8100 Mobile Device Test System

Data Throughput - LTE

User Manual

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This manual applies to Data Throughput-LTE Test Packs Version 1.5 or higher.

Page Part Number: 71-006377, Version A4

Table of Contents

1. Introduction

1.1. Overview

This document provides information on the LTE Data Throughput Test Packs. You will become familiar with the Test Pack Suites, Test Cases, and setting up LTE testing scenarios in the *Test Manager* environment by following the step-by-step procedures and test reference documentation.

1.2. Intended Audience

This manual is intended for those who have a working knowledge of wireless communication equipment, and are familiar with the automated testing of mobile devices. It is assumed that the audience is familiar with the *Test Manager* GUI environment. Those who are unfamiliar with the Test Manager should refer to the *Test Manager User Manual* before proceeding further.

1.3. Before You Get Started

Before getting started with this guide, install all software and power up the test system. The controller PC is shipped with the *Test Manager Test Executive* software and *LTE - Data Throughput* Test Packs installed.

1.4. Security Information

The LTE – Data Throughput Test Packs are shipped with the appropriate dongle and software/hardware security passwords configured.

To verify the security information:

1. Open Test Manager and select **Help›About**.
   The *About Test Manager* window displays, as shown in Figure 1-1.

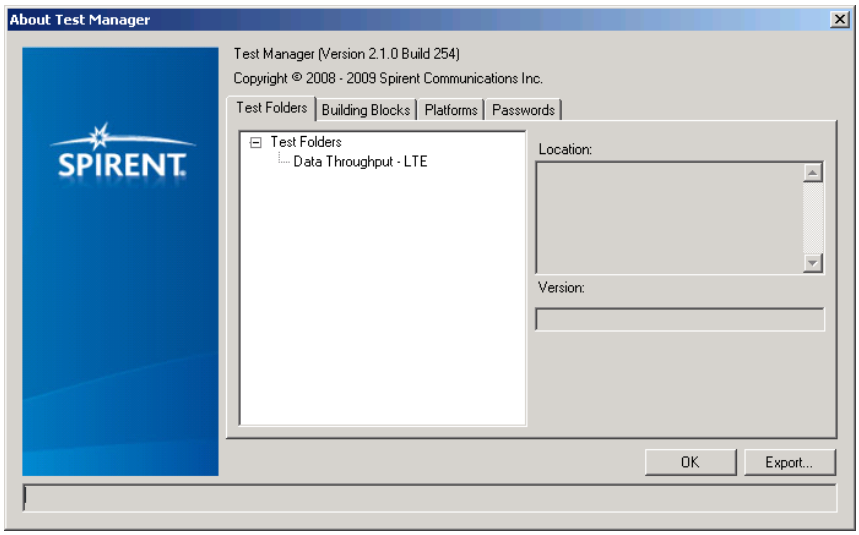

Figure 1-1: About Test Manager Window

2. Select the **Passwords** tab.

3. Under **Installed Features**, confirm the LTE – Data Throughput Test Packs are installed, as shown in Figure 1-2.

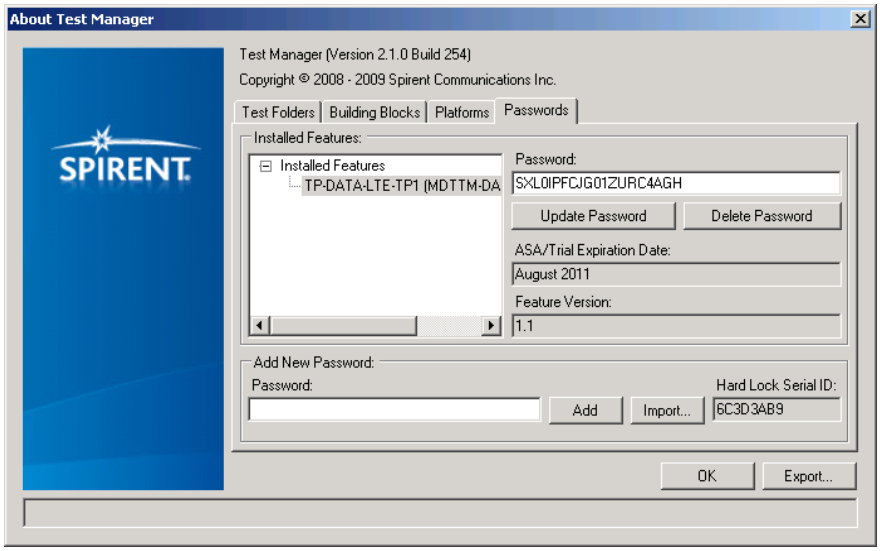

Figure 1-2: About Test Manager Window – Installed Features

Password authentication is a pre-requisite to running any tests supported by these Test Packs. This password is tied to security information provided by the USB hard-lock dongle that comes with the module installation.

For an SVLTE test, confirm the *SVLTE – Data Throughput Test Pack* is installed, as shown in Figure 1-3.

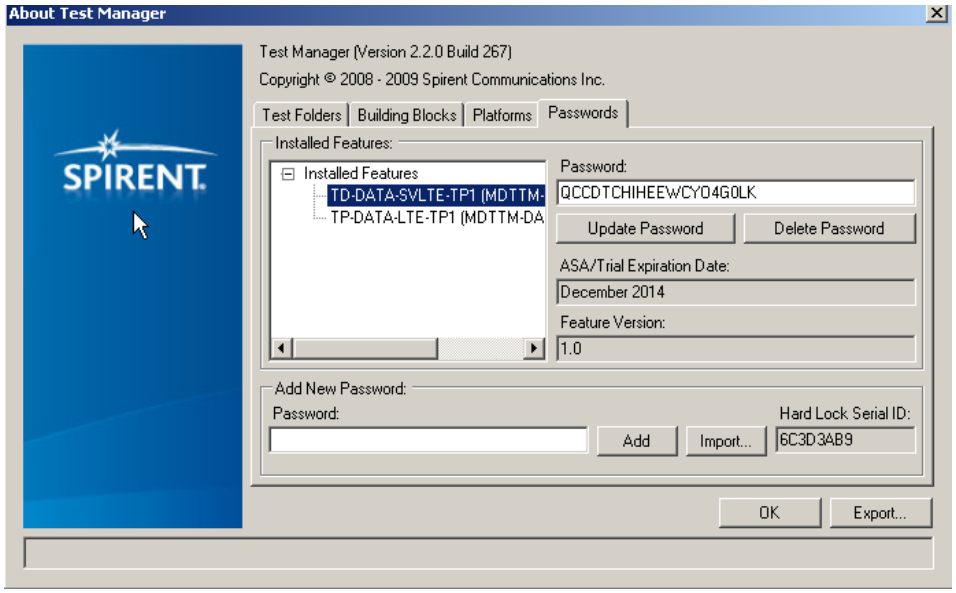

Figure 1-3: About Test Manager Window — SVLTE

If Advanced Channel Models is enabled using SR5500M, confirm the *Data Throughput Test Pack 2* is installed, as shown in Figure 1-4.

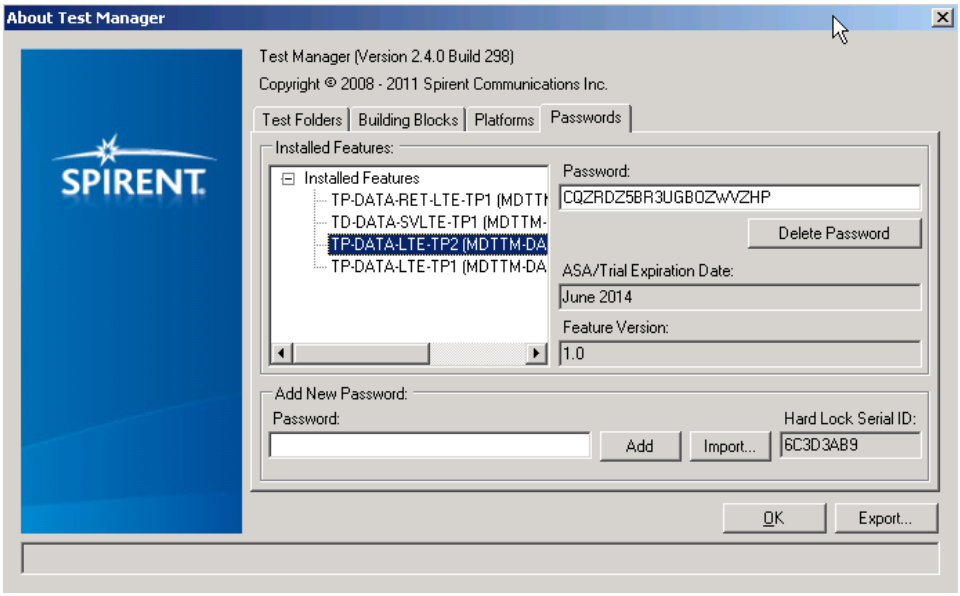

Figure 1-4: About Test Manager Window – Test Pack 2

NOTE: To use the SR5500 for the Advanced Channel Models test, the following minimum options must be purchased:

- **AWGN**
- **Complex Correlation**
- **MIMO**
- **GCM**

For the Variable Reference Channel feature, confirm the Data Throughput Test Pack 3 is installed and authorized with the corresponding password, as shown in Figure 1-5.

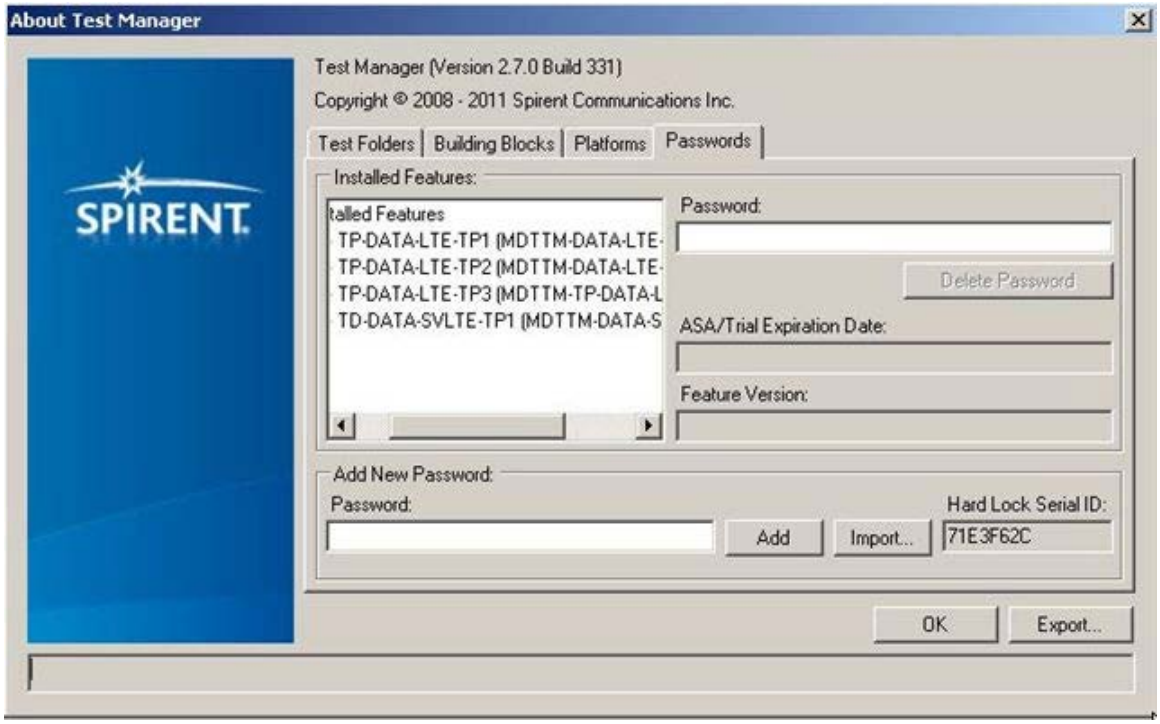

Figure 1-5: About Test Manager Window – Test Pack 3

If you have any questions or concerns, contact Spirent Technical Support at support.spirent.com, or by phone at 1-800-SPIRENT.

1.5. Accessing Documentation

There are two ways to access this document from the Controller PC:

1. Windows Explorer
2. Test Manager

1.5.1. Accessing Documentation from Windows Explorer

Access this Manual offline by navigating to **C:\Program Files\Spirent Communications\Test Manager\Modules\Data Throughput - LTE\User Manual.pdf"** using Windows Explorer, as shown in Figure 1-6.

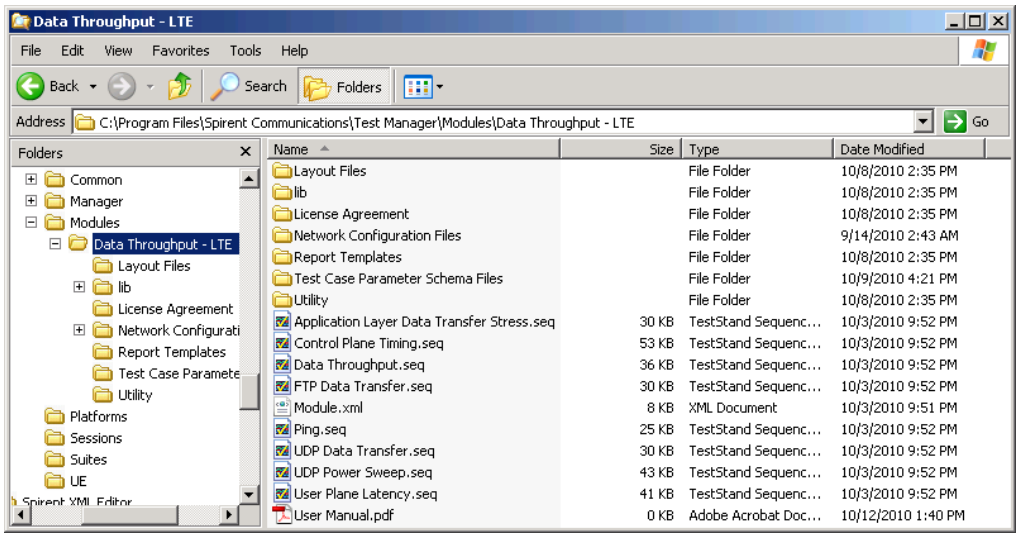

Figure 1-6: Accessing the Manual from Windows Explorer

1.5.2. Accessing Documentation from Test Manager

Access this Manual from the Test Manager menu by selecting:
Help›Modules›Data Throughput - LTE›User Manual.pdf, as shown in Figure 1-7.

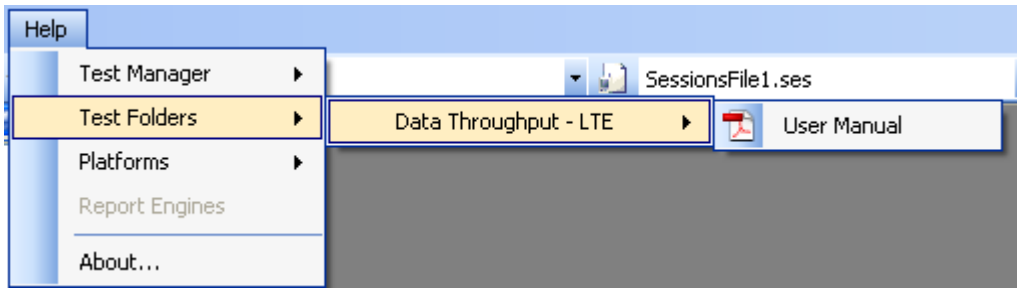

Figure 1-7: Accessing the Manual from Test Manager

2. Data Throughput – LTE Description

2.1. Overview

This chapter provides a high-level overview of the key software and hardware components necessary to configure and use the Data Throughput – LTE Test Packs.

2.2. Description

The Data Throughput - LTE Module is an integrated software component that allows you to perform interactive and automated testing of mobility scenarios on a UE device. Support is provided for:

- LTE Bands: 1, 2, 3, 4, 5, 7, 10, 12, 13, 14, 17, 20, 24, 25, and 26.
- LTE Bandwidth: 1.4, 3, 5, 10, 15, and 20.

NOTE: 1.4M, 3M, 15M and 20MHz bandwidths and Band Classes 1, 2, 3, 5, 12, 20, 24, 25, and 26 have not been fully validated.

The Data Throughput - LTE module test cases run with the Test Manager software. This provides an easy way to automate test sessions with analysis and reporting capabilities.

3. Using the Data Throughput – LTE Test Packs

3.1. Overview

This chapter gives information on using Data Throughput – LTE from *Test Manager*.

This includes the following steps:

1. Configuring the Platform Parameters
2. Configuring the UE Parameters
3. Configuring the Session Parameters
4. Selecting the Parameter Files for Session Execution
5. Locating the Test Cases
6. Creating a Custom Test Suite
7. Configuring Test Case parameters
8. Running a Test Suite
9. Setting up a New UE with the Data Client

3.2. Configuring the Platform Parameters

3.2.1. Supported Platforms

The Data Throughput – LTE Test Packs support the following platforms:

- 8100-B Series

3.2.2. 8100-B Series Platform Parameters

The parameters for the 8100-B Series platform configure the technologies present in the system, as shown in Figure 3-1. Set the *SR3452 Enabled* parameter to **True** to support CDMA/EV-DO. Set the *SR3420 Enabled* parameter to **True** to support WCDMA/GSM. Set the *E2010S Enabled* parameter to **True** to support LTE.

NOTE: The platform parameters will be correctly configured when the system is delivered. It should not be necessary to modify them.

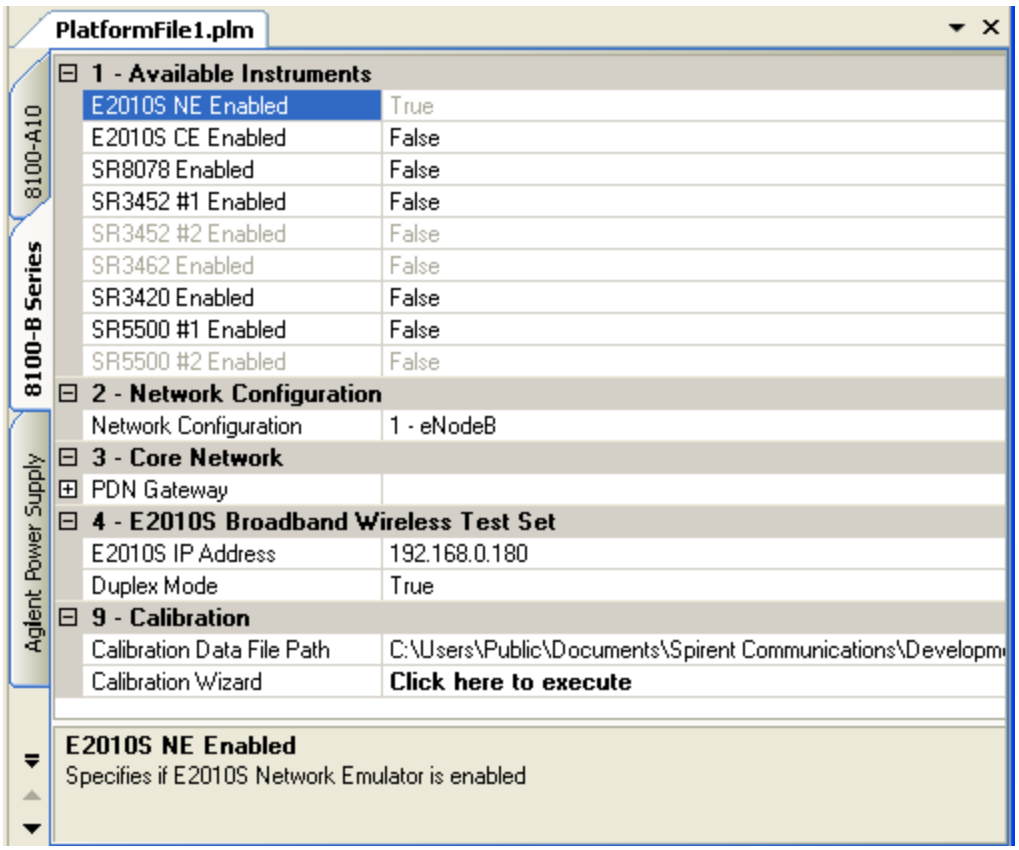

Figure 3-1: 8100-B Series Platform Parameters

For SVLTE, set the parameters as shown in Figure 3-2. To support SVLTE, set the SR8078 and SR3452 #1 to **True** if the configuration is 1eNodeB and 1BSC.

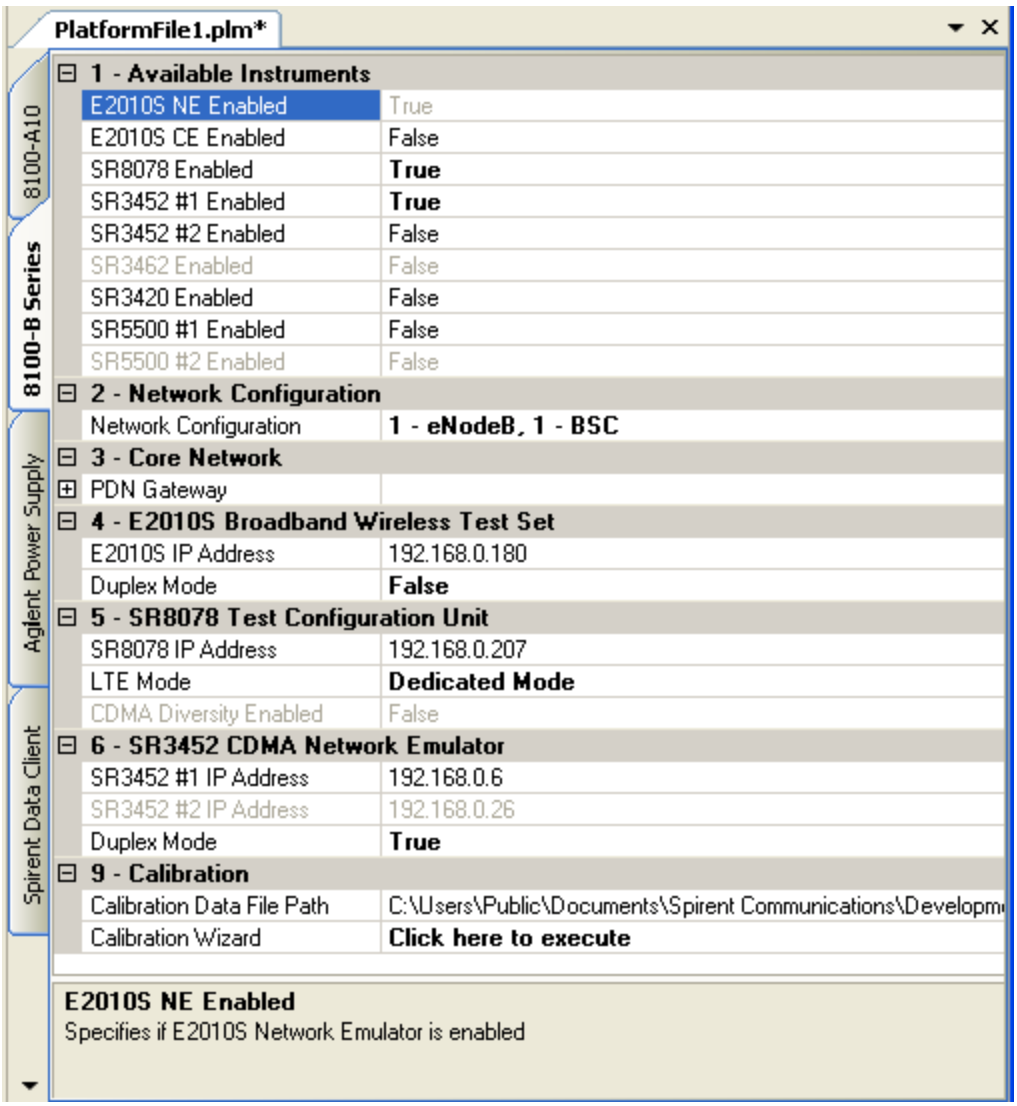

Figure 3-2 :8100-B Series Platform Parameters for SVLTE

For Advanced/Dynamic Channel Models using SR5500M, set the E2010S CE Enabled and SR5500 #1 Enabled to **True**, as shown in Figure 3-3.

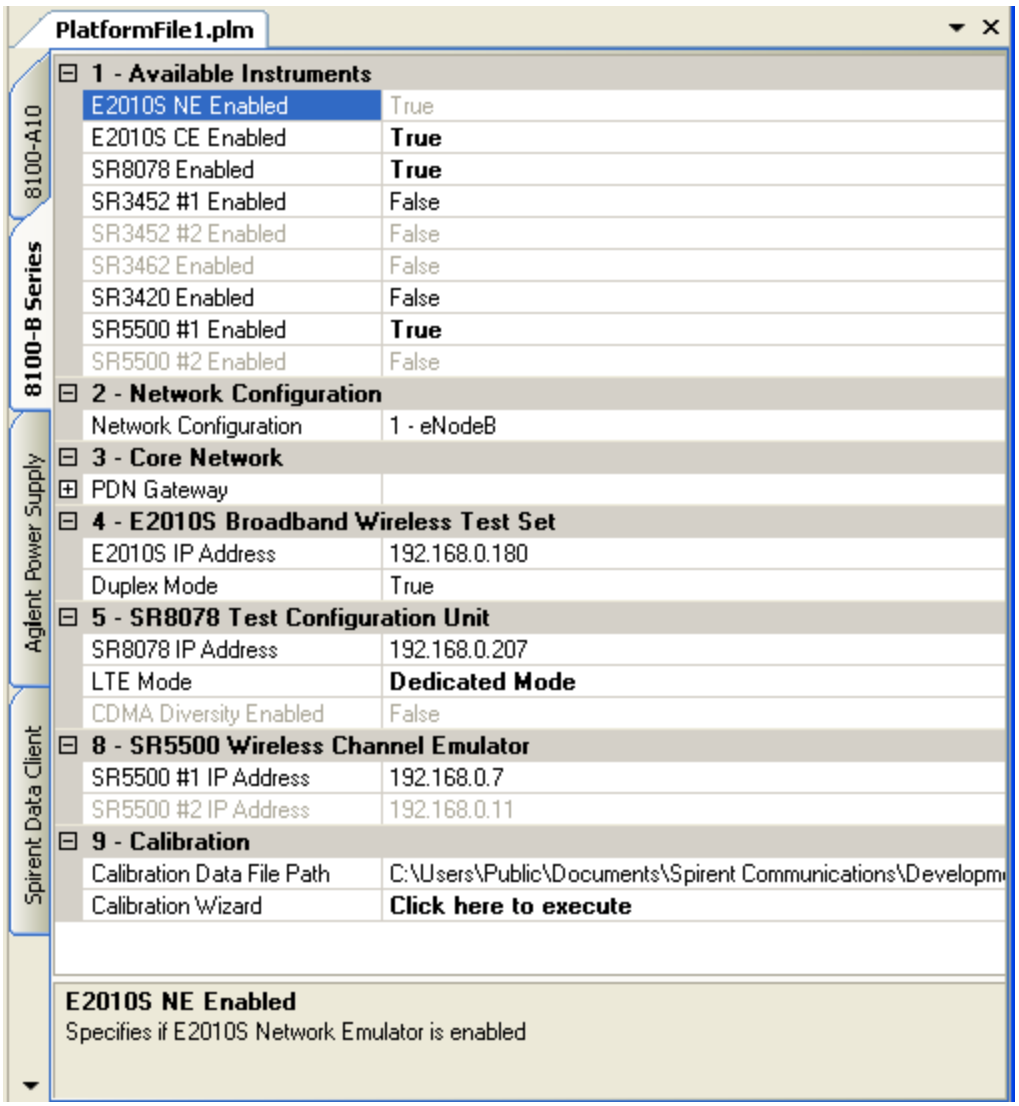

Figure 3-3: 8100-B Series Platform Parameters for Advanced/Dynamic Channel Models

NOTE: If SR5500M Enabled is set to True, test cases can be run with Advanced/Dynamic Channel Models enabled or disabled without having to change any cables.
If SR5500M is set to False, Advanced/Dynamic Channel Model test cases are not supported.

3.3. Configuring the UE Parameters

The level of automation and reliability of the system is heavily dependent on the ability of the system to control the UE. UE parameters are configured to facilitate these activities.

3.3.1. UE Interface Parameters

The UE interface parameters specify how the UE is controlled during test case execution. The options for the *UE Control Method* are:

- **Manual**: The system prompts the operator to perform actions on the UE.
- **AT**: The system issues the specified AT commands to control the UE.
- **Custom**: (Advanced) Allows custom UE control. If **Custom** is selected, the UE Control Sequence File parameter specifies the Control Sequence file used by the system.

The ability of the system to return the UE to a known state before execution of a test case is important. If the UE supports a reliable reset command, set the *Reset for Ensure Idle* parameter to **True**.

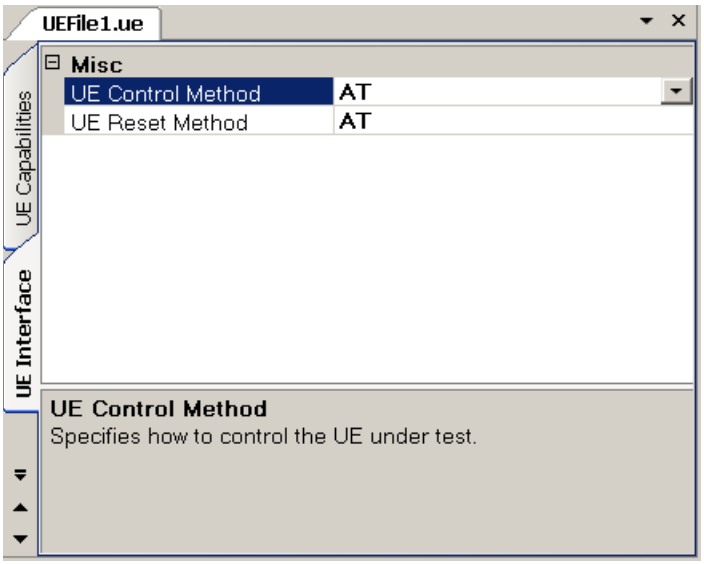

Figure 3-4: UE Parameters Window – UE Interface Parameters

NOTE: In cases where the UE Control Method is set to anything other than Manual, the Manual method will be attempted as a fallback if a command fails or is not provided.

3.3.2. UE Manual Interface Parameters

If the UE Control Method parameter under the UE Interface tab is set to “Manual”, if a command fails, or is not provided by the selected UE Control Method, the parameters of the UE Manual Interface are used. In this case, a window displays prompting you to perform the necessary action on the UE.

- **Timeout Parameters**: Specifies how long the system waits before automatically selecting the defined Timeout Button. The timeout value is selected from a drop-down box providing a range from "Disabled" to "Indefinite." A value of "Disabled" indicates no user prompt will be displayed and testing will proceed as if the UE control was completed successfully. A value of “Indefinite” indicates the function will wait indefinitely. Note that even if Manual control is not selected, it may be used in case of failure. If the timeout value is set to “Indefinite”, the system will wait indefinitely, which may not be desirable.
- **Timeout Button Parameters**: If a timeout other than "Disabled" or "Indefinite" is specified, these parameters specify if the OK or Cancel button is selected when the timeout expires.

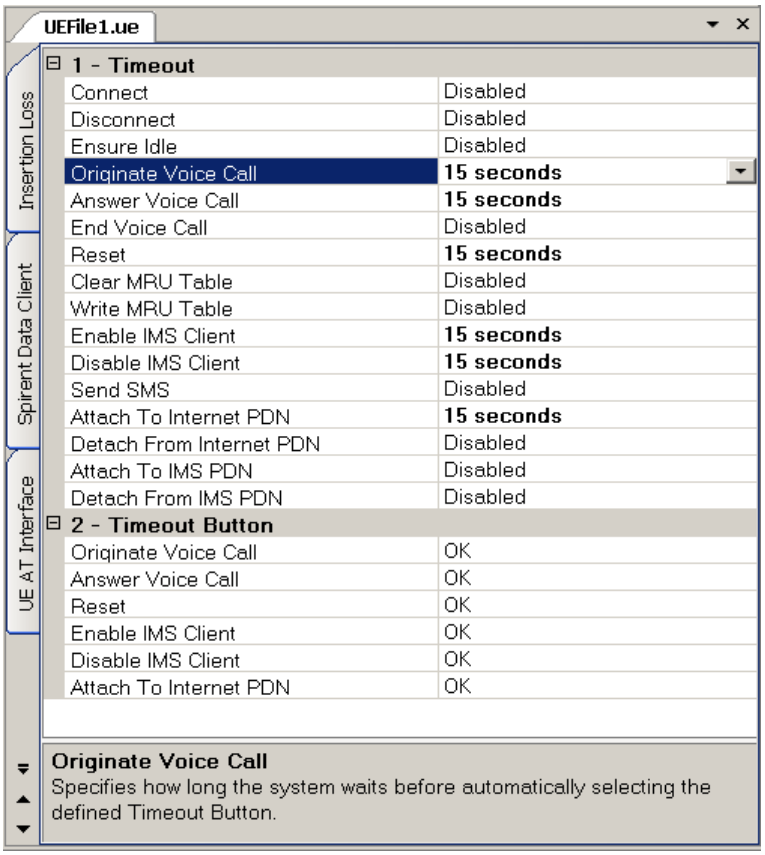

Figure 3-5: UE Parameters Window – UE Manual Interface Parameters

Configuring these parameters correctly can be effective in allowing some level of automation; even if AT commands are not available or supported for the UE under Test.

For example, if the UE can be configured to auto-answer an incoming call, you can set the timeout for *Answer Voice Call*. This allows the UE time to auto-answer the call, and the **Timeout Button** for *Answer Voice Call* can be set to **OK**. This configuration allows the device to reliably answer network-initiated voice calls.

3.3.3. UE AT Interface Parameters

If the UE reliably supports AT commands, AT control can be very useful. The UE is connected to the Data Client PC for AT control after the manufacturer's driver software is installed.

The following parameters are provided:

- **Client IP Address:** Set this parameter to the IP address of the Data Client PC. NOTE: The default address 192.168.0.61 should not be changed.
- **Primary COM Port Settings/Secondary COM Port Settings**: These parameters configure the standard serial port parameters.
  Two COM ports can be used for different commands. For example, if two UE are used to test SVLTE, one COM port for LTE UE and another for 1xRTT UE.

NOTE: The Data Throughput– LTE; Test Packs only make use of the Primary COM Port. The Data Throughput – SVLTE; Test Packs make use of two COM Ports.

  - **Port** – Set this parameter to the port on the Data Client PC assigned to the modem when the UE is connected.
  - **Bits Per Second** – Configure the baud rate.
  - **Data Bits** – Configure the number of data bits.
  - **Parity** – Configure the parity.
  - **Stop Bits** – Configure the stop bits.
  - **Flow Control** – Configure the flow control.
  - **Enable DTR** – Enables Data Terminal Ready Signaling.
  - **Enable RTS** – Enables Request To Send Signaling.
  - **New Line** – Specifies the new line terminator to use.
- **Commands** – Configure the available AT command strings.
- **Test AT Commands** – Use this wizard to test AT commands to check if the UE responds correctly and reliably before testing.

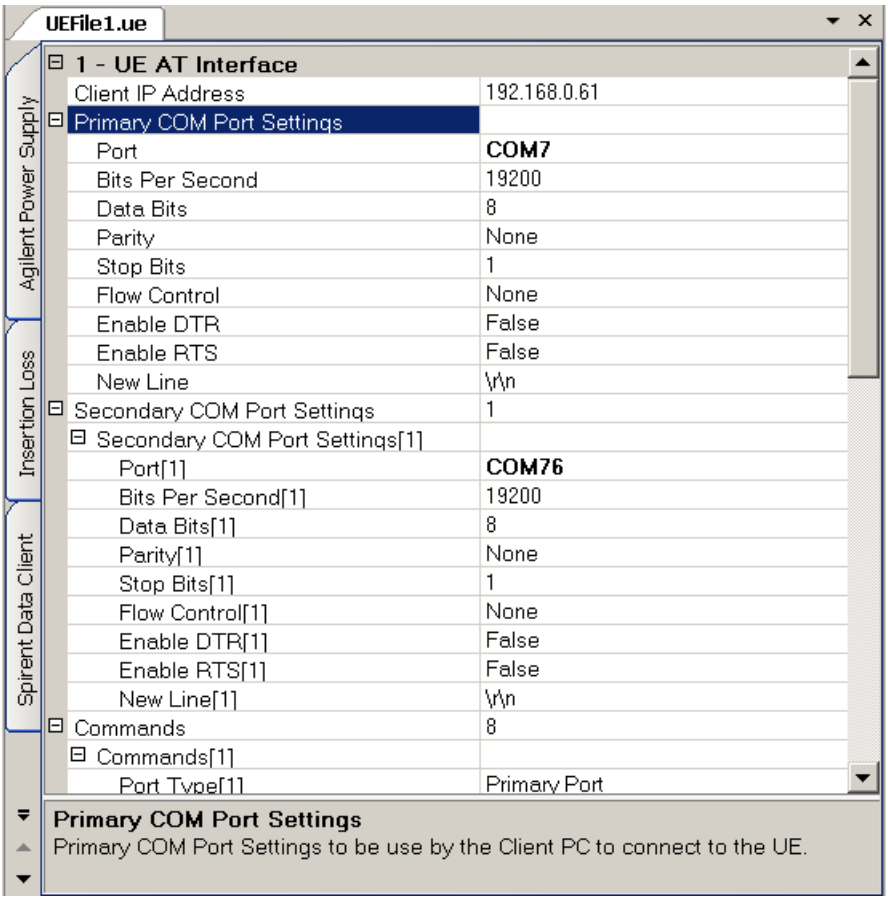

Figure 3-6: UE Parameters Window — UE AT Interface Port Parameters

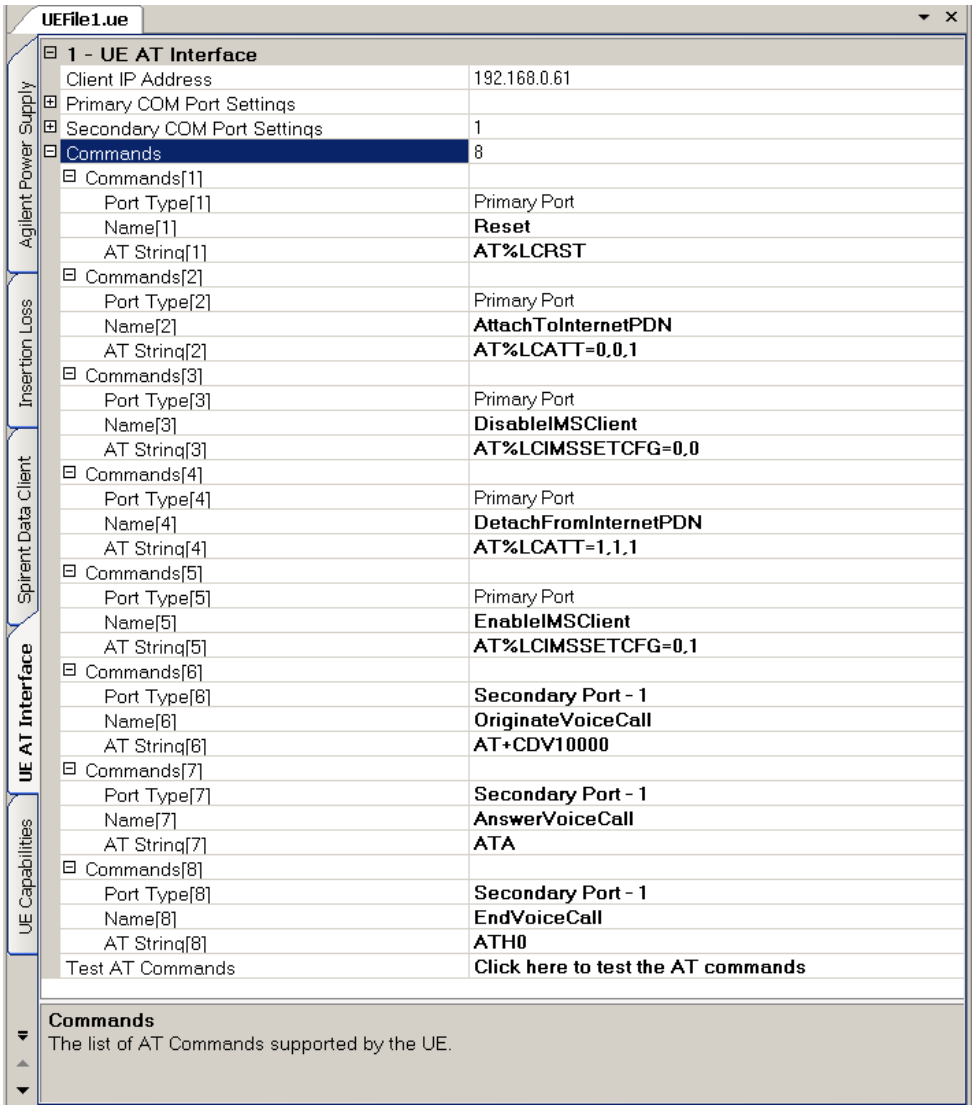

Figure 3-7: Parameters Window – UE AT Interface AT Command Parameters

NOTE: There is great variability in the AT commands supported by UE vendors and how reliably they work. Experimentation may be necessary to determine the best settings.

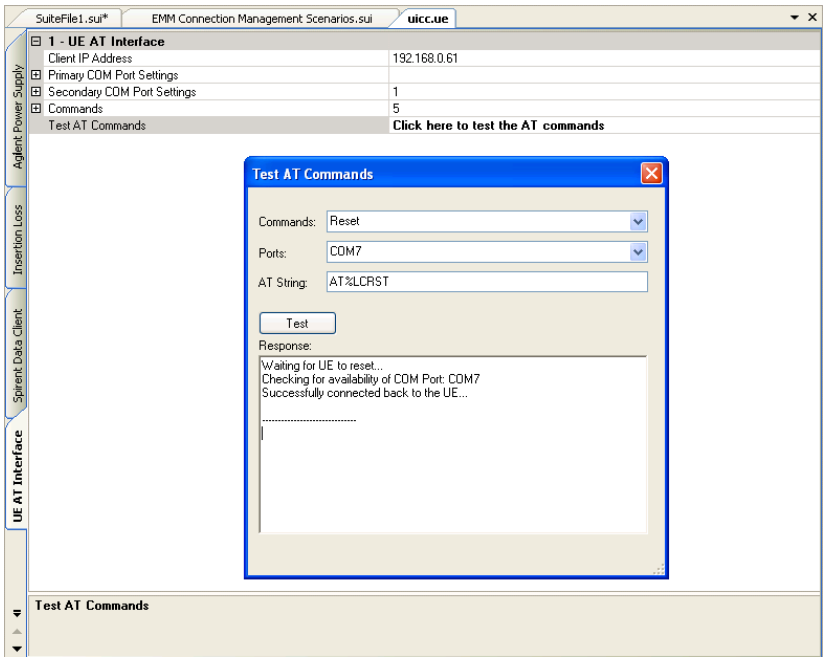

Figure 3-8: UE Parameters Window – Test UE AT Commands

3.3.4. Spirent Data Client Parameters

The *Spirent Data Client Parameters* tab, shown in Figure 3-9, allows you to configure some UE parameters relative to the Spirent Data Client.

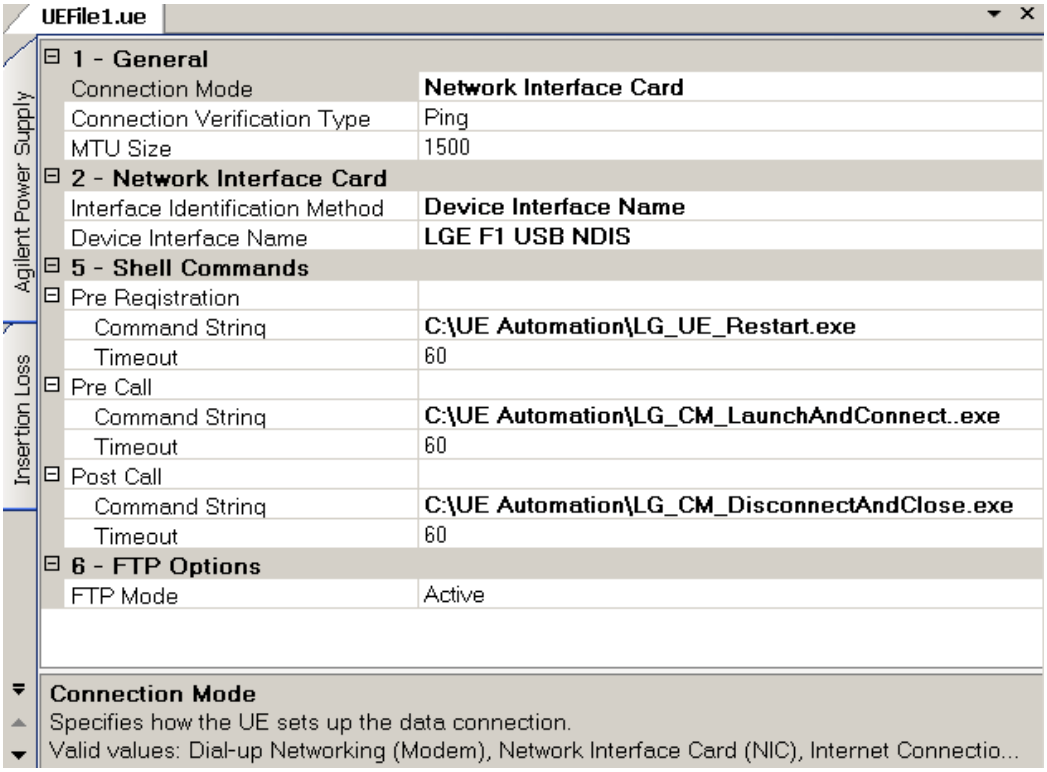

Figure 3-9: UE Parameters Window -— Spirent Data Client

The following parameters are provided:

- **Connection Mode**: Specifies how the UE sets up the data connection. There are currently four modes supported: Dial-up Networking, Network Interface Card, Internet Connection Sharing, and Wi-Fi.
- **Connection Verification Type**: Specifies how to verify the establishment of the connection when the connection mode is Network Interface Card, Internet Connection Sharing, and Wi-Fi.
- **MTU Size**: Specifies the MTU Size of the UE under test in bytes.
- **Interface Identification Method**: Specifies the method the Spirent Data Client uses to identify the UE Network Interface on the Client Laptop.
- **Device Interface Name**: Specifies the device interface name in the route table. This name can be obtained by typing "route print" in the Command Prompt on the Client Laptop when the UE is connected.

NOTE: The Device Interface Name has to be exactly the same as indicated on the client laptop, including any spaces.

- **Shell Commands**: Specifies certain shell commands if an AT command is not used. These shell commands can be executed on the Client Laptop before registration, before setting up data call and after ending a data call. If the shell command is empty, nothing will be executed.
- **FTP Options**: Specifies how the Spirent Data Client initiates the FTP data connection.

3.3.5. UE Capability Parameters

UE Capability parameters configure the security and authentication settings for the UE as shown in Figure 3-10. These parameters also include configuring the PDN number and properties, as shown in Figure 3-11.

The following parameters are provided for security and authentication settings:

- **AS Security**: AS Security settings
- **NAS Security**: NAS Security settings
- **NAS Authentication**: NAS Authentication settings
- **HSS Settings**: HSS Settings

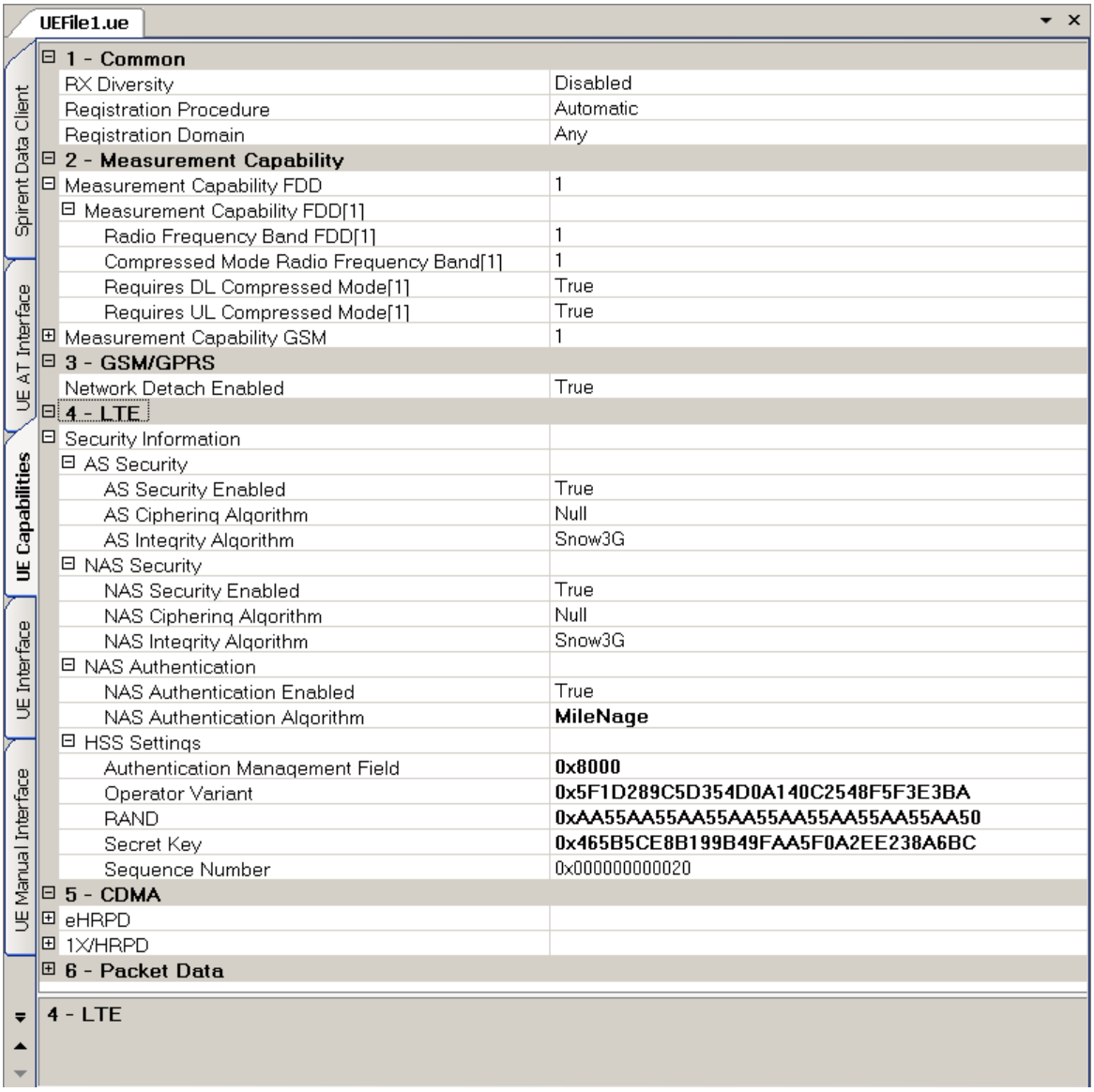

Figure 3-10: UE Parameters Window –Security and Authentication Parameters

The following parameters are provided for configuring PDN number and PDN properties:

- **PDNs**: Parameters for supported PDNs.
- **PDN [N]**: Specifies valid PDN settings.
- **IP Address Type**: Specifies the type of IP address the UE will request. Valid Values: IPv4, IPv6, IPv4v6.
- **APN**: Specifies the Access Point Name (APN) the UE will communicate with.
- **Services**: Parameters for mapping services to PDNs.
- **Service [N]**: Parameters for mapping the service to the PDN.
- **Service**: Specifies the service. Valid Values: Administrative, Application, IMS, and Internet.
- **PDN**: Specifies the PDN that carries this service.

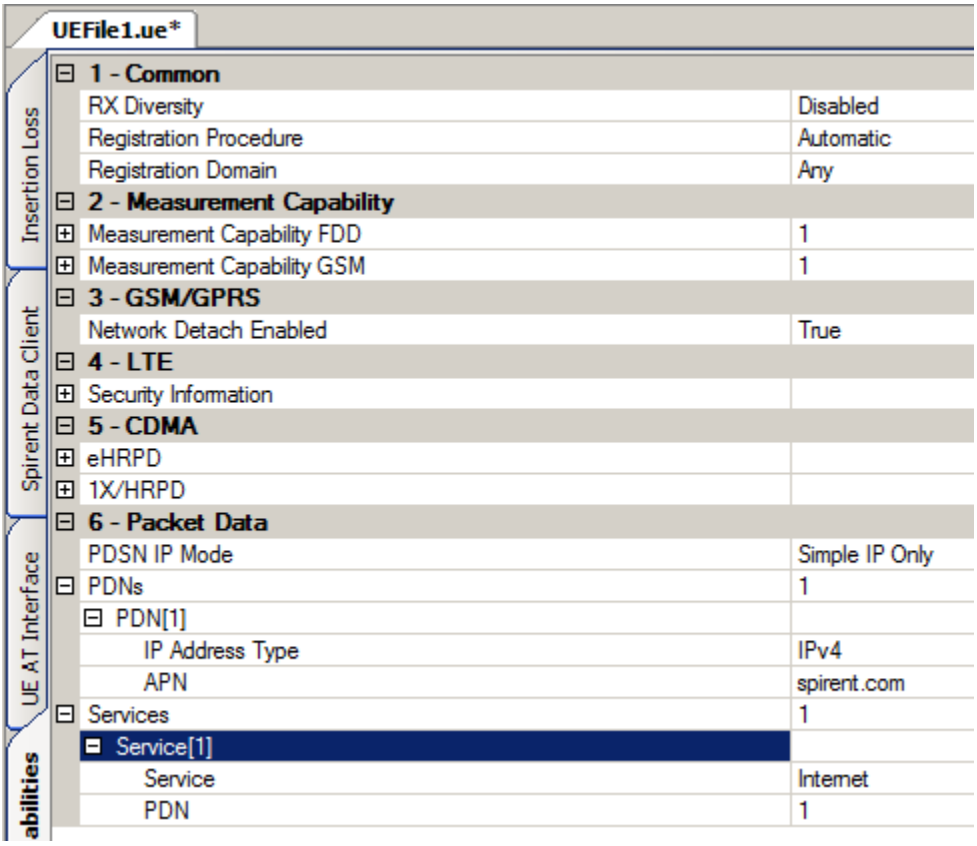

Figure 3-11: UE Parameters Window – UE Capability Parameters for PDN

NOTE: There is great variability in the AT commands supported by UE vendors and how reliably they work. Experimentation may be necessary to determine the best settings.

3.4. Configuring the Session Parameters

3.4.1. Session Control Parameters

Session Parameters control the execution of the session as shown in Figure 3-12.

- **Rerunning Test Cases**: These parameters control the automatic rerunning of test cases that end with a final result of "Incomplete" or "Failed".
- **Rerunning Test Case Iterations**: These parameters control the behavior of iteration-based test cases.

NOTE: Because Data Throughput – LTE test packs are not iteration-based; these parameters are not used.

- **Reset UE between Test Cases**: Resetting the UE between test cases can improve system performance and stability in some cases.

NOTE: The Data Throughput – LTE test packs automatically reset the UE at various points during the test; it is not necessary to set this parameter to "True".

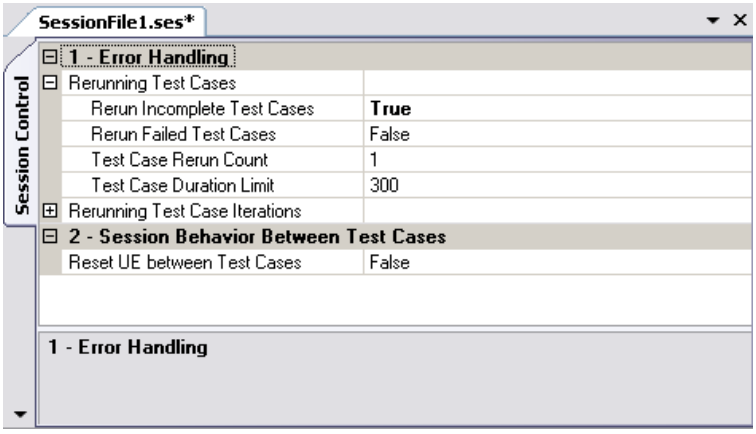

Figure 3-12: Session Parameters

3.4.2. eAirAccess Parameters

eAirAccess parameters control the execution of eAA, as shown in Figure 3-13.

- **LTE L1/L2 Logging Enabled**: This parameter enables or disables logging of eAirAccess L1/L2 messages.

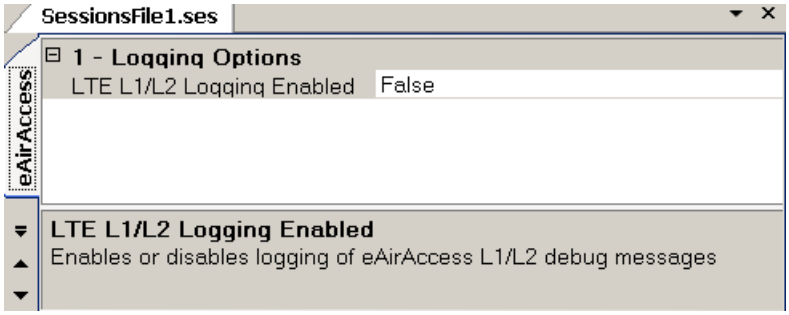

Figure 3-13: eAirAccess parameters

3.5. Selecting the Parameter Files for Session Execution

As indicated in the *Test Manager User Manual*, you cannot run a suite successfully unless it undergoes validation using the specified Platform, Session and UE Parameter files.

In the *Execute Session* window, select the **Session File**, the **UE File**, and the **Platform File**. After the Platform File is selected, select the **Platform** as shown in Figure 3-14.

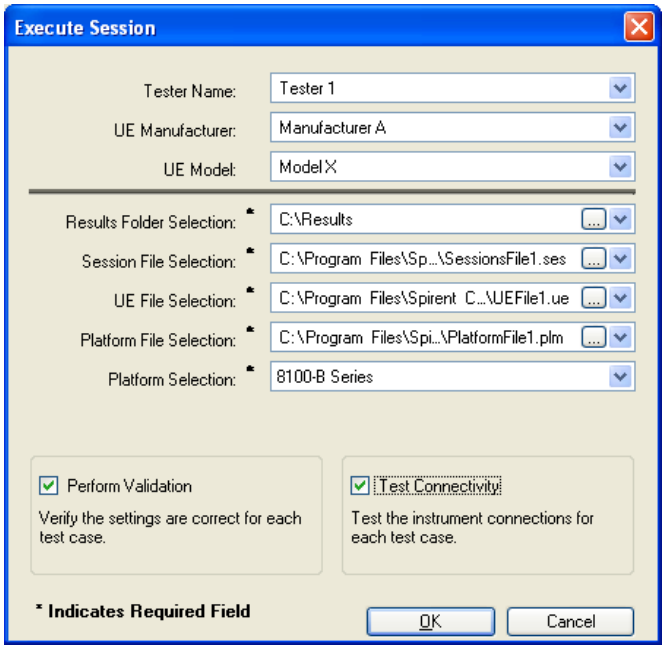

Figure 3-14: Selecting Parameter Files for Data Throughput – LTE Module

3.6. Locating the Test Suites and Test Cases

3.6.1. Locating Pre-defined Module Test Suites

1. In the Test Manager, select the **Suite Files** tab in the File Cabinet and open the **Suite Files** folder tree.

2. Open the **LTE Data Throughput** folder tree.
   All of the pre-defined Suites available for Data Throughput Testing display, as shown in Figure 3-15.

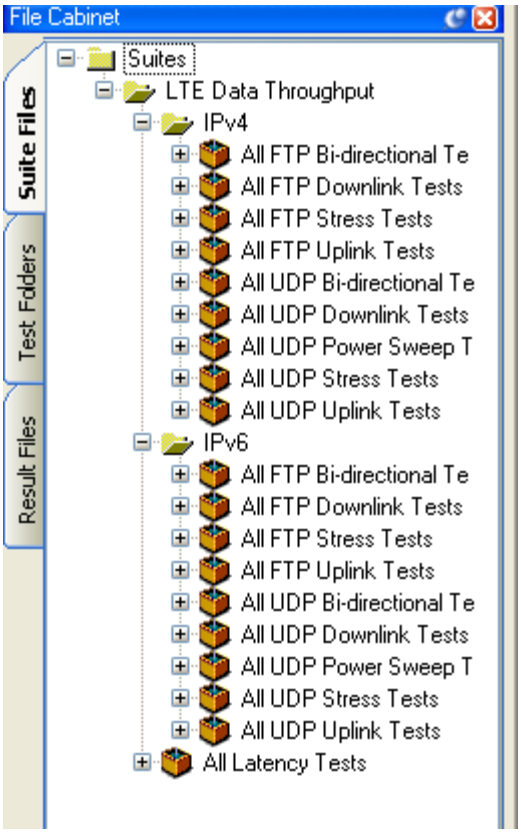

Figure 3-15: Locating Data Throughput - LTE Module Pre-defined Suites

3.6.2. Locating Module Test Cases

1. In the Test Manager, select the **Test Folders** tab in from the file Cabinet.
2. Open the **Test Folders** folder.
3. Open the **LTE›Data Throughput** subfolder.
   This folder contains the Data Throughput – LTE Test Cases, as shown in Figure 3-16.

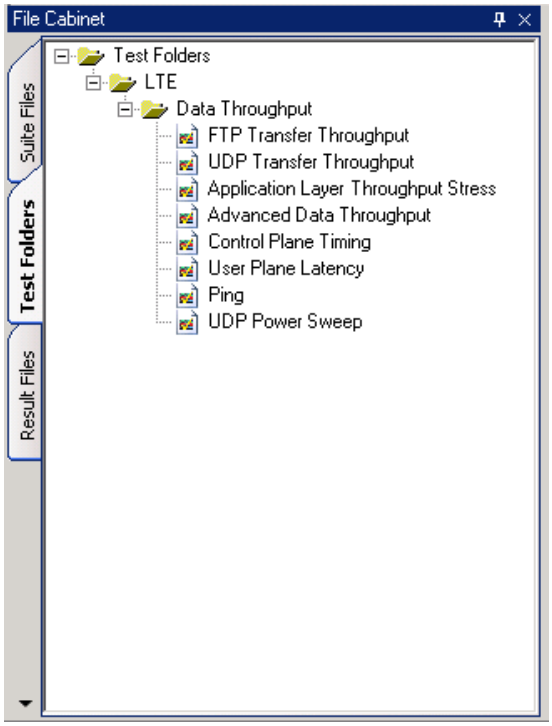

Figure 3-16: Data Throughput – LTE Test Cases

3.7. Creating a Custom Test Suite

To set up a custom Data Throughput – LTE test, you must create a Test Suite.

To create a Test Suite:

1. In the Test Manager Menu, select **File›New›Suite File**, as shown in Figure 3-17.

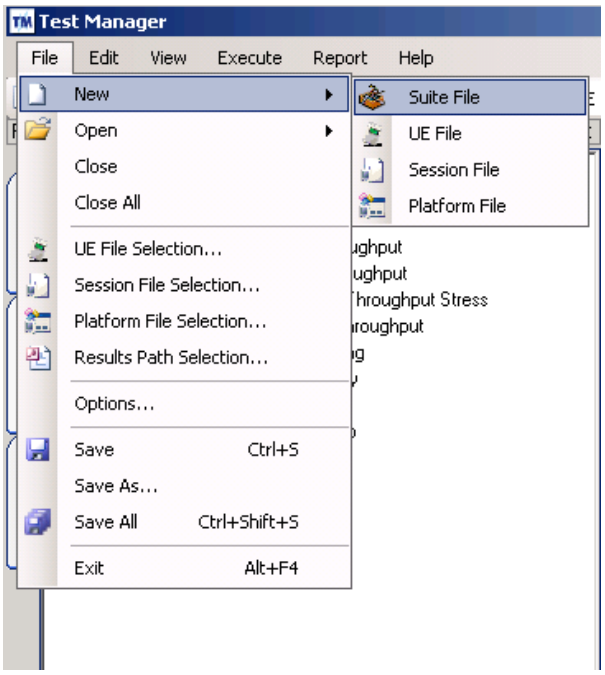

Figure 3-17: Creating a New Suite

2. You can also use the toolbar shortcuts available to create a new file, as shown in Figure 3-18.

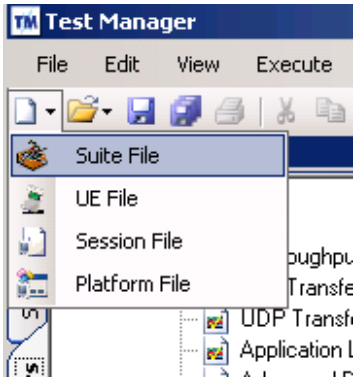

Figure 3-18: Creating a Suite File using the Toolbar Shortcut

3. A new *Test Suite* window opens with a default file name.
   This window allows you to sequence and arrange the tests.

4. To add a test from the Data Throughput – LTE test packs, drag the desired test from the **Module Files** tab of the File Cabinet on the left and move it over to your **Suite File** on the right, as shown in Figure 3-19 and Figure 3-20.

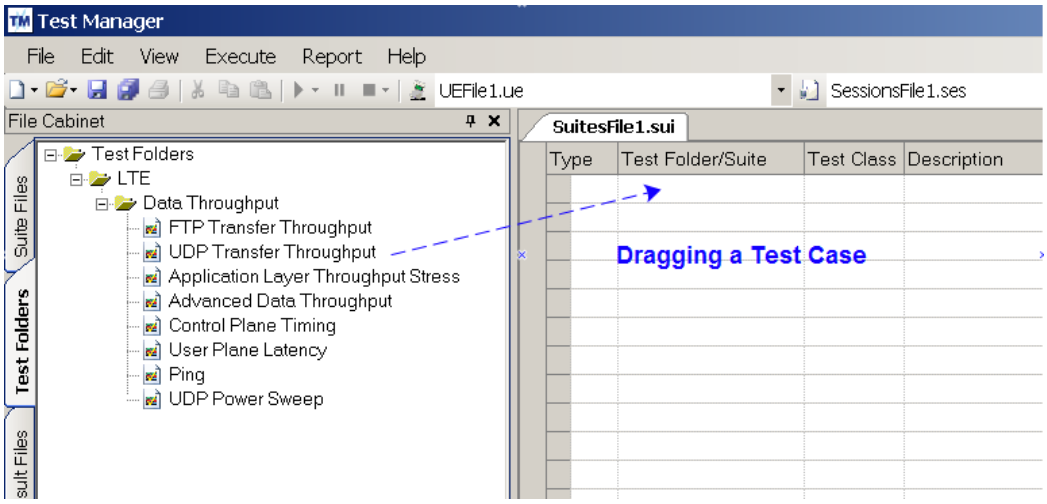

Figure 3-19: Transferring a Test Case into a Suite

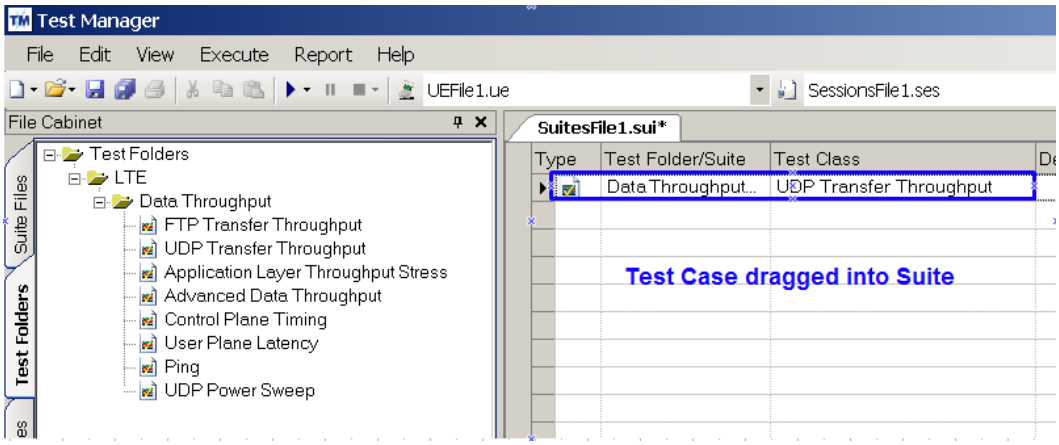

Figure 3-20: Successfully Transferred Test Case

5. Configure the parameters for each Test Case based on your testing needs. Refer to Section 3.6 and Chapter 4 for additional information on configuring Test Case Parameters.

6. When you have completed adding and sequencing the test cases, save the **Suite** file. The custom suite file displays in the file cabinet, as shown in Figure 3-21.

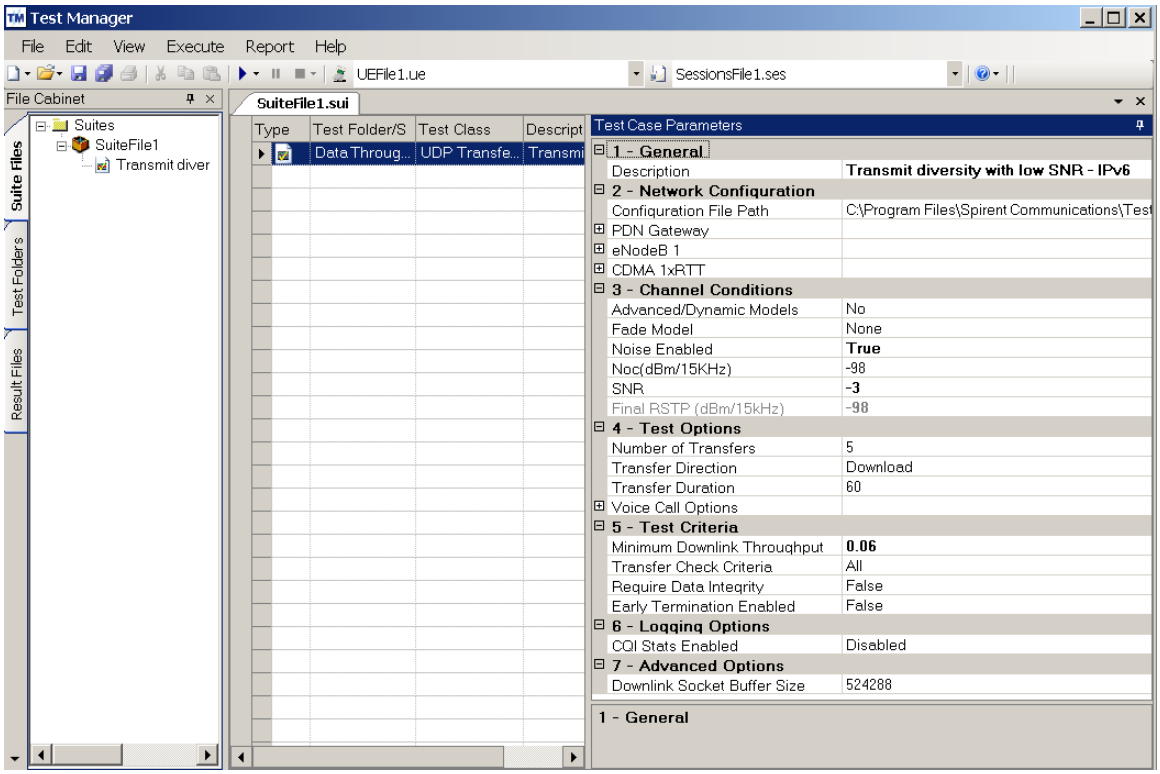

Figure 3-21: Customized Suite Saved to the File Cabinet

3.8. Configuring Test Case Parameters

1. In Test Manager, select the desired **Test Suite** from the **Parameters** tab in the File Cabinet.

2. In the *Suite Editor*, select the Test Case, as shown in Figure 3-22.

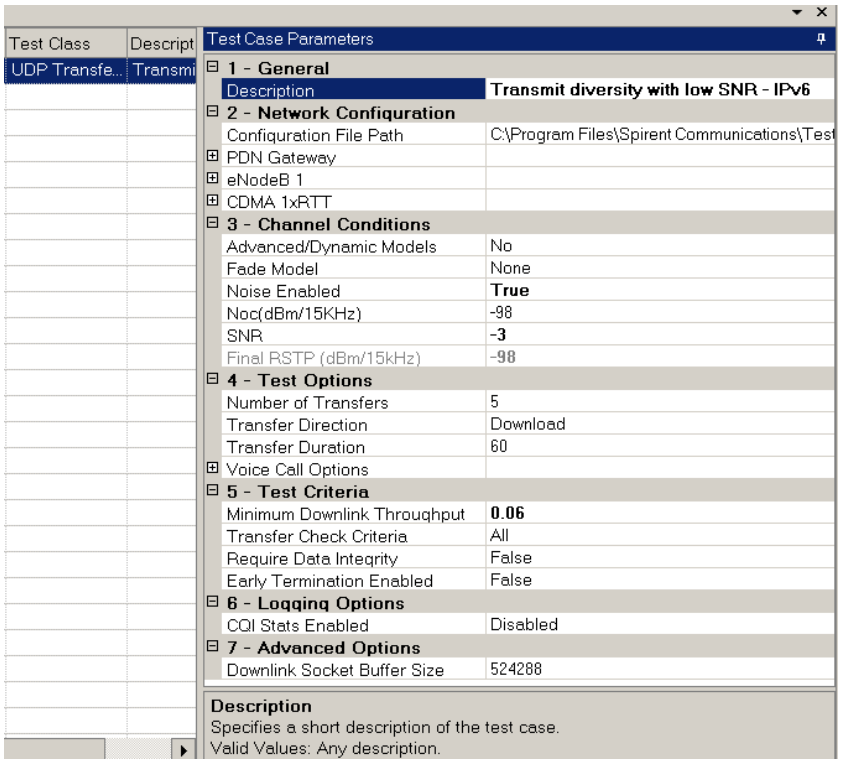

Figure 3-22: Configuring Test Case Parameters

3. Select the appropriate defining parameters for the test.
   For more information on setting parameters, refer to Chapter 4.

4. Save changes to the Suite File.

3.9. Running a Test Suite

After creating the custom test suite and configuring the test case parameters (refer to Section 3.6 on page 25 for details), or selecting a pre-defined test suite, you must ensure the suite passes validation.

As discussed in the *Test Manager User Manual*, the key requirements to run a user-defined suite are a valid Session, UE, and Platform file.

To run the test suite:

1. In the Test Manager, open the desired test suite from the **Suite Files** tab of the File cabinet, as shown in Figure 3-23.

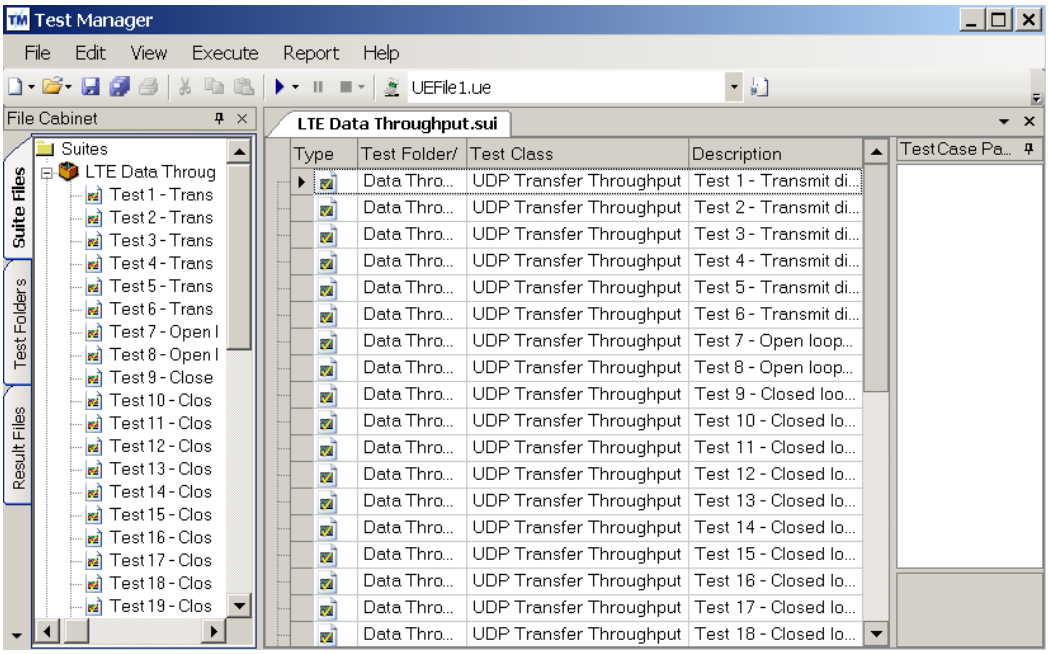

Figure 3-23: Loading a Data Throughput – LTE Test Suite

NOTE: Each Test Case in a pre-defined Suite has test case parameters configured to support the test definition. You do not have to alter them unless you are writing your own test suite. For more information on configuring test case parameters, refer to Section 3.6 on and Chapter 4: Test Reference.

2. In the Test Manager menu, select **Execute›Start Session›Run All** Test Cases to start executing the entire Test Suite.
   You also have the option of executing only the currently selected test case.
   The Execute Session window displays.

3. Select the appropriate parameter files and platform. For more information on selecting these files, refer to section 4.

4. If desired, specify the **Tester Name**, **UE Manufacturer**, and **UE Model**. These fields display on all reports you create based on the results of this session.

NOTE: The Results folder and Platform File selections are already set, it is not necessary to make changes to these fields.

5. Click **OK** to begin validation.
   If successful, the test session begins, as shown in Figure 3-24.

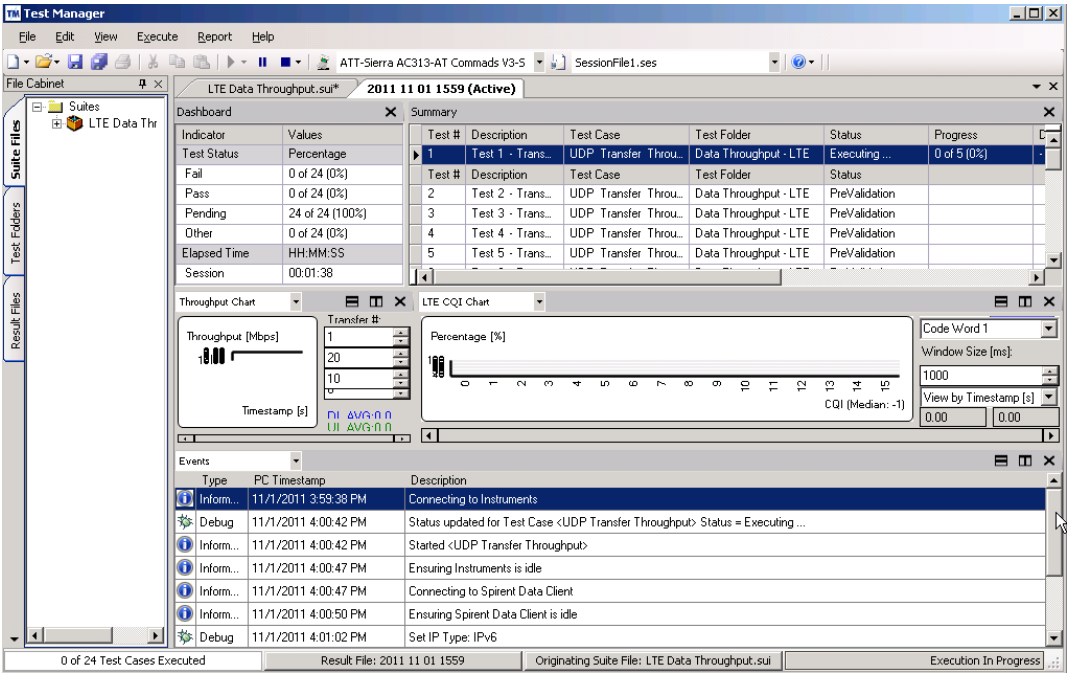

Figure 3-24: Test Session in Progress

3.10.Setting Up a New UE with the Data Client

To introduce or setup a new UE (or swap between more than one) connected to the Data Client PC, you need to configure the system to establish data throughput connectivity from the Controller PC, as well as the Application server. While both the Data Client and the Application Server are connected by the Ethernet cable, the data transfer throughput must occur via the Network Emulator interface.

To run a test with a new UE:

1. On the Data Client laptop, install the manufacturer software/drivers for the new UE. The UE software should support an installation configurable as a tethered modem.

NOTE: The Data Client laptop has a modem dial-up connection named TestDrive Data Connection configured for use with your UE. This is part of the installation and cannot be changed.

2. The Data Client laptop is pre-configured to support Client Dial-up connections for the tethered modem-configured UE under Test.
   Use the **TestDrive Data Connection** Dial-up networking setting on the laptop to set up the UE.

3. On the Data Client laptop, select **Control Panel›Network Connections**, right-click *TestDrive Data Connection* and select **Properties**, as shown in Figure 3-25.

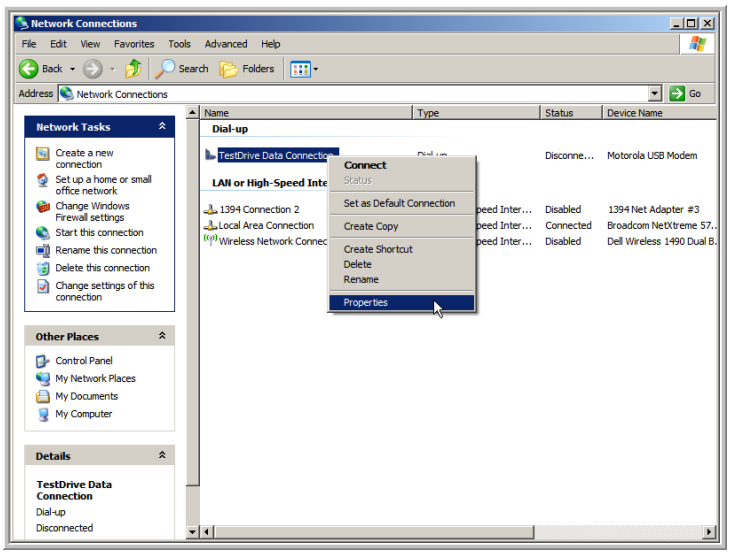

Figure 3-25: Data Client Network Connections

Figure 3-26: TestDrive Data Connections Properties Window – Selecting Current UE

4. Under the *General* tab, shown in Figure 3-26, select the correct **UE under Test** in the *Connect Using* list.

5. Refer to the UE specifications and enter the correct dial-in number.
   By default, the Data Client laptop is set to a dial-in Number of ***99#**. Note that ***99#** is one of two AT Command GPRS specifications for a request to use the Packet Domain service. The other common dial-in number is ***98#**.

6. Your new UE is now configured for testing.

4. Test Reference

4.1. Overview

This chapter describes the Data Throughput – LTE Module test cases in greater detail, including the algorithms implemented during test execution.

The information is grouped into the following subsections:

1. Test Suite Execution
2. Data Throughput – LTE Test Cases
3. Description of Data Throughput – LTE Module Test Parameters

4.2. Test Suite Execution

This section describes the sequence of operations performed during the execution of a Test Suite from the Test Manager.

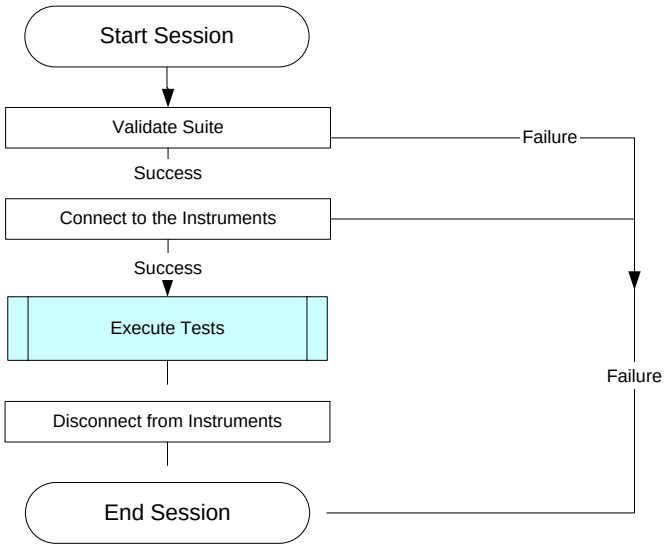

Figure 4-1: Test Suite Execution Flowchart

4.3. Data Throughput – LTE Test Cases

This section describes the test cases that facilitate the Testing functionality of the Data Throughput – LTE Test Packs.

1. FTP Transfer Throughput – Test
2. UDP Transfer Throughput – Test
3. Application Layer Throughput Stress - Test
4. Control Plane Timing – Test
5. User Plane Latency – Test
6. UDP Power Sweep - Test

4.3.1. FTP Transfer Throughput – Test

4.3.1.1 Description

This test case is designed to evaluate LTE Data Throughput performance of the UE during a LTE data call. Once the initial conditions are configured, the system waits to detect the initial network attach. Following the network attach, different parameters are configured such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If SVLTE is enabled, this test case is designed to evaluate LTE Data Throughput performance of the UE during a LTE Data Call and a 1xRTT Voice Call. The parameters "CDMA 1xRTT Enabled" and "Call Enabled" should be set to **True** to support SVLTE. After configuring the initial conditions, the system waits to detect the initial network attach. Following the network attach, different parameters can be configured; such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If Advanced/Dynamic Models is enabled, this test case evaluates LTE Data Throughput with integration of SR5500M to enable advanced channel emulation. You can select the **.wce** file where all Fading and Noise parameters are set.

NOTE: If you use a Windows XP laptop and Application Server with a Windows 2003 server, the maximum throughput in IPv6 will be lower than expected.
This is because Microsoft does not support TCP window scaling for IPv6 on those platforms.

4.3.1.2 Required Test Equipment

This test requires the following equipment:

- LTE Network Emulators: Depending on the technologies specified in the configured scenarios.
- CDMA 1xRTT Network Emulators: Depending on the parameters specified in the configured scenarios.
- SR8078 TCU: Depending on the parameters specified in the configured scenarios.
- SR5500M: Depending on the parameters specified in the configured scenarios.

4.3.1.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	• Configuration File Path • PDN Gateway o PDNs ▪ PDN ▪ IP Address Type ▪ Default Barer QCI ▪ Enable Dedicated Bearers • eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth o MCC o MNC o RLC ▪ Mode o MAC ▪ Downlink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize ▪ Uplink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize o Physical ▪ RSTP

Test Parameters	
	▪ Transmission Mode ▪ CFI ▪ UE Specific Search Space Aggregation ▪ EPRE Ratios • Synchronization Signals o PSS RA o PSS RB o SSS RA o SSS RB • Control Channels o PBCH RA o PBCH RB o PCFICH RA o PCFICH RB o PDCCH RA o PDCCH RB o PHICH RA o PHICH RB • Shared Channels o PDSCH RA o PDSCH RB • CQI Parameters o CQI Reporting Type o Periodic CQI - ConfigIndex o CQI Reporting Channel o CQI Feedback Type o CQI Reporting Mode o Default Imcs for CW1 o Default Imcs for CW2 o CQI Mapping Type o CQI Mapping File Path • CDMA 1xRTT o CDMA 1xRTT Enabled o SID o NID o Band Class o Channel Number o Radio Configuration o Service Options o Power Control o RF Power Level
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model o MIMO Correlation o MIMO Correlation Matrix Alpha o MIMO Correlation Matrix Beta

Test Parameters	

	• Noise Enabled
	  o Noc
	  o SNR
	• Final RSTP(dBm/15kHz)

Test Options	• Number of Transfers
	• Transfer Direction
	• FTP Optimization Enabled
	• Max Transfer Duration
	• Download File Name
	• Upload File Name
	• Voice Call Options
	  o Call Enabled
	  o Call Direction
	  o Call Duration
	  o Delay Between Calls

Test Criteria	• Advanced Criteria Enabled • Cat 1 Required Downlink Throughput • Cat 2 Required Downlink Throughput • Cat 3 Required Downlink Throughput • Cat 4 Required Downlink Throughput • Cat 5 Required Downlink Throughput • Cat 1 Required Uplink Throughput • Cat 2 Required Uplink Throughput • Cat 3 Required Uplink Throughput • Cat 4 Required Uplink Throughput • Cat 5 Required Uplink Throughput • Minimum Downlink Throughput • Minimum Uplink Throughput • Transfer Check Criteria • Require Data Integrity • Early Termination Enabled
Logging Options	• CQI Stats Enabled • RLC Layer Stats Enabled
Advanced Options	• Downlink Socket Buffer Size • Uplink Socket Buffer Size

4.3.1.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.1.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average throughput exceeding the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice calls all succeed or fail once.	Pass
The test completes performing average throughput not meeting the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice call failed twice can also cause the case to have a "Fail" result.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.3.2. UDP Transfer Throughput – Test

4.3.2.1 Description

This test case is designed to evaluate UE's LTE data throughput performance during a LTE data call. Once the initial conditions are configured, the system waits to detect the initial network attach. Following the network attach, different parameters are configured such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If SVLTE is enabled, this test case is designed to evaluate LTE Data Throughput performance of the UE during a LTE Data Call and a 1xRTT Voice Call. The parameters "CDMA 1xRTT Enabled" and "Call Enabled" should be set to **True** to support SVLTE. After configuring the initial conditions, the system waits to detect the initial network attach. Following the network attach, different parameters can be configured; such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If Advanced/Dynamic Models is enabled, this test case evaluates LTE Data Throughput with integration of SR5500M to enable advanced channel emulation. You can select the .wce file where the Fading and Noise parameters are set.

4.3.2.2 Required Test Equipment

This test requires the following equipment:

- **LTE Network Emulators**: Depending on the technologies specified in the configured scenarios.
- **CDMA 1xRTT Network Emulator**: Depending on the parameters specified in the configured scenarios.
- **SR8078 TCU**: Depending on the parameters specified in the configured scenarios.
- **SR5500M**: Depending on the parameters specified in the configured scenarios.

4.3.2.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	• Configuration File Path • PDN Gateway o PDNs • PDN • IP Address Type • Default Barer QCI • Enable Dedicated Bearers • eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth o MCC o MNC o RLC ▪ Mode o MAC ▪ Downlink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize ▪ Uplink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize o Physical ▪ RSTP ▪ Transmission Mode ▪ CFI ▪ UE Specific Search Space Aggregation ▪ EPRE Ratios • Synchronization Signals o PSS RA o PSS RB o SSS RA o SSS RB • Control Channels o PBCH RA o PBCH RB o PCFICH RA

Test Parameters	
	o PCFICH RB o PDCCH RA o PDCCH RB o PHICH RA o PHICH RB • Shared Channels o PDSCH RA o PDSCH RB • CQI Parameters o CQI Reporting Type o Periodic CQI - ConfigIndex o CQI Reproting Channel o CQI Feedback Type o CQI Reporting Mode o Default Imcs for CW1 o Default Imcs for CW2 o CQI Mapping Type o CQI Mapping File Path • CDMA 1xRTT • CDMA 1xRTT Enabled • SID • NID • Band Class • Channel Number • Radio Configuration • Service Options • Power Control o RF Power Level
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model • MIMO Correlation • MIMO Correlation Matrix Alpha • MIMO Correlation Matrix Beta • Noise Enabled • Noc • SNR • Final RSTP(dBm/15kHz)
Test Options	• Number of Transfers • Transfer Direction • Transfer Duration • Blaster Rate • Downlink Blaster Rate • Uplink Blaster Rate • Voice Call Options

Test Parameters	
	o Call Enabled o Call Direction o Call Duration o Delay Between Calls
Test Criteria	• Advanced Criteria Enabled o Cat 1 Required Downlink Throughput o Cat 2 Required Downlink Throughput o Cat 3 Required Downlink Throughput o Cat 4 Required Downlink Throughput o Cat 5 Required Downlink Throughput o Cat 1 Required Uplink Throughput o Cat 2 Required Uplink Throughput o Cat 3 Required Uplink Throughput o Cat 4 Required Uplink Throughput o Cat 5 Required Uplink Throughput • Minimum Downlink Throughput • Minimum Uplink Throughput • Transfer Check Criteria • Require Data Integrity • Early Termination Enabled
Logging Options	• CQI Stats Enabled • RLC Layer Stats Enabled
Advanced Options	• Downlink Socket Buffer Size • Uplink Socket Buffer Size • IPv4 UDP Packet Size • IPv6 UDP Packet Size

4.3.2.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.2.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average throughput exceeding the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice calls all succeed or fail once.	Pass
The test completes performing average throughput not meeting the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice call failed twice can also cause the case to have “Fail” result.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.3.3. Application Layer Throughput Stress – Test

4.3.3.1 Description

This test case is designed to evaluate UE's LTE data throughput performance during a LTE data call. Once the initial conditions are configured, the system waits to detect the initial network attach. Following the network attach, different parameters are configured such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If SVLTE is enabled, this test case is designed to evaluate LTE Data Throughput performance of the UE during a LTE Data Call and a 1xRTT Voice Call. The parameters "CDMA 1xRTT Enabled" and "Call Enabled" should be set to **True** to support SVLTE. After configuring the initial conditions, the system waits to detect the initial network attach. Following the network attach, different parameters can be configured; such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If Advanced/Dynamic Models is enabled, this test case evaluates LTE Data Throughput with integration of SR5500M to enable advanced channel emulation. You can select the .wce file where the Fading and Noise parameters are set.

4.3.3.2 Required Test Equipment

This test requires the following equipment:

- **LTE Network Emulators**: Depending on the technologies specified in the configured scenarios.
- **CDMA 1xRTT Network Emulators**: Depending on the technologies specified in the configured scenarios.
- **SR8078 TCU**: Depending on the parameters specified in the configured scenarios.
- **SR5500M**: Depending on the parameters specified in the configured scenarios.

4.3.3.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	• Configuration File Path • PDN Gateway • PDNs • PDN • IP Address Type • Default Barer QCI • Enable Dedicated Bearers • eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth o MCC o MNC o RLC ▪ Mode o MAC ▪ Downlink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize ▪ Uplink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize o Physical ▪ RSTP ▪ Transmission Mode ▪ CFI ▪ UE Specific Search Space Aggregation ▪ EPRE Ratios • Synchronization Signals o PSS RA o PSS RB o SSS RA o SSS RB • Control Channels o PBCH RA o PBCH RB

Test Parameters	
	o PCFICH RA o PCFICH RB o PDCCH RA o PDCCH RB o PHICH RA o PHICH RB • Shared Channels o PDSCH RA o PDSCH RB • CQI Parameters o CQI Reporting Type o Periodic CQI - ConfigIndex o CQI Reproting Channel o CQI Feedback Type o CQI Reporting Mode o Default Imcs for CW1 o Default Imcs for CW2 o CQI Mapping Type o CQI Mapping File Path • CDMA 1xRTT • CDMA 1xRTT Enabled • SID • NID • Band Class • Channel Number • Radio Configuration • Service Options • Power Control o RF Power Level
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model • MIMO Correlation • MIMO Correlation Matrix Alpha • MIMO Correlation Matrix Beta • Noise Enabled • Noc • SNR • Final RSTP(dBm/15kHz)
Test Options	• Stress Duration • Transfer Direction • Transfer Protocol • FTP Optimization Enabled • Max Transfer Duration • Download File Name • Upload File Name

Test Parameters	
	• Transfer Duration • Blaster Rate • Downlink Blaster Rate • Uplink Blaster Rate • Voice Call Options o Call Enabled o Call Direction o Call Duration o Delay Between Calls
Test Criteria	• Advanced Criteria Enabled o Cat 1 Required Downlink Throughput o Cat 2 Required Downlink Throughput o Cat 3 Required Downlink Throughput o Cat 4 Required Downlink Throughput o Cat 5 Required Downlink Throughput o Cat 1 Required Uplink Throughput o Cat 2 Required Uplink Throughput o Cat 3 Required Uplink Throughput o Cat 4 Required Uplink Throughput o Cat 5 Required Uplink Throughput • Minimum Downlink Throughput • Minimum Uplink Throughput • Transfer Check Criteria • Require Data Integrity • Early Termination Enabled
Logging Options	• CQI Stats Enabled • RLC Layer Stats Enabled
Advanced Options	• Downlink Socket Buffer Size • Uplink Socket Buffer Size • IPv4 UDP Packet Size • IPv6 UDP Packet Size

4.3.3.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.3.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average throughput exceeding the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice calls all succeed or fail once.	Pass

Testing Scenario	Test Result
The test completes performing average throughput not meeting the Minimum Downlink (Uplink) Throughput. If SVLTE is enabled, the voice call failed twice can also cause the case to have "Fail" result.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.3.4. Control Plane Timing – Test

4.3.4.1 Description

This test case is designed to measure the control plane latency of the UE from initial attachment to the network, and transition from RRC_Idle to RRC_Connected state.

If Advanced/Dynamic Models is enabled, this test case evaluates the control plane latency of the UE with integration of SR5500M to enable advanced channel emulation. You can select the .wce file where the Fading and Noise parameters are set.

4.3.4.2 Required Test Equipment

This test requires the following equipment:

- LTE Network Emulators: Depending on the technologies specified in the configured scenarios.
- SR8078 TCU: Depending on the parameters specified in the configured scenarios.
- SR5500M: Depending on the parameters specified in the configured scenarios.

4.3.4.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	▪ Configuration File Path ▪ PDN Gateway ▪ PDNs ▪ PDN ▪ IP Address Type ▪ Default Barer QCI ▪ Enable Dedicated Bearers ▪ eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth

Test Parameters	
	○ MCC ○ MNC ○ RLC ▪ Mode ○ Physical ▪ RSTP ▪ Transmission Mode ▪ CQI Reporting Type ▪ Periodic CQI ConfigIndex ▪ EPRE Ratios ▪ Synchronization Signals ○ PSS RA ○ PSS RB ○ SSS RA ○ SSS RB ▪ Control Channels ○ PBCH RA ○ PBCH RB ○ PCFICH RA ○ PCFICH RB ○ PDCCH RA ○ PDCCH RB ○ PHICH RA ○ PHICH RB ▪ Shared Channels ○ PDSCH RA ○ PDSCH RB
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model • MIMO Correlation • MIMO Correlation Matrix Alpha • MIMO Correlation Matrix Beta • Noise Enabled • Noc • SNR • Final RSTP(dBm/15kHz)
Test Options	• Execution Limit • Iterations • Test Time • Latency Measurement • Initiation
Test Criteria	• Pass/Fail Measurement(s) • Maximum Connect Time • Maximum Attach Time

Test Parameters	
	• Iteration Check Criteria • Early Termination Enabled
Logging Options	• CQI Stats Enabled

4.3.4.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.4.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average measurement time less than or equal to maximum connect (attach) time.	Pass
The test completes performing average measurement time more than maximum connect (attach) time.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.3.5. User Plane Timing – Test

4.3.5.1 Description

This test case is designed to evaluate the performance of the UE for user plane round trip delay.

If Advanced/Dynamic Models is enabled, this test case evaluates the performance of the UE in user plane round trip delay with integration of SR5500M to enable advanced channel emulation. You can select the **.wce** file where the Fading and Noise parameters are set.

4.3.5.2 Required Test Equipment

This test requires the following equipment:

- **LTE Network Emulators**: Depending on the technologies specified in the configured scenarios.
- **SR8078 TCU**: Depending on the parameters specified in the configured scenarios.
- **SR5500M**: Depending on the parameters specified in the configured scenarios.

4.3.5.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	• Configuration File Path • PDN Gateway o PDNs ▪ PDN ▪ IP Address Type ▪ Default Barer QCI ▪ Enable Dedicated Bearers • eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth o MCC o MNC o RLC ▪ Mode o MAC ▪ Downlink Reference Channel • Scheduling Module • RB Allocation

Test Parameters	
	• Allocated RBs • Modulation • TBSize ▪ Uplink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize o Physical ▪ RSTP ▪ Transmission Mode ▪ CFI ▪ UE Specific Search Space Aggregation ▪ CQI Reporting Type ▪ Periodic CQI ConfigIndex ▪ EPRE Ratios • Synchronization Signals o PSS RA o PSS RB o SSS RA o SSS RB • Control Channels o PBCH RA o PBCH RB o PCFICH RA o PCFICH RB o PDCCH RA o PDCCH RB o PHICH RA o PHICH RB • Shared Channels o PDSCH RA o PDSCH RB
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model • MIMO Correlation • MIMO Correlation Matrix Alpha • MIMO Correlation Matrix Beta • Noise Enabled • Noc • SNR • Final RSTP(dBm/15kHz)
Test Options	• Execution Limit • Iterations • Test Time

Test Parameters	
	• Ping Direction • Packet Size
Test Criteria	• Minimum Delay • Delay Check Criteria • Maximum Timeouts • Early Termination Enabled
Logging Options	• CQI Stats Enabled

4.3.5.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.5.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average round trip delay less than or equal to Minimum Delay.	Pass
The test completes performing average round trip delay more than Minimum Delay.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.3.6. UDP Power Sweep – Test

4.3.6.1 Description

This test case is designed to measure UE's data throughput variation by varying the power sweep. Once the initial conditions are configured, the system waits to detect the initial network attach. Once the initial conditions are configured, the system waits to detect the initial network attach. Following the network attach, different parameters are configured such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If SVLTE is enabled, this test case is designed to evaluate LTE Data Throughput performance of the UE during a LTE Data Call and a 1xRTT Voice Call. The parameters "CDMA 1xRTT Enabled" and "Call Enabled" should be set to **True** to support SVLTE. After configuring the initial conditions, the system waits to detect the initial network attach. Following the network attach, different parameters can be configured; such as RF impairments (AWGN, Fade Profile, MIMO), using configurable Resource Block Allocations.

If Advanced/Dynamic Models is enabled, this test case evaluates LTE Data Throughput with integration of SR5500M to enable advanced channel emulation. You can select the .wce file where the Fading and Noise parameters are set.

4.3.6.2 Required Test Equipment

This test requires the following equipment:

- LTE Network Emulators: Depending on the technologies specified in the configured scenarios.
- CDMA 1xRTT Network Emulators: Depending on the technologies specified in the configured scenarios.
- SR8078 TCU: Depending on the parameters specified in the configured scenarios.
- SR5500M: Depending on the parameters specified in the configured scenarios.

4.3.6.3 Test Parameters

The following test parameters are supported for this test.

Test Parameters	
General	• Description
Network Configuration	• Configuration File Path • PDN Gateway o PDN ▪ IP Address Type ▪ Default Barer QCI ▪ Enable Dedicated Bearers • eNodeB 1 o Operating Band o Downlink Channel Number o Downlink Bandwidth o MCC o MNC o RLC ▪ Mode o MAC ▪ Downlink Reference Channel • Scheduling Module • RB Allocation • Allocated RBs • Modulation • TBSize ▪ Uplink Reference Channel • Scheduling Module • RB Allocation

Test Parameters	
	• Allocated RBs • Modulation • TBSize o Physical ▪ RSTP Sweep Options • Initial RSTP • Final RSTP • Step ▪ Transmission Mode ▪ CFI ▪ UE Specific Search Space Aggregation ▪ EPRE Ratios • Synchronization Signals o PSS RA o PSS RB o SSS RA o SSS RB • Control Channels o PBCH RA o PBCH RB o PCFICH RA o PCFICH RB o PDCCH RA o PDCCH RB o PHICH RA o PHICH RB • Shared Channels o PDSCH RA o PDSCH RB • CQI Parameters o CQI Reporting Type o Periodic CQI - ConfigIndex o CQI Reproting Channel o CQI Feedback Type o CQI Reporting Mode o Default Imcs for CW1 o Default Imcs for CW2 o CQI Mapping Type o CQI Mapping File Path • CDMA 1xRTT o CDMA 1xRTT Enabled o SID o NID o Band Class o Channel Number

Test Parameters	
	o Radio Configuration o Service Options o Power Control o RF Power Level
Channel Conditions	• Advanced/Dynamic Models • SR5500 Configuration File • Fade Model • MIMO Correlation • MIMO Correlation Matrix Alpha • MIMO Correlation Matrix Beta • Noise Enabled • Noc • SNR
Test Options	• Number of Transfers • Transfer Direction • Transfer Duration • Blaster Rate • Downlink Blaster Rate • Uplink Blaster Rate • Voice Call Options o Call Enabled o Call Direction o Call Duration o Delay Between Calls
Test Criteria	• Advanced Criteria Enabled • Minimum Downlink (Uplink) Throughput • Minimum Downlink (Uplink) Throughput with UE Category • Transfer Check Criteria • Require Data Integrity • Early Termination Enabled
Logging Options	• CQI Stats Enabled • RLC Layer Stats Enabled
Advanced Options	• Downlink Socket Buffer Size • Uplink Socket Buffer Size • IPv4 UDP Packet Size • IPv6 UDP Packet Size

4.3.6.4 Test Results

The following results are generated for this test:

- Pass/Fail

4.3.6.5 Pass / Fail Criteria

Testing Scenario	Test Result
The test completes performing average throughput exceeds the Minimum Downlink (Uplink) Throughput for each RSTP value. If SVLTE is enabled, the voice calls all succeed or fail once.	Pass
The test completes performing average throughput does not meeting the Minimum Downlink (Uplink) Throughput for each RSTP value. If SVLTE is enabled, if the voice call fails twice, it can cause the test case to have a “Fail” result.	Fail
The test cannot complete due to UE/Network Failures or an unknown failure.	Incomplete (Other)

4.4. Description of Data Throughput – LTE Module Test Parameters

Most testing tasks can be accomplished using the defined User Test Suites. For individual testing needs, you can create custom Test Suites using the Module Test Cases and user-defined parameters.

You can change the following Test Parameters to define your testing needs:

- Network Configuration
- Channel Conditions
- Test Options
- Test Criteria

These parameters are described in detail in the following sections.

4.4.1. General

Parameter
Description Specifies a short description for the test case.

4.4.2. Network Configuration

Parameter
Configuration File Path Specifies the eAirAccess Configuration File to be loaded. This file contains the configuration details of the eNodeB, MME, PGW, HSS and SGW.
PDN Gateway **PDNs → IP Address Type** Specifies the type of PDN to configure. Valid Values: IPv4, IPv6. **PDNs → Default Bearer QCI** Specifies QCI for the default bearer. Valid Range: 1 to 9. **PDNs → Enable Dedicated Bearers** Enables or disables the use of dedicated bearers.

Parameter
eNodeB 1 **eNodeB 1→ Operating Band** Sets the operating band. Supported Band is 1, 2, 4, 7, 10, 13, 14 and 17. **eNodeB 1→ Downlink Channel Number** Sets the downlink channel number. **eNodeB 1→ Downlink Bandwidth** Sets the downlink bandwidth (MHz). **eNodeB 1→ Security Information** Sets the Security information. **eNodeB 1→ MCC** Sets the MCC. **eNodeB 1→ MNC** Sets the MNC. **eNodeB 1→ RLC** Sets the operating band. **RLC-› Mode** Sets the RLC transmission modes.
eNodeB 1→ MAC **MAC-›Downlink Reference Channel-›Scheduling Mode** Sets the Scheduler Mode. **MAC-›Downlink Reference Channel-›RB Allocation** Sets the Resource Block Allocation type. **MAC-›Downlink Reference Channel-›Allocated RBs** Sets the number of Resource Blocks to be allocated. **MAC-›Downlink Reference Channel-›Start RB** Sets the starting index for Resource Block Allocation. **MAC-›Downlink Reference Channel-›Modulation** Specifies the Modulation type. **MAC-›Downlink Reference Channel-›TBSize** Specifies the TBSize type. **MAC-›Uplink Reference Channel-›Scheduling Mode** Sets the Scheduler Mode. **MAC-› Uplink Reference Channel-›RB Allocation** Sets the Resource Block Allocation type. **MAC-› Uplink Reference Channel-›Allocated RBs** Sets the number of Resource Blocks to be allocated. **MAC-› Uplink Reference Channel-›Start RB** Sets the starting index for Resource Block Allocation. **MAC-› Uplink Reference Channel-›Modulation** Specifies the Modulation type. **MAC-› Uplink Reference Channel-›TBSize** Specifies the TBSize type.

Parameter
eNodeB 1→ Physical
Physical -› RSTP
Sets the Reference Signal Transmit Power (dBm).
Physical -› Reference Signal Ratio
Sets the cell-specific reference signal power ratio (Ers/Ior) in dB.
Physical -› Transmission Mode
Sets the transmission mode.
Physical -› CFI
Sets the CFI value.
Physical -› Aggregation Level
Sets the UE-Specific Search Space Aggregation (in CCEs).
Physical -› CQI Parameters -› CQI Reporting Type
Set the CQI Reporting Type
Physical -› CQI Parameters -› Periodic CQI - ConfigIndex
Set the CQI Configure Index
Physical -› CQI Parameters -› CQI Reporting Channel
Set the CQI Reporting Channel
Physical -› CQI Parameters -› CQI Feedback Type
Set the CQI Reporting Feedback Type
Physical -› CQI Parameters -› CQI Reporting Mode
Indicates the CQI Reporting Mode
Physical -› CQI Parameters -› Default Imcs for CW1
Set the default Imcs for CW1 if no CQI reported
Physical -› CQI Parameters -› Default Imcs for CW2
Set the default Imcs for CW2 if no CQI reported
Physical -› CQI Parameters -› CQI Mapping Type
Set the CQI Mapping Type
Physical -› CQI Parameters -› CQI Mapping File Path
Set the CQI Mapping File Path
Physical -› EPRE Ratios -› Synchronization Signals -› PSS RA
Specifies the PSS-to-RS EPRE ratio (Pa)in Db.
Physical -› EPRE Ratios -› Synchronization Signals -› PSS RB
Specifies the PSS-to-RS EPRE ratio (Pb)in Db.
Physical -› EPRE Ratios -› Synchronization Signals -› SSS RA
Specifies the SSS-to-RS EPRE ratio (Pa) in Db.
Physical -› EPRE Ratios -› Synchronization Signals -› SSS RA
Specifies the SSS-to-RS EPRE ratio (Pb) in Db.
Physical -› EPRE Ratios -› Control Channels -› PBCH RA
Specifies the PBCH-to-RS EPRE ratio (Pa) in Db.
Physical -› EPRE Ratios -› Control Channels -› PBCH RB
Specifies the PBCH-to-RS EPRE ratio (Pb) in Db.
Physical -› EPRE Ratios -› Control Channels -› PCFICH RA
Specifies the PCFICH-to-RS EPRE ratio (Pa) in Db.
Physical -› EPRE Ratios -› Control Channels -› PCFICH RA
Specifies the PCFICH-to-RS EPRE ratio (Pb) in Db.
Physical -› EPRE Ratios -› Control Channels -› PDCCH RA
Specifies the PDCCH-to-RS EPRE ratio (Pa) in Db.
Physical -› EPRE Ratios -› Control Channels -› PDCCH RA
Specifies the PDCCH-to-RS EPRE ratio (Pb) in Db.
Physical -› EPRE Ratios -› Control Channels -› PHICH RA

Parameter
CDMA 1Xrtt **CDMA 1Xrtt → CDMA 1Xrtt Enabled** Enable or disable CDMA 1Xrtt. **CDMA 1Xrtt → SID** Sets the SID for CDMA 1Xrtt. **CDMA 1Xrtt → NID** Sets the NID for CDMA 1Xrtt. **CDMA 1Xrtt → Band Class** Sets the Band Class for CDMA 1Xrtt. **CDMA 1Xrtt → Channel Number** Sets the Channel Number for CDMA 1Xrtt. **CDMA 1Xrtt → Radio Configuration** Sets the Radio Configuration for CDMA 1Xrtt. **CDMA 1Xrtt → Service Options** Sets the Service Options for CDMA 1Xrtt. **CDMA 1Xrtt → Power Control** Sets the Power Control for CDMA 1Xrtt. **CDMA 1Xrtt → RF Power level** Sets the BTS Power Level (dBm).

4.4.3. Channel Conditions

Parameter
Advanced/Dynamic Models Sets the Advanced/Dynamic Models. Valid Values: Yes, No
SR5500M Configuration File Specifies the SR5500M Configuration File to be loaded.
Fade Model Sets the use of standard LTE fade models. Available profiles: EVA5, EPA5,ETU70, EVA70, HST
MIMO Correlation Sets the MIMO correlation. Valid Values: Low, Medium High
MIMO Correlation Matrix Alpha Sets the Alpha value of MIMO Correlation Matrix
MIMO Correlation Matrix Beta • Sets the Beta value of MIMO Correlation Matrix
Noise Enabled Enables or disables the noise.
Noc Sets the power spectral density (dBm/15KHz) of a white noise source as measured at the UE antenna connector.
SNR Sets the cumulative Signal to Noise Ratio (Db) for UE Channel(s).

Parameter
Final RSTP Display the final RSTP after setting SNR and fading (dBm/15kHz).

4.4.4. Test Options

Parameter
Iterations Sets the number of times to perform the file transfer.
Test Time Sets the duration to perform the transfers (minutes).
Transfer Direction Sets the transfer direction from the perspective of the client application.
Transfer Duration Sets the duration to transmit UDP packets (seconds).
FTP Optimization Enabled Enables or disables FTP optimization which limits the maximum transfer duration of an FTP transfer. (When enabled, The Data Integrity check will be disabled.)
Max Transfer Duration Specifies the maximum duration (seconds) that an FTP transfer will be allowed to run.
Download File Name Specifies the file to download. Files requested for download must be stored in the **"C:\Inetpub\ftproot\Spirent\APEX-FTP\Download"** directory on the application server.
Upload File Name Specifies the file to upload. Files requested for upload must be stored in 'C:\Program Files\Spirent Communications\Spirent Data Client\Upload Files' on the client laptop.
Voice Call Options Sets the Voice Call Related Parameters. **Voice Call Options → Call Enabled** Enables/disables the Simultaneous Voice Call. **Voice Call Options → Call Direction** Set the Mode of Voice Call. **Voice Call Options → Call Duration** Set the Duration of Voice Call. **Voice Call Options → Delay Between Calls** Set the Delay Between two Voice Calls.
Execution Limit Determines if the test will perform a specified number of iterations or repeat for a specified duration.
Latency Measurement Sets the latency measurement type.
Initiation Set the initiation of the connection.

Parameter
Ping Direction Sets the ping direction from the perspective of the client application.
Packet Size Sets the size of the ping packet to transmit during the test (bytes).

4.4.5. Test Criteria

Parameter
Advanced Criteria Enabled • Enable/Disable the advanced criteria for multiple UE categories
Cat 1 Required Downlink Throughput • Set the downlink throughput criteria for UE Category 1
Cat 2 Required Downlink Throughput • Set the downlink throughput criteria for UE Category 2
Cat 3 Required Downlink Throughput • Set the downlink throughput criteria for UE Category 3
Cat 4 Required Downlink Throughput • Set the downlink throughput criteria for UE Category 4
Cat 5 Required Downlink Throughput • Set the downlink throughput criteria for UE Category 5
Cat 1 Required Uplink Throughput • Set the uplink throughput criteria for UE Category 1
Cat 2 Required Uplink Throughput • Set the uplink throughput criteria for UE Category 2
Cat 3 Required Uplink Throughput • Set the uplink throughput criteria for UE Category 3
Cat 4 Required Uplink Throughput • Set the uplink throughput criteria for UE Category 4
Cat 5 Required Uplink Throughput • Set the uplink throughput criteria for UE Category 5
Maximum Connect Time • Defines the maximum connect time to pass the test (ms).
Maximum Attach Time • Defines the maximum attach time to pass the test (ms).
Maximum Delay • Defines the maximum delay to pass the test (ms).
Maximum Timeouts • Defines the maximum number of timeouts allowed to pass the test.

4.4.6. Logging Options

Parameter
CQI Stats Enabled Enables/disables the CQI Statistics.
RLC Layer Stats Enabled Enables/disables the RLC Layer Statistics.

4.4.7. Advanced Options

Parameter
Uplink Socket Buffer Size Sets the Socket Buffer Size for Uplink.
Downlink Socket Buffer Size Sets the Socket Buffer Size for Downlink.
IPv4 UDP Packet Size Sets UDP packet size for IPv4.
IPv6 UDP Packet Size Sets UDP packet size for IPv6.