on the RAT (GERAN, WCDMA or LTE). Refer to the next chapter for the RAT handling. If the selected RAT is in the mode ON, power on the DUT and wait until the DUT camps on the RAT.

Main	Anite S-COREVoIP C	ampaign - new [10.23.205.21]							
1enu —	Eile Tools Campaig	n <u>V</u> iews <u>H</u> elp							
		Voice ov	ver IP					Anite	
		😹 Testcase	Verdict	🌒 Title			👪 Group	User@IP : admin@10.23.200.160	
	Switch Test Plan	VZW-VoWiFi-LC3-01b		MO Video (	call		VZW VoWi	Network Type : SLORE 3G Network Address : 10.23.204.21	
	Switch Test Plan	VZW-VoWiFi-LC3-02a		MT Video c	all		VZW VoWi	Mobile IP : 2600:2:5:6:3:1:206:1956	
	S Logout	VZW-VoWiFi-LC3-03a		MO Voice (	Call		VZW VoWi	lested Mobile : Unknown	
	TOPul	VZW-VoWiFi-LC3-03b		MO Voice (	Call		VZW VoWi	TC VZW-VoWiFi-LC3-01b.c launched at 2015-06-25, 00:10:42	
		VZW-VoWiFi-LC3-04a		MT Voice C	all		VZW VoWi	Testcase Version : 1.9	
	Editable TC Pool.	VZW-VoWiFi-LC3-04d		MT Voice C	all		VZW VoWi	Package Version : VoIPTC5 V1.8.0-RC15	
	-	VZW-VoWiFi-LC3-05a		MO Video (	call, accept as a voice call		VZW VoWi	S-CORE RF Tracer is not opened. To canture the RF trace, open the RF	
	PICS Pool	VZW-VoWiFi-LC3-06a		MT Video c	all, accept as a voice call		VZW VoWi	Tracer by clicking	
	CAMP Pool	VZW-VoWiFi-LC3-06b		MT Video c	all, accept as a voice call.		VZW VoWi	Launch Tracer option in the GUI before running the test case.	
		VZW-VoWiFi-LC3-07b		On Voice C	all, add a another voice call.		VZW VoWi	Hannah Scone ni nace vescrior disteaders visio	
iews	MSG Pool	VZW-VoWiFi-LC3-08d		On Voice C	all, receive a another voice call		VZW VoWi	Software engineered by Anite.	Act
ar	💑 Legal Ontions	VZW-VoWiFi-LC3-09d		On Voice C	all, receive a another video call ac	cept as a voice call	. VZW VoWi	(c) Copyright - all rights reserved.	
	Local Options	VZW-VoWiFi-LC3-11b		On Voice C	all, Upgrade to video call		VZW VoWi		
	VoIP options	VZW-VoWiFi-LC3-13b		On Video c	all, receive another voice call		VZW VoWi	luming off the LTE cell	
		VZW-VoWiFi-LC3-14b		On Video c	all, receive video call accept as a	voice call	VZW VoWi	Step 1a: Verify the UUT Successful IKEv2 authentication done.	
	Statistics	VZW-VoWiFi-LC3-15b		On Video c	all, receive another video call acco	pt as a video call	VZW VoWi		
	U Macros								
	TC Logs					-			Ca
	📖 Launch Tracer								
	Automation Serve		1_		1-		•		
		Delete	Down	Up	Delete All	Select			
	I OFF LIE-FOO			VZW-VoW	iFi-LC3-01b				
		T.1.							
		Little: MO Video coll							
		WO VIGEO Call							
loning		Description:							Tes
		WiFi Only							Wir
		Preconditions: 1a. Verificities LILIT Suc	conclub IK/Ev/2 outh	contination dama. 1b. \	(orify the LILIT IMS register over W	i Ei with "Device IM	EL video		
		mmtel smsin ""CS Vo	lte" feature tag 2	a verify the Video call	establish on Wi-Fi 2b verify the	Packets from the LI	IIT start		
		using the ePDG IP as	destination 3. Veril	fy that the video packe	ets are encapsulated in ePDG IP	ackets, 4. After en	ding video		
		call, Verify the UUT stil	I IMS register over	Wi-Fi.					
			-						
		Test procedure:							
		1 Downer On the UNIT O	Initiato vidos"	from LILIT to LIE P 2	Wait for 1 minutos 4 End the Vice	oo coll			
ntrol —		1. Power On the UUT 2		1 1011 UUT to UE-B 3.	want for 1 minutes 4. End the Vic	eu call			
r									
	<b>**1</b> ON <b>(P</b> or	Run Selected	Stor		II Pause	Resume	[	Abort TC	
	ON OF	- Kun Selected	Star		III , ause	Nesume			



To start running test cases, perform the following steps:

- 1. Ensure you have selected and activated the correct PICS/EICS as follows:
  - a. Select **PICS Pool** from the menu, which displays the PICS Pool window.
  - **b.** On the PICS Pool window, select the PICS file to use and click **Set Active PICS**.
  - c. Click Close to close the dialog.
- 2. Select the required test cases to run, then click on the **Start** button to begin running test cases.

The activity window on the right side of the S-CORE GUI will give you real-time reports and instructions as the test case progresses.

Press the power button [8] at the front panel of the S-CORE to shut down the whole system.



# 5 CONTROLLING RADIO ACCESS TECHNOLOGIES FROM THE GUI

The three RATs available on the S-CORE (GERAN, LTE-FDD and WCDMA) can easily be controlled from the S-CORE GUI. They can be found exactly under the Views Bar by right clicking on RAT and then under Technology.



All installed RATs will be listed, with the currently used RAT being marked as ON.



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## 5.1 Switch ON/OFF RAT

To switch ON a particular RAT:

Click on the ON button.

	~
1 OFF LT	E-FDD
💞 ON	OFF

The S-Core GUI displays a prompt (shown below) asking you whether to proceed with the switching of the hardware.

Switch HW	8 ×
This operation will take few seconds. Proceed?	
Yes No	

- **2.** Clicking 'Yes' to start loading the selected RAT.
- 3. Wait until the mode indicator turns to green and status is changed to ON.



The RAT is now ready for use.

To switch OFF a particular RAT, click on the OFF button

#### 5.2 RF sub-system setup

The test system needs setting up for the expected RF Power levels. This setup should be as accurate as possible.

The most important parameters are the **Rx Power** and **External Attenuation**, which can be measured using external measurement equipment or can be set up carefully using the tips below. The **Tx Power** should also be set up for good radio conditions.

G OFF

**Note:** When no measurement equipment is available use the information in the following sections to properly set up the system.

Settings for each RAT can also be adjusted through the GUI by right mouse clicking on that particular RAT and choosing Settings option.



For future reference, the RF settings for each RAT (GERAN-RAT, LTE-FDD, WCDMA-RAT) can be exported to a file using the **Export** button, and these exported files can be imported using the **Import** button.

**Note:** After importing or changing the RF settings, always click **Apply** before switching on the RF cell.

The following sections display the Settings Options Windows for the three available RATs (GERAN, WCDMA and LTE).

**Note:** Specifying an RF value that is too low can lead to a Layer 1 system error (shown below), which requires the S-CORE unit to be re-booted. In this case, increase the Rx Power or decrease the external attenuation in steps of 1dBm until the S-CORE unit does not generate any Layer 1 system errors.

Server message	
ΝΟΤΕ	
RF Module Initialization failed. Reboot of the system is required. Please provide Service Logs to Support team	
ОК	

#### 5.2.1 GERAN-RAT

To change the cell settings for GERAN-RAT, right click on the cell and then select Settings of GERAN-RAT.

1 OFF GERAN-RAT		_
	Settings of 1	
	Technology →	

#### Main tab

Main IMS PDN			
Band	GSM850		
External Attenuation (dB)	20		
DL reference power:	-30		
UL reference power: 10			
MS IP address	10.23.206.21		
DNS IP address	10.23.205.21		
K value	465B5CE8B199B49FAA5F0A2EE238A6BC		
RAND	000102030405060708090a0b0c0d0e0e		
IMSI	311480123456789		
MCC	311		
MNC	480		



#### Important settings needed for testing:

#### Table 6 GERAN settings

Setting	Description
Band	Band under test
External Attenuation (dB)/Path Loss	The External Attenuation is the assumed path loss used for the setup in the uplink and downlink directions. When using conducted testing, a typical value for the external attenuation is 7dB, and this value depends on the cable length/quality and how many RF combiners/splitters and used. When using antenna couplers, the external attenuation depends on the equipment and the UE's antenna characteristics. We recommend using 15dB as a good starting point.
DL Reference Power	Downlink reference power. Lower default values when connecting directly DUT with the S-CORE. When setting the downlink reference power, use a value for a good radio connection. We recommend -30dBm as a plausible value to achieve ideal radio conditions.
UL Reference Power	Uplink reference power. Use the power class of the UE to help determine the UL reference power. A good starting point would be 12 dBm.
MS IP address	IP for mobile, it should be configured in the same subnet as the S-CORE. For more information, see the <i>Anite S-CORE Application Testing: System Configuration Guide</i> .
DNS IP address	User can configure the Application Server IP as DNS IP if the system operates in local standalone test environment.
K value, IMSI	Information of test SIM card. Refer to the System Configuration Document.
RAND	16 bytes random number for the authentication.
MCC, MNC	Mobile Country Code and Mobile Network Code that RAT will broadcast.



#### **IMS PDN tab**

Anite S-CORE VoIP BTS 1 GERAN-RAT options [10.23.205.21]					
Main IMS	PDN				
AP Nam	e VZW	[MS			
UE IP add	ress 2001	:2:5:6:3:1	:206:1921		
P-CSCF IP A	ddress 2600	:2:5: <mark>6:3:1</mark>	:205:1921		
Refresh	餋 Default	Apply	Export	🝺 Import	Close

#### Table 7 IMS PDN settings

Setting	Description
UE IP Address	IP for mobile. For more information, see the <i>Anite S-CORE Application Testing:</i> <i>System Configuration Guide</i> .
P-CSCF IP Address	Application Server IP Address. Refer to the System Configuration Document.

For detailed information about the settings, please refer to the *Anite S-CORE Application Testing: Operating Guide*. After changing the settings or starting test cases for the first time after logging in to the S-CORE GUI, first click on **Apply** and then **Switch on** the cell.

#### 5.2.2 LTE-FDD

To change the cell settings for LTE-FDD, right click on the cell and then select Settings of LTE-FDD.





#### Main tab

Anite S-CORE VoIP BTS 1 LTE-F	DD options [10.23.205.21] ]
Main PDN1 PDN2 PE	DN3 PDN4 P-CSCF/DNS Settings SI
Mode	SISO -
Bandwidth	10 MHz 🔹
Frequency Band	13 🔹
UL Frequency (MHz)	782
DL Frequency (MHz)	751
Rx Power (dBm)	20
Tx Power (dBm)	-30
External Attenuation (dB)	) 10
EPS Attach Type	EPS Only -
UE Category	CAT1 -
Refresh Default	⊘Apply

#### Important settings needed for testing:

#### Table 8LTE-FDD settings

Setting	Description
Mode	The mode that LTE RAT operates, e.g. SISO, MIMO.
Bandwidth	The bandwidth that LTE RAT operates, e.g. 10MHz.
Frequency Band	The LTE band number.
UL Frequency, DL Frequency	Values adjust automatically depending on Frequency band chosen. By default, Mid-Range values are used.
RX Power	<ul> <li>Set the value of the Expected Receive Power Level taking the following into consideration:</li> <li>The coupler or direct connection being used.</li> </ul>
	<ul> <li>The power class of the device under test. A good starting point would be 25 dBM (according to 3GPP TS 36.101, a class 3 UE should be set to 23dBm ±2dB).</li> </ul>
	• The Rx Power should be set to the maximum possible power level, and it is better to specify a slightly higher value for the Rx Power.
	Specifying a value that is too low can lead to a Layer 1 system error, which requires the S-CORE unit to be re-booted. In this case, increase the Rx Power in steps of 1dBm until the S-CORE unit does not generate any Layer 1 system errors.
TX Power	Set the value of the Transmit Power Level depending on the coupler or direct connection being used
	When setting the Tx Power, use a value for a good radio connection. We recommend -40dBm as a plausible value to achieve ideal radio conditions.
External Attenuation (Path	The External Attenuation is the assumed path loss used for the setup in the uplink and downlink directions.



Setting	Description
Loss)	When using conducted testing, a typical value for the external attenuation is 7dB, and this value depends on the cable length/quality and how many RF combiners/splitters and used.
	When using antenna couplers, the external attenuation depends on the equipment and the UE's antenna characteristics. We recommend using 15dB as a good starting point.
	It is generally better to specify an external attenuation that is slightly too low rather than too high. Specifying a value that is too high can lead to a Layer 1 system error, which requires the S-CORE unit to be re-booted.
EPS Attach Type	<ul> <li>Based on the UE capability and test requirements, select the EPS attach type in this option:</li> <li>EPS Only</li> <li>Combined Attach</li> </ul>
UE Category	Select the supported UE category to <b>1</b> or <b>4</b> .

#### PDN1 tab

Anite S-COREVo	IP BTS 1 LTE-FDD opti	ons [10.23	3.205.21]	
Main PDN1	PDN2 PDN3	PDN4	P-CSCF/DNS Settings	SIM & S€ ◀ ►
AP Name	VZWIMS			
MS IP address	2001:2:5:6:3:1:2	206:1921		
Refresh	🗞 Default	Apply	Export Dimpor	t Close

Important settings needed for testing:

#### Table 9PDN1 settings

Setting	Description
MS IP Address	IPv6 for mobile. For more information, see the <i>Anite S-CORE Application Testing:</i> System Configuration Guide.
AP Name	Please set the Access point name for the first PDN request from the device. In the above example the first PDN request is for the PDN VZWIMS



PDN2	_	PDN4	tab
			CG D

Anite S-CORERCS BTS 1 LTE-FDD options [10.23.205.21]					
Main PDN1 PDN2 PDN3 PDN4 P-CSCF/DNS Settings SIM & Se					
AP Name VZWINTERNET					
MS IP address 10.23.206.21					
Refresh Close					
Anite S-CORERCS BTS 1 LTE-FDD options [10.23.205.21]					
Main PDN1 PDN2 PDN3 PDN4 P-CSCF/DNS Settings SIM & Se					
AP Name VZWAPP					
MS IP address 10.23.207.21					
Refresh Default Apply					



Anite S-CORERCS BTS 1 LTE-FDD options [10.23.205.21]					
Main PDN1	PDN2 PDN3 PDN4	P-CSCF/DNS Settings	SIM & Se 4		
AP Name	VZWADMIN				
MS IP address	10.23.208.21				
Refresh	Default OApply	Export Import	t Close		

Important settings needed for testing:

#### Table 10 PDN2 – PDN4 settings

Setting	Description
MS IP Address	IP for mobile, it should be configured in the same subnet as the S-CORE. For more information, see the <i>Anite S-CORE Application Testing: System Configuration Guide</i> .
AP Name	Please set the Access point name for the PDN requests from the device.

#### **P-CSCF/DNS tab**

Anite S-COREVoIP BTS 1 LTE-FDD options [10.23.205.21]						
Main PDN1 PDN2	PDN3 PDN4 P-CSCF/DNS Settings SIM & St					
No. Of P-CSCF	3					
P-CSCF1 Address	2600:2:5:6:3:1:205:1921					
P-CSCF2 Address 2600:2:5:6:3:2:205:1921						
P-CSCF3 Address	2600:2:5:6:3:3:205:1921					
Primary DNS Address	2600:2:5:6:3:1:205:1921					
Secondary DNS Address 2600:2:5:6:3:1:205:1921						
Refresh 👲 Defau	Refresh Default Apply					

Perform the following on the P-CSCF/DNS tab:

1. Select the number of P-CSCF addresses that the UE requires for the test cases.



2. Set the values of the P-CSCF addresses using the IP address of the Application Server, and using the serial number of the S-CORE unit as the final four digits (1921 above).

For more detailed information about the options, refer to the S-CORE Connect Operating Manual.

#### SIM & Security tab

Anite S-COREVoIP BTS 1 LTE-FDD options [10.23.205.21]						
PDN1 PDN2	PDN3 PDN4 P-CSCF/DNS Settings SIM & Security					
MCC	311					
MNC	480					
IMSI	311480123456789					
K value	465B5CE8B199B49FAA5F0A2EE238A6BC					
RAND	000102030405060708090a0b0c0d0e0e					
Milenage	On 💌					
OP Parameter 5F1D289C5D354D0A140C2548F5F3E3BA						
Refresh	Sefault Apply					

Important settings needed for testing:

Table 11 SIM & Security settings

Setting	Description
MCC, MNC	Mobile Country Code and Mobile Network Code that RAT will broadcast.
K value, IMSI	Information of test SIM card. Refer to the System Configuration Document.
RAND	16 bytes random number for the authentication.
Milenage	Default Value - Off

For detailed information about the settings, please refer to the *Anite S-CORE Application Testing: Operating Guide.* 

After changing the settings or starting test cases for the first time after logging in to the S-CORE GUI, first click on **Apply** and then **Switch on** the cell.

#### 5.2.3 WCDMA-RAT

To change the cell settings for WCDMA-RAT, right click on the cell and then select **Settings of WCDMA-RAT**.





	Anite S-COREVoIP BTS 1 WCDMA-RAT options [10.23.205.21]						
	Main IMS PDN						
	Band	2100					
	DL FREQ	2140					
	UL FREQ	1950					
	External Attenuation (dBm)	15					
	DL reference power:	-30					
	UL reference power:	0					
	MS IP address	10.23.206.21					
	DNS IP address	10.23.205.21					
1	MCC	101					
	MNC	012					
Milenage On		On 💌					
	K value	000102030405060708090A0B0C0D0E0F					
	OP Value	5F1D289C5D354D0A140C2548F5F3E3BA					
	IMSI	1010123456789					
	Refresh 👲 Default	Apply Export Definition Close					

Important settings needed for testing:

#### Table 12WCDMA settings

Setting	Description
Band	Band under test.
Path Loss	Default values for 3G; 15dBm if Antenna Coupler is used, 7dBm if DUT if directly connected with S-CORE.
DL, UL ARFCN	Downlink / Uplink Absolute Radio Frequency Channel Number
DL Reference Power	Downlink reference power. Lower default values when connecting directly to Device Under Test.
UL Reference Power	Uplink reference power.
MS IP address	IP for mobile, it should be configured in the same subnet as the S-CORE.
DNS IP address	User can configure the S-CORE IP as DNS IP if the system operates in local standalone test environment.
K value, IMSI	Information of test SIM card. Refer to the System Configuration Document.

For detailed information about the settings, please refer to the *Anite S-CORE Application Testing: Operating Guide*. After changing the settings or starting test cases for the first time after logging in to the S-CORE GUI, first click on **Apply** and then **Switch on** the cell.



# 6 VZW IMS REGISTRATION & RETRY MULTICELL TEST CASES

This section is only relevant to customers that wish to test VZW Multicell test cases (e.g. IMS Registration multicell test cases Test cases 2.27\_Test1,2 and 3).

The VZW Multicell test cases require a multicell RF stack package which you download from Keysight Software Manager as described below.

# 6.1 Backup LTE cell settings from single cell RF stack

Before installing the multicell RF stack package, backup the existing LTE cell settings of the single cell RF stack as follows:

- 1. Log in to the S-CORE GUI.
- 2. Right click on LTE Cell and select **Settings of 1**.
- 3. Click **Export** and save the settings to a file which can later be imported.

### 6.2 Installing multicell RF stack package

Install the multicell RF stack package as follows:

- 1. Download the multicell RF stack package as follows:
  - a. In a browser, log in to the Keysight Software Manager, available at <a href="http://www.keysight.com/my">http://www.keysight.com/my</a>.
  - b. Under S-CORE Product, select the Base Application <version>.
  - c. Download the S-CORE RF Package and save it to your PC.
- 2. Ensure that the S-CORE unit is switched on.
- 3. In a browser window, type the following URL:

#### http://10.23.203.xx/litepoint

Where **xx** is the IP address of the S-Core unit.





íQxact	Tech	nnology Admi	in Tool:	s File	Session
	l	System Info Network	License Info Su	upport	
tem Information					
┌─ System Info -					
Product Name	S-CORE	MAC Address	F4:6D:04:06:75:26	Driver Version	78.1.14.130529
Serial Number	IQXS1294	OS Version	11.3.7	GUI SW Version	1.4.1.93698
Hardware Version	2.1.0	Firmware Version	1.5.0	Web Srv Version	1.4.1.87871
Cal. Date	17-JUN-2011	Config Version	062713D0	BIOS Version	0006
Lower Instrume	nt Slot ———	Upper Instrume	nt Slot	Signaling Slot	
Serial Number	MD300532	Serial Number	MD300530	Serial Number	A8000021
Hardware Version	1.1.1	Hardware Version	1.1.1	Hardware Version	1.0.0
Cal. Date	02-JUL-2011	Cal. Date	16-AUG-2011	Cal. Date	n/a
Driver Version	1.0.0.2016	Driver Version	1.0.0.2016	Driver Version	1.0.0.3115
Config Version	032813A4	Config Version	032813A4	Config Version	050813E0
	021513B0		021513B0		

4. Click **Upgrade** to display the Instrument Upgrade screen (below).

Instrument Upgr	ade		
This webpage is used for upgrading softwa	are on the instr	ument.	
Please use the Browse button to locate an	n Installation pa button.	ckage,	
then Click the 'Start Install'			

- Click Browse and select the S-CORE RF Stack Packager executable file downloaded in step 1 (above).
- 6. Click Start Install to install the package.



# 6.3 Configuring S-Core GUI for multicell

After installing RF package, log in to S-CORE GUI. Now two cell options (Cell1 and Cell 2) can be seen in S-Core GUI

<b>2</b>	Anite S-COREIMS Campaign - new [10.23.205.94]						
File Tools Campaign Vi	ile Tools Campaign Views Help						
IP Multimedia Subsystem							
2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	🧏 Testcase	Verdict	🚯 Title				
⋥ Switch Test Plan	VZW-IMS-2.27_Test1 VZW-IMS-2.27_Test1		IMS REGISTRATION BEHA	VIOR ACROSS SYSTEM 1	TRANSITIONS - TEST 1 TRANSITIONS - TEST 1		
💕 Logout	VZW-IMS-2.27_Test3		IMS REGISTRATION BEHA	VIOR ACROSS SYSTEM 1	TRANSITIONS - TEST 3		
L TC Pool							
Editable TC Pool							
PICS Pool							
SCAMP Pool							
MSG Pool							
Cocal Options							
🔧 IMS options	•	1	(		1	Ð	
<b>1</b> Statistics	Delete	Down	L Up	Delete All	Select		
ပ္ Macros		VZ	W-IMS-2.27_Test	1		-	
🝺 TC Logs							
🕦 Launch Tracer							
Automation Server	This test verifies that the UE meets Verizon Wireless requirements for IMS registration behavior across system transitions.						
1 OFF LTE-FDD 2 OFF NONE	Preconditions: UE is designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.						
	Test procedure: Test Procedure Test 1	o # 7,1 #1				•	
	A						

To configure and enable the LTE cells:

1. Right click on the first cell and select Technology > LTE-FDD LTE-FDD (as shown below).

TC Logs	Title: IMS REGISTR/	LTE-FDD GER	AN-RAT	STEM T
🕮 Launch Tracer	Description	LTE-FDD WCD	MA-RAT	
Automation Server	This test verifie	LTE-FDD LTE-	FDD	reless re
	1	GERAN-RAT N	IONE	
2 OFF LTE-FDD	Settings of 1	WCDMA-RAT NONE		ess LTE
	Technology 🔸	LTE-FDD NON	E	
	Test Procedure	Test 1		_
💓 ON 🛛 🔲 OFF	👌 Run Select	ted	💽 Start	

- Right click on the second cell and select Technology > LTE-FDD LTE-FDD.
   Both cells are now configured for LTE
- 3. Right click on the first cell and select **Settings of 1**.



4. Copy the sample Cell 1 settings embedded in this document (below) to a local directory.

Sample\_Settings\_Cell1.settings

- 5. Import the sample file in the S-CORE GUI, and modify the following settings
  - The serial number of the S-Core unit.
  - Uplink and downlink power levels.
  - Path losses

	🛃 Testcase 🛛 😭 Ver	dict		🚯 Ti	tle				
羄 Switch Test Plan	VZW-IMS-2.27_Test1 VZW-IMS-2.27_Test1			IMS F	REGISTRA REGISTRA	TION BEI TION BEI	HAVIOR	ACROSS SYSTEM TRAI ACROSS SYSTEM TRAI	NSITIONS - TEST 1 NSITIONS - TEST 1
💕 Logout	VZW-IMS-2.27_Test3		XX A	nite S-O	OREIMS I	BTS 1 LT	E-FDD o	options [10.23.205.94	.] – 🗆 🗙
L TC Pool				1		_			
Editable TC Pool			Main	PDN1	PDN2	PDN3	PDN4	P-CSCF/DNS Setting	gs SIM & Se · · ·
PICS Pool				Bandwid	th	10 MF	łz		
CAMP Pool			Fre	equency	Band	13			
MSG Pool			UL F	requenc	y (MHz)	782			
Cocal Options			DL F Rx	Power (	y (MHz) (dBm)	751 20			
MS options	4	_	Тх	Power	(dBm)	- 30			
Ctatistica	🔋 Delete 🛛 🔻 Do	wn	Externa	al Attenu	ation (dE	3) 10			
Statistics		=	EP:	5 Attach	туре	EPS C	only		
U Macros				JE Categ	Jory	CAT1			
📂 TC Logs	Title: IMS REGISTRATION BEHAVIOR A	CRO	nef 🔁	resh	🏷 Defau	t 🖉	Apply	💾 Export 📄 Imp	port 🔰 Close
💯 Launch Tracer	Description								Load settings from ile
Automation Server	This test verifies that the UE meets	Veriz	on Wireles	s requirer	ments for l	VIS regist	ration be	havior across system tra	nsitions.
1 OFF LTE-FDD 2 OFF LTE-FDD	Preconditions: UE is designed to operate on the V	'erizoi	n Wireless I	LTE 3GPF	P Band 13	network.			
	Test procedure:								

- 6. When complete, click **Apply**.
- **7.** Repeat steps 3 to 6 for the second cell using the sample Cell 2 settings embedded in this document (below)



Sample\_Settings\_Cell2.settings

Both LTE cells are now configured.

8. Press "ON" to turn on both LTE cells.





# 6.4 Limitations for multicell RF stack

Currently, it is limitation in RF multicell stack that both cells should be turned on together at the same time. For multicell test-cases, it has been mentioned in the specification to turn off the cell 1 and turn it on later in the test case. For this, cell RF power is reduced to very minimum value and will be increased when required in the test case to turn on the cell.

Also, cell settings which are exported using single cell RF stack cannot be imported directly for cell settings in multicell RF stack. They need to be updated manually.

### 6.5 **RF connection for multicell test cases**

Connect both RF output (1A and 1B) from front panel of S-CORE to UE while running Multicell test cases.



LED Indicators USB Ports Power Button

## 6.6 Configuring S-CORE GUI for single cell

If you have installed the Multi-cell RF stack package (as described in 6.2), you can also use the S-CORE in a single cell configuration as described below.

 Depending on the RF technoloy required, on the left-hand menu of the S-CORE GUI, right-click on the cells that are not required, select **Technology** and select the **NONE** option for the RAT as shown below:



2. Repeat for all cells except for the one that is required for testing.



	Voice over	IP			
	R Testcase	Verdict	1 Title		# Group
Switch Test Plan	VZW-IMS-VoIP-2.01	1.00	BASIC VOLTE CAL	L SETUP	VZW IMS VOIP
Logout	VZW-IMS-VoIP-2.02		VOLTE CALL SETU	P WITH RINGBACK TONE FOR	FUTURE USE VZW IMS VOIP
TC Pool					
Editable TC Pool.					
PICS Pool					
CAMP Pool					
MSG Pool					
Local Options					
VoIP options					
Statistics					
Macros					
TC Logs					
Launch Tracer					
Automation Serve	1 Delete	Town	🔺 Up	👔 Delete All	e Select
OFF LTE-FDD OFF NONE			VZW-IMS-Vol	P-2.01	,
	Title: BASIC VOLTE CALL SET	UP			
	Description: Bearer Setup Test Cases				
	Preconditions: VoLTE capable UEs desig	ned to operate on the Veri	zon Wireless LTE network		
	Test procedure:				
	1. Power on the UE	tach to the network using t	ne IMS PDN?		
	<ol> <li>Check: Does the UE at</li> <li>Initiate a voice call from</li> <li>Check: Does the UE tra</li> <li>SS transmits a SIP 200</li> </ol>	n the UE using VoLTE. ansmit a SIP INVITE. ) OK.			

#### For example, to select a single LTE-FDD cell, select NONE for other cells as shown below:

- 3. Apply the changes to the cell before switching it on as follows:
  - a. Right-click on the RF cell and click **Settings**. to display the RF settings dialog.
  - **b.** Click **Apply** to save the changes.
- 4. Start the RF cell manually as described below:
  - a. Right-click on the RF cell and click **Settings**.
  - **b.** Click **Switch On**.

**Note:** VoWiFi test cases start the RF cells automatically.



# 7 RADIO LAYER LOGGING

You can trace the radio layer message exchange related to the test run.

### 7.1 Starting radio layer tracing

To start radio layer tracing, click on the Launch Tracer button on the toolbar.



This will open a separate logging window which traces the lower layer messages.

Status       Option of the status         Previous Text       Option of the status         Option of the status       Option of the status<		→ Anite S-Core LTE/WCD	MA V1.501															- 0 <b>X</b>
Horitanan 0.22.202.21 Clefentane John       Image: Clefentane John </th <th>Lonair</th> <th>ng</th> <th></th> <th>Style 👻 🕢</th>	Lonair	ng																Style 👻 🕢
togging       IIE       v       population       v       megane load	Hostname 10.23 Username admin Password *****	2.203.21 0 n Conr	ect Disconnect	Service Log Service	New CI	lose Save	Open	AutoSave as HTML	Merge Cells Explore Log-folder	Name: T e x t:	s	Search	Previous	Next	List Chart			LA.
Message         Message <t< th=""><th>Logging</th><th></th><th>LTE</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th><b>▼</b> ×</th><th>Properties</th><th># ×</th></t<>	Logging		LTE													<b>▼</b> ×	Properties	# ×
Indic       Id	Filename	Filesize	Time	UE	PB(Id)	Frame	6	Chan		Prim	uitive			Mass	200	-	Message Header	-
	Logging	20		E	LI	РНҮ		L2_MAC	L2_	RLC	L2_PDCP		L3_RRC		NAS		Image: Second	0 0 0 5 50 1668264 11 0 1645 1 8 2 0 3 222

You will be able to view the message exchange in two views, one as simple 'list view' and the other 'sequence chart view' showing message exchange between different layers.

When you select a message, you can view the detailed decoded message contents and the message dump on the right-hand pane.

You can stop the tracing by clicking the **Close** button in the logging window (above).



# 7.2 Enabling automatic RF tracing

It is recommend that user select the automatic start tracer option, so that RF tracing will start automatically with start of test case and RF logs saved with test case logs in same folder.

To enable automatic RF tracing:

- 1. Click on Local Options.
- 2. Display the Ext Tools2 tab.
- 3. Select the Auto-Start Tracer checkbox as shown below.

Switch Test Plan	Q Local Options	8 <mark>X</mark>
Magout 201	Logs   Ext Tools 1   Ext Tools 2   Server   Fonts	
TC Pool	Not all tools below may be needed for this application. (V	/oIP)
Editable TC Pool	Location and name of the image viewer (for *.jpg files)	<b>Q</b>
PICS Pool	C:\Program Files\Internet Explorer\iexplore.exe	
CAMP Pool	Media Player Location and name of the media player (for *.3gp and *.mp4 files)	۹
MSG Pool	C:\Program Files\Media Player Classic\mplayerc.exe	
Local Options	AMR Player	9
VoIP options	C:\Program Files\Windows Media Player\wmplayer.exe	
Statistics	S-CORE Tracer	
Macros	Auto-Start Tracer     Location and name of the S-CORE Tracer	<u> </u>
TC Logs	Automation Server	
	Location and name of the Automation Server	<u> </u>
	C:\Program Files\Anite\S-CORE\AUTOserver.exe	

## 7.3 Dispaying RF logs

Once the test case finishes, you can open the directory containing the RF logs by clicking TC Logs from the S-CORE GUI menu. The following image shows the RF log file in an example results folder.

Name	Date modified	Туре	Size
about_2017-04-03_14.03.06	4/3/2017 2:03 PM	Text Document	3 KB
📓 body	4/3/2017 1:56 PM	JScript Script File	4 KB
🖂 default_verizon	4/3/2017 1:56 PM	Outlook Item	2 KB
default_verizon.pics	4/3/2017 1:56 PM	PICS File	7 KB
epdg_2017-04-03_14.03.01.ikev2	4/3/2017 2:03 PM	IKEV2 File	44 KB
📷 hi_left	4/3/2017 1:56 PM	GIF image	5 KB
🚾 hi_right	4/3/2017 1:56 PM	GIF image	5 KB
IMS_LOG_VZW-VoWiFi-05.15_71710_2017	4/3/2017 2:02 PM	Text Document	34 KB
🔝 left	4/3/2017 1:56 PM	GIF image	6 KB
LTE_VZW-VoWiFi-05.15_2017_04_03_14_0	/3/2017 2:02 PM	Text Document	1,432 KB
	4/3/2017 1:56 PM	GIF image	4 KB
🔝 no_selection	4/3/2017 1:56 PM	GIF image	8 KB
mw_settings_2017-04-03_14.03.06	4/3/2017 2:03 PM	Text Document	1 KB
options_2017-04-03_14.03.06	4/3/2017 2:03 PM	Text Document	2 KB
🔝 right Type: Text Docu	iment l	GIF image	6 KB



You can also view saved RF logs as follows:

- 1. Display the RF Tracer by selecting to the **Logging** tab.
- 2. Click **Open** from the menu, then select the RF log file (displayed in above example: LTE\_VZW-VoWiFi-05.15\_2017\_04\_03\_14\_02\_59).

The log is then displayed in the window as shown below.

0	Anite S-Co	TE/WCDM	02																		
System	Logging Scen	ario Builder Te	est Mar	nager																	Style 👻 🚱
			E		Nan	165			. Ku	Next			View	Auto	DI Revo			M			
	r con sure	as HTM	AL Co	is Log-fe	older							C. I.S. I.	Filter	Refresh	Gric	Gr	rid				
	Lo	gging				-	_	Search			_	Dis	olay			LTE	Analyzer	_			
Logging		System LTE													+ ×	System Ser	ttings		< Capture Filter 10.23.203 a ×	RRC_CONNECT	ION_SET. • >
Filename	Filesize	Time	UE	RB(Id)	Frame	S.,.	Chan	1	Primitive		1		Messar	en .		-			Capture Filter 10.23.203.75	Message Head	er 🔻
-LTE.log	1.466.214	1.605.381	0	(0)	0	3		CPHY CELL SETUP	REO						1	S-C	ORE Sett	ngs *	8 11 7 00 21 2 2 3	80 Q4 💷 ≠	
		3.510.247	0	(0)	0	3		CPHY_CELL_SETUP	RES							Licensin	ig: R&D/0	anfar	Message	B Header	
		3.518.136	0	SI(20)	1	0 8	ICCH	SYSTEM_INFORMAT	ION_BLOCK_TYPE1							Support	t: 2010		HE LTE	TraceType	0xabcd0
		3.587.958	0	51(20)	8	0 E	ICCH	SYSTEM_INFORMAT	ION_BLOCK_TYPE1							Custom	Options:	N.A.	WCDMA	UEId	0
		62.483.184	0	(0)	786	5		PHY_UL_RACH_IND								1				RBID	SRB0(22)
		62.496.491	0	SR80(22)	787	8 L	ILSCH	MAC_DATA_IND								COn LTE	Security	8t In *		MsgTvp	37 (0x25)
		62.496.677	0	5R80(22)	787	8 0	ссн	RRC_CONNECTION	REQ							AME	00.0	0.00		MsaPrim	197 (RRC
		62,498,690	0	SRB0(22)	788	0 0	CCH	RRC_CONNECTION	SETUP							OP	00.0	0.00		TraceMs	7
		62.320.1/0		SRB1(23)	791	0 0	VCCH VCCH	PRC_CONNECTION	SETUD COMPLETE							AKA Mile	na On			SenderT	15/13 R
		62,528,997	0	SR81(23)	791	1 6	CH	MAC DATA REO	Control Control and the							K	00.0	0.00		TxTimeS	6249869
								And a second							*	RAND	00.0	0.00		TyFrame	788
		UE		1.1	_РНҮ		LZ_MA	C L2_RI	LC 1.2_PD0	CP.	L3_1	IRC		NAS		NAS Inter	grit. Nor	0		TyCubCr	0
		* 0/3					CP	HV_CELL_SETUP_REQ							H	BBC Inter	anit Nor	8		Receiver	9/12/09
						CPH	CELLISET	TUP_RES	-							RRC Enc	odi. Nor	e		MeeCha	CCCH (20)
		# 1/0						-	SYSTEM_INFORMATION	N_BLOCK_TYP	PEI				_	Consider	En On			MisgCrid	7
		= =/D	BMY 11	NOV IND				-	STSTEM_INFORMATION	CBLOCK_119	re1									DuGub Fr	0
		# 786/3		MAC	DATA IND															RXSUDFT	0
		-10/10	_				-	RRC_CONNECT	TION_REQ							1				= Attachmen	at
		#768/0					_		RRC_CONNECTIO	DN_SETUP						Set LTE	Security /	Integrit		Total Size	22 Bytes
		+ 791/0		MAC_I	DATA_IND		111									Refresh	LTE Secur	ty / Int		E Conten	A
								RRC_CO	NECTION_SETUP_COMPLE	TE						1				BINA	22 Bytes
		#791/1			MAC	DATA_RE	EQ.									Intial IE	IP Paran	eters *	1		1
		= 791 / 3								NA	S_ATTAC	LAEQUEST				HIDAIOC		0.20	< III +		
		Output																			a 7
T System		CopyFile: The	operat	ion comple	ted succe	sfully	2														
Logging		**** command 0000 00 00 02	\$1: mag	gid:131075 00 07 D1	MIV_CTRL	auto_c	LOSE ID:0	MIV:2001 Length:0.													
Scenario	Builder	AUTO Socket Is Clos Idle.	CLOSE																		1
Boo Test Man	ager	Listening for	Cilents	s. (port 2	00031																
	ŝ	4 Log	Scenar	rio Activity	Server	Activity															
		20 - 20 - 20	_		1.0	_	-														

# 7.4 Collecting Service Logs

Service logs are used by Customer Support for analysis when you experience RF issues during test cases.

At the end of any test cases where you experience RF issues:

1. Click on the System tab, then click Service Log from the menu.



2. Save the log to a local directory and send the service logs to Customer Support.



# APP A APPENDIX

# A1 S-CORE Monitor GUI

The following GUI is displayed on the monitor connected with the S-CORE. Using the monitor is optional. It is required only when troubleshooting is needed.

			onitor			
					- Unper Slot (B)	
					HW Modules:	VSA 400MHz - 3000MHz VSA 400MHz - 3000MHz
					Serial Number:	MD300576
					HW Version:	1.1.4
					Calibration Date:	03-AUG-2012
					Configuration Vers:	092911A0/070210B0
					ver Slot (A)	
					HW Modules:	VSA 400MHz - 3000MHz VSA 400MHz - 3000MHz
					Serial Number:	MD300546
					HW Version:	1.1.4
					Calibration Date:	03-AUG-2012
					Configuration Vers:	092911A0/070210B0
Desideration	8 00DF					
Product Name:	S-CORE	OS Versior	n:	OS:11.3.6	HW Version:	1.0.1
Product Name: Serial Number:	S-CORE IQXS1936	OS Versior Firmware V	n: /ersion:	OS:11.3.6 0.9.8.67131	HW Version: Calibration Date:	1.0.1 09-AUG-2012
Product Name: Serial Number: Temperatures:	S-CORE IQXS1936 Normal	OS Versior Firmware ∨ System Sta	n: /ersion: atus:	OS:11.3.6 0.9.8.67131 Firmware Running.	HW Version: Calibration Date: Configuration Vers:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618)
Product Name: Serial Number: Temperatures: IP Address	S-CORE IQXS1936 Normal	OS Versior Firmware V System Ste	n: /ersion: atus:	OS:11.3.6 0.9.8.67131 Firmware Running.	HW Version: Calibration Date: Configuration Vers: Back Slot (C)	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618)
Product Name: Serial Number: Temperatures: IP Address Host Name:	S-CORE IOXS1936 Normal	OS Versior Firmware V System Sta	n: /ersion: atus:	OS:11.3.6 0.9.8.67131 Firmware Running. efresh Status	HW Version: Calibration Date: Configuration Vers: Back Slot (C) HW Modules:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618) Signaling Module
Product Name: Serial Number: Temperatures: IP Address Host Name:	S-CORE IOXS1936 Normal	OS Version Firmware V System Sta	n: /ersion: atus:	OS:11.3.6 0.9.8.67131 Firmware Running. efresh Status Sys Stats	HW Version: Calibration Date: Configuration Vers: Back Slot (C) HW Modules: Serial Number:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618) Signaling Module MD400201
Product Name: Serial Number: Temperatures: IP Address Host Name: C Use Static IP/	S-CORE IOXS1936 Normal IOXS1936 Address:	OS Versior Firmware V System Ste	n: /ersion: atus:   ico	OS:11.3.6 0.9.6.67131 Firmware Running. efresh Status Sys Stats m_script_client	HW Version: Calibration Date: Configuration Vers; Back Slot (C) HW Modules: Serial Number: HW Version:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618) Signaling Module MD400201 1.0.0
Product Name: Serial Number: Temperatures: IP Address Host Name: C Use Static IP/ IP Address:	S-CORE IQXS1936 Normal IQXS1936 Address: 10.23.203.36	OS Versior Firmware V System Sta	n: /ersion: atus:   	OS:11.3.6 0.9.6.67131 Firmware Running. efresh Status Sys Stats m_script_client	HW Version: Calibration Date: Configuration Vers: Back Slot (C) HW Modules: Serial Number: HW Version: Calibration Date:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618) Signaling Module MD400201 1.0.0 n/a
Product Name: Serial Number: Temperatures: IP Address Host Name: C Use Static IP/ IP Address: Subnet Mask:	S-CORE IQXS1936 Normal IQXS1936 Address: 10.23.203.36 255.255.248.0	OS Versior Firmware V System Ste	n: /ersion: atus:    Ses	OS:11.3.6 0.9.8.67131 Firmware Running. efresh Status Sys Stats m_script_client	HW Version: Calibration Date: Configuration Vers: Back Slot (C) HW Modules: Serial Number: HW Version: Calibration Date: Configuration:	1.0.1 09-AUG-2012 050212D0 (78.1.11 120618) Signaling Module MD400201 1.0.0 n/a 101812E0 / IP Addr: 10.23.204.36



# A2 Changing TP-Link Router IP Address

To change the TP-Link router IP address:

1. Load a browser and type in **10.23.201.100** into the address bar.

The browser prompts you to enter a username and password.

- 2. Specify the default username and password:
  - Username: root
  - Password: root
- 3. Once logged in, click on the Network tab, then the DHCP and DNS sub-tab from the menu.
- 4. Scroll down and click on **Static Leases**.
- 5. Modify each of the listed IP Addresses as required.

#### Here is a configuration example:

1976   OpenWrt Attitude Adjustment 12.09   Load: 0.04 0.	12 0.12   Auto Refresh: on					
Status System Network Logout						
Interfaces Wifi Switch DHCP and DNS Hostname	s Static Routes Firewall Diagnostics					
DHCP and DNS						
Dnsmasq is a combined DHCP-Server and DNS-Forwarder for	r NAT firewalls					
Server Settings						
General Settings Resolv and Hosts Files TFTP Setting	Advanced Settings					
Domain required	🗹 🎯 Don't forw	and DNS-Requests without DNS-Name				
Authoritative	🗹 🎯 This is the	only DHCP in the local network				
Local server	/lan/ Local domain	/lan/  lan/  Local domain specification. Names matching this domain are never forwared and resolved from DHCP or hosts files only				
Local domain	lan 🕥 Local domain :	lan ② Local domain suffix appended to DHCP names and hosts file entries				
Log queries	🔲 🥥 Write rece	ved DNS requests to syslog				
DNS forwardings	/example.org/10	/example.org/10.1.2.3				
Rebind protection	🗹 🎯 Discard up	🗹 🥥 Discard upstream RFC1918 responses				
Allow localhost	🗹 💿 Allow upstr	🗹 🇐 Allow upstream responses in the 127.0.0.0/8 range, e.g. for RBL services				
Domain whitelist	ihost.netflix.com	s to allow RFC1918 responses for				
Active DHCP Leases						
Hostname	IPv4-Address	MAC-Address	Leasetime remaining			
AppServer1976	10.23.205.76	00:50:56:00:07:b8	8d 7h 56m 33s			
SignallingCard1976	10.23.204.76	6 00:04:a3:42:e7:eb 8d 7h 54m 6s				
IQXS1976	10.23.203.76	f4:6d:04:42:b2:03	8d 7h 53m 20s			

#### Example shown below (should be preconfigured

MAC Address	Reserved IP Address	Remark
F4-6D-04-42-B2-03	10.23.203.76	IP of S-CORE
00-04-A3-42-E7-EB	10.23.204.76	IP of Signalling Card
00-50-56-00-07-B8	10.23.205.76	IP of Application Server

**Note:** The above details are listed in this manual as guidelines. The MAC Addresses and IP Addresses vary according to the system being delivered.



# APP B GLOSSARY

- ARFCN Absolute Radio Frequency Channel Number
- **DHCP** Dynamic Host Configuration Protocol
- **DL** Downlink
- **DNS** Domain Name System
- **DUT** Device Under Test
- **EPS** Evolved Packet System
- **FDD** Frequency Division Duplexing
- GERAN GSM EDGE Radio Access Network
- **GPRS** General Packet Radio Service
- $\ensuremath{\textbf{GSM}}$  Global System for Mobile Communications
- GUI Graphical User Interface
- I/O Input / Output
- **IMSI** International Mobile Subscriber Identity
- **IP** Internet Protocol
- LAN Local Area Network
- **LED** Light Emitting Diode
- **LTE** Long Term Evolution
- MAC Media Access Control
- MCC Mobile Country Code
- **MNC** Mobile Network Code
- **MS** Mobile Station
- **P-CSCF** Proxy-Call Session Control Function
- PC Personal Computer
- RAND Random
- RAT Radio Access Technology
- **RF** Radio Frequency
- **Rx** Expected Receive
- **Tx** Transmit
- **UL** Uplink
- **USB** Universal Serial Bus
- VGA Video Graphics Array
- WCDMA Wideband Code Division Multiple Access

