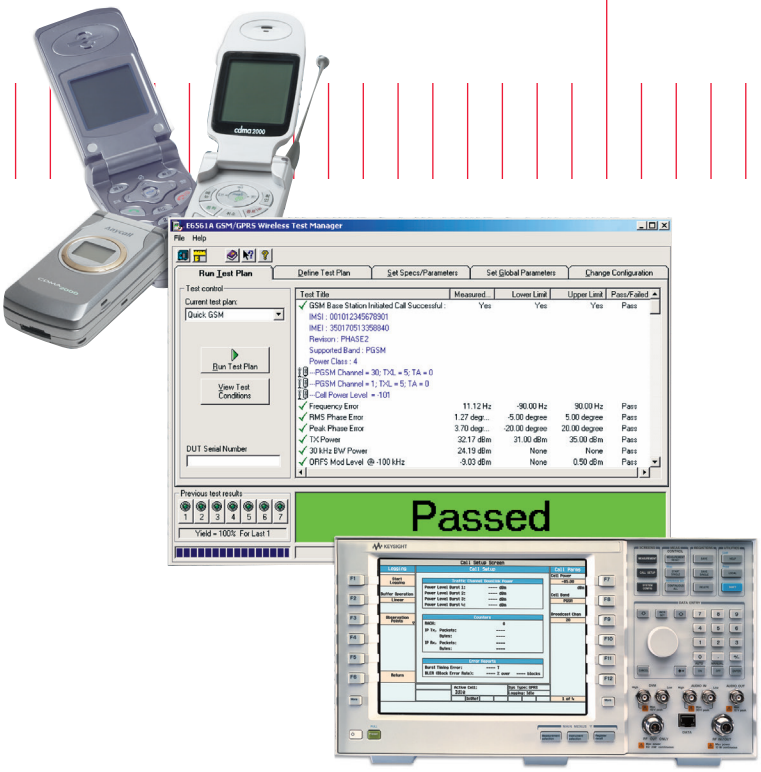
Keysight Technologies
GSM/W-CDMA SMS Testing with Wireless Test Managers (WTMs)

Application Note



KEYSIGHT TECHNOLOGIES

Introduction

Two Quick Fixed Engineerings (QFEs) for the Keysight Technologies, Inc. Wireless Test Managers (WTMs) can be used to automate GSM/W-CDMA Short Message Service (SMS) testing with the Keysight E5515C Wireless Communications Test Set. This application note explains how to install these QFEs and how to implement GSM or W-CDMA SMS test with WTM.

This application note is only applicable for the E6566C C.02.00 and E6568C C.02.00 with development mode. The SMS testing capability is limited in point-to-point test short message service which is available on both the GSM/GPRS and W-CDMA test applications and lab applications for the E5515C. Microsoft Visual Studio .NET 2003 or 2005 is also required.

For more information on SMS capabilities on the 8960 (E5515C) and related WTM products, please refer to the table below.

	TA	LA	WTM
GSM	E1968A E1987A	E6701D or above E6785D or above	E6566C/E6568C
W-CDMA	E1963A E1987A	E6703C or above E6785C or above	E6568C

The E6566C C.02.00 QFE and E6568C C.02.00 QFE can be downloaded from the following link:
http://wireless.keysight.com/rfcomms/dloads/wtm

Installation

Caution: Currently both of the QFEs are based on the development versions of WTM. The run-time WTM versions do not support the SMS test steps.

Caution: If customizations have been made to the original WTM version (E6566C 2.0 or E6568C 2.0), please backup the source codes prior to installing the corresponding QFE. The customized code may be over-written or eliminated during the update process.

1. Verify the WTM version (E6566C 2.0 or E6568C 2.0) installed on the PC.
   a. Open the E6566C or E6568C run-time program.
   b. Click on ***Help>About***. A message window with the WTM application version information will appear. Refer to Figure 1.

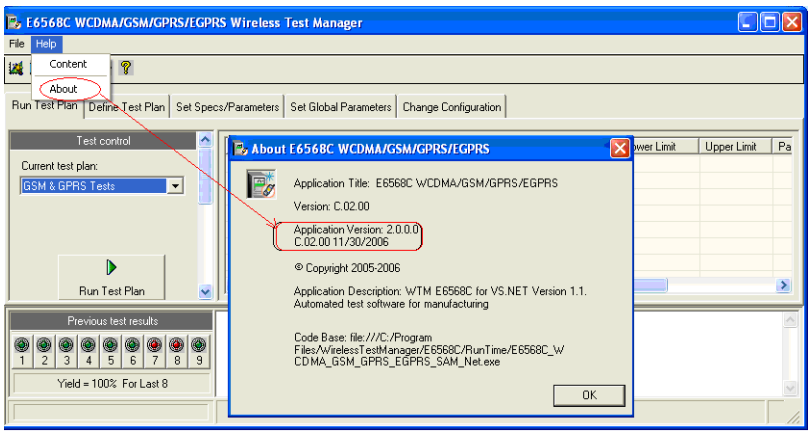


Figure 1. WTM version information.

Note: If the version on your PC is not correct, the QFE installation process will not be completed.

2. Install the QFE
3. Double click the QFE installation program (E6566C C.02.00 QFE2.exe or E6568C C.02.00 QFE2.exe) to initiate the installation process. Follow the InstallShield Wizard to complete the installation. See Figures 2 to 4.

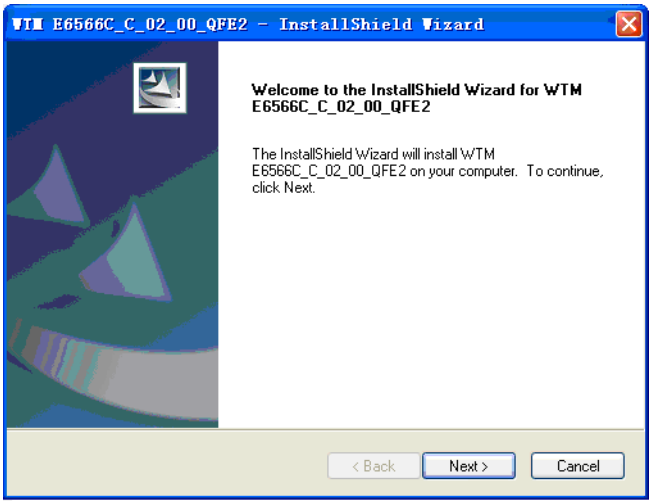


Figure 2. Start the InstallShield.

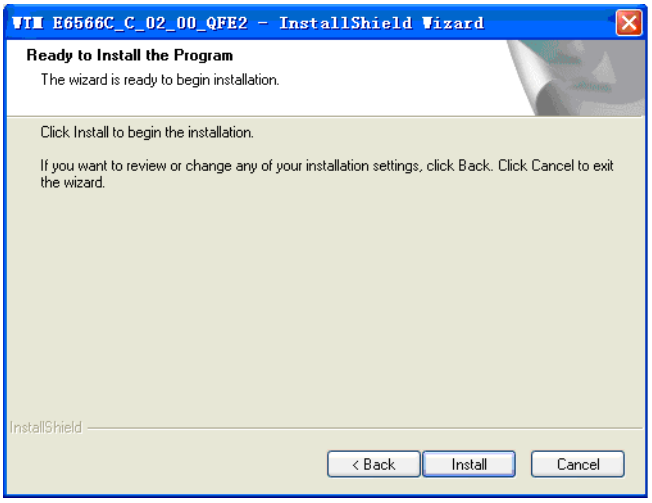


Figure 3. Begin the installation.

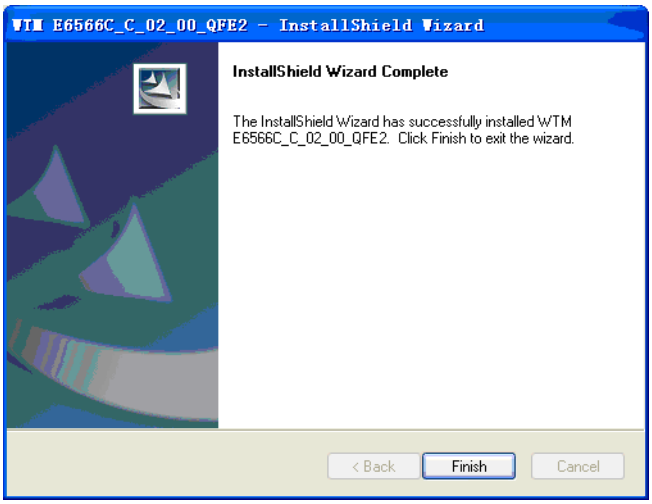


Figure 4. Installation completed.

4. Database alignment
   a. Open the WTM project ("Project For E6566C GSM GPRS EGPRS" or "Project For E6568C WCDMA GSM GPRS EGPRS") in the Visual Studio .NET.
   b. Click on the ***Keysight WTM Add Wireless Test*** button, the Add Wireless Test Wizard window will open. Choose the ***Align database test code>Next*** and go through the wizard. See Figure 5.

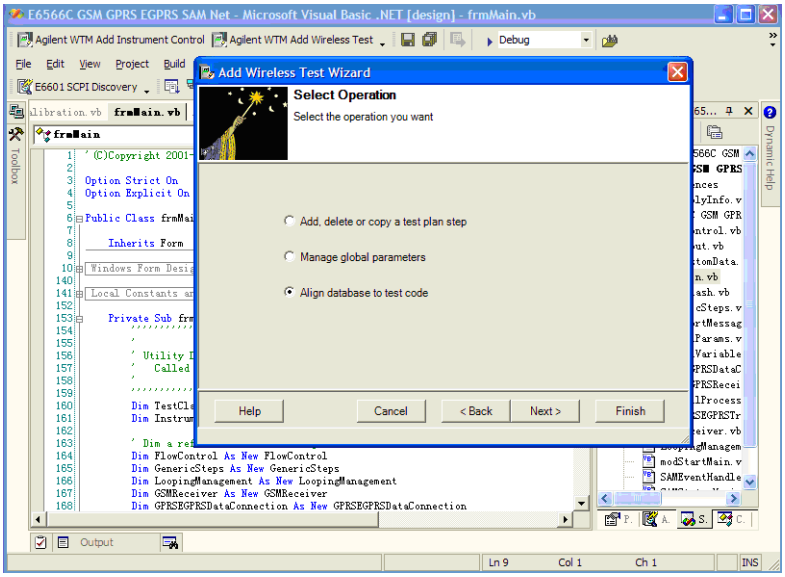


Figure 5. Add Wireless Test Wizard.

5. Rebuild the Visual Studio .NET project. A new run-time application will be generated and the old one will be replaced automatically.

SMS Testing

There are four SMS-related test steps in these two QFEs.

1. GSM/GPRS/EGPRS SMS mobile terminated
2. GSM/GPRS/EGPRS SMS mobile originated
3. W-CDMA SMS mobile terminated
4. W-CDMA SMS mobile originated

In this section, we will introduce how to set parameters for each test step, and how to create a test plan for SMS testing.

Parameter setting

There are several parameters for each test step. How to set these parameters depends on what kind of tests you are performing. Below are definitions for each parameter.

1. W-CDMA SMS mobile terminated
   a. Transportation
      Choose the domain in which the SMS messages are sent.
      Default value:
      CS domain
      Value range:
      CS domain / PS domain

   b. Content
      Choose or create the message content to be sent to the mobile station.
      Default value:
      Text1
      Value range:
      Text1 / Text2 / Custom Text / Custom Test File:
      Text1
      "01234567890ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklm nopqrstuvwxyz"
      Text2
      "Keysight Technologies, your partner in wireless solutions."
      Customer text
      The text sent in the SMS message is customized in the "Custom Text" parameter
      Customer text file
      The text sent in the SMS message is customized in the specific .txt file, which can be found in the "TestData" file under the WTMS's installation directory. For example: C:\Program Files\Keysight\WirelessTestManager\E6568C\TestData

   c. Custom text
      Customize the SMS message content that will be sent when the "Content" parameter is set to ***Customer Text***
      Default Value:
      "Enter your text here"
      Value range:
      7 bit ACSII characters up to 160 characters

      Note: The maximum length of the custom text is 50 characters. To send more than 50 characters, please edit the custom text file under the "testdata" folder.

d. User input for pass/fail
Define the way by which this step is determined to pass or fail. If ***Yes*** is selected, users have to decide the Pass/Fail manually using the following form. If ***No*** is selected, the result is decided automatically. See Figure 6.

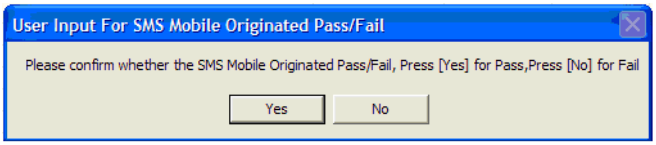


Figure 6. User input for SMS mobile Originated Pass/Fail message box

Default value:
No
Value range:
Yes / No

e. Timeout of 8960 sending SMS
Default value:
10
Value range:
0 to 60

f. Wait for MT SMS setup to compete
Specify how long to wait (in milliseconds) for all MT SMS setup parameters to be set to instrument
Default value:
0
Value range:
0 to 10000

2. W-CDMA SMS mobile originated
a. Loopback
If this parameter is set to ***Yes***, the test set will loop back the message it receives from the mobile station. If set to ***No***, the test set only receives what the mobile station sends.
Default value:
Off
Value range:
On / Off

b. Timeout of 8960 receiving SMS
Default value:
10
Value range:
0 to 10000

c. User input for pass fail
Same as the equivalent in the W-CDMA SMS mobile terminated step
Default value:
No
Value range:
Yes / No

d. Operator interaction required
   Specify whether or not operator interaction is required when WTM requires an action from the DUT. When this parameter is set to ***Yes***, a message is displayed to the user to perform the desired action. When set to ***No***, the "Data Connection DUT Commands with Specs" table is used to define the serial commands to send to the DUT for the desired action.
   Default value:
   Yes
   Value range:
   Yes / No

e. DUT timeout for received command
   Specify the amount of time to wait during a "Receive from DUT" action for the information to be returned on the serial connection
   Default value:
   2
   Value range:
   0 to 60

f. Send SMS DUT command with specs
   Refer to "GSM BS Initiated Call DUT Commands with Specs" in the "GSM Base Station Initiated Call" step
   Default Value:
   None
   Value range:
   None

g. Wait for MO SMS setup to complete
   Specify how long to wait (in milliseconds) for all MO SMS setup parameters to be set to instrument
   Default value:
   0
   Value range:
   0 to 10000

3. GSM/GPRS/EGPRS SMS mobile terminated
   a. GGE transportation
      Define the protocol layer via which the point-to-point SMS message is sent
      Default value:
      GSM
      Value range:
      GSM / GPRS

   b. Content
      Same as the equivalent in the W-CDMA SMS mobile terminated step
      Default value:
      Text1
      Value range:
      Text1 / Text2 / Custom Text / Custom Text File

c. Custom text
   Same as the equivalent in the W-CDMA SMS mobile terminated step
   Default value:
   “Enter your text here”
   Value range:
   7 bit ACSII characters up to 160 characters

d. User input for pass/fail
   Same as the equivalent in the W-CDMA SMS mobile terminated step
   Default value:
   No
   Value range:
   Yes / No

e. Timeout of 8960 sending SMS
   Default value:
   10
   Value range:
   0 to 60

f. Wait for MT SMS setup to complete
   Same as the equivalent in the W-CDMA SMS mobile terminated step
   Default value:
   0
   Value range:
   0 to 10000

4. GSM GPRS EGPRS SMS mobile originated
   a. Loopback
      Same as the equivalent in the W-CDMA SMS mobile originated step
      Default value:
      On
      Value range:
      On / Off

   b. Timeout of 8960 receiving SMS
      Default value:
      10
      Value range:
      0 to 10000

   c. User input for pass/fail
      Same as the equivalent in the W-CDMA SMS mobile terminated step
      Default value:
      No
      Value range:
      Yes / No

   d. Operator interaction required
      Same as the equivalent in the W-CDMA SMS mobile originated step
      Default value:
      Yes
      Value range:
      Yes / No

e. DUT timeout for received command
   Same as the equivalent in the W-CDMA SMS mobile originated step
   Default value:
   2
   Value range:
   0 to 60

f. Send SMS DUT command with specs
   Same as the equivalent in the W-CDMA SMS mobile originated step
   Default value:
   None
   Value range:
   None

g. Wait for MO SMS setup to complete
   Same as the equivalent in the W-CDMA SMS mobile originated step
   Default value:
   0
   Value range:
   0 to 10000

   Note: Supports 160 SMS characters, including MT and MO. If user wants to send more than 160 SMS characters in MO, the "User Input for Pass/Fail" must be set to ***Yes***, which means the pass/fail must be indicated "manual."

Create SMS Test Plan

These new SMS test steps provide the capability to test DUT SMS functionality. Examples of typical test plans are provided.

1. GSM plans
   a. Test plan I
      This test plan can be used to check the SMS ability of the DUT within the GSM transportation
      Step 1:
      GSM base station initiated call
      Step 2:
      GSM end call
      Step 3:
      GSM/GPRS/EGPRS SMS mobile terminated or GSM/GPRS/EGPRS SMS mobile originated

   b. Test plan II
      The following plan can be used to check the SMS ability of the DUT over the voice call connection within GSM transportation
      Step 1:
      GSM base station initiated call
      Step 2:
      GSM/GPRS/EGPRS SMS mobile terminated or GSM/GPRS/EGPRS SMS mobile originated
      Step 3:
      GSM end call

2. GPRS plan
   This test plan can be used to check the SMS ability of the DUT within the GPRS transportation. The first and second are steps to ensure that the connection status is “Attached” between the DUT and the E5515C test set
   Step 1:
   GPRS start data connection
   Step 2:
   GPRS end data connection
   Step 3:
   GSM/GPRS/EGPRS SMS mobile terminated or GSM/GPRS/EGPRS SMS mobile originated

3. W-CDMA CS domain plan
   a. Test plan I
      This test plan can be used to check the W-CDMA SMS ability of the DUT over an existing connection in the CS domain
      Step 1:
      W-CDMA origination
      Step 2:
      W-CDMA SMS mobile terminated or W-CDMA SMS mobile origination
      Step 3:
      W-CDMA base station release

   b. Test plan II
      This test plan can be used to check the W-CDMA SMS ability of the DUT in the CS domain
      Step 1:
      W-CDMA registration ("Registration PS Domain Information" should be set to ***Info Absent*** and "Registration IMSI Attach Flag" should be set to ***Set***)
      Step 2:
      W-CDMA SMS mobile terminated or W-CDMA SMS mobile origination

4. W-CDMA PS domain plan
   This test plan can be used to check the W-CDMA SMS ability of the DUT in the PS domain
   Step 1:
   W-CDMA registration ("Registration PS Domain Information" should be set to ***Info Present*** and "Registration IMSI Attach Flag" should be set to ***Set***)
   Step 2:
   W-CDMA SMS mobile terminated or W-CDMA SMS mobile origination

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