QUALCOMM®
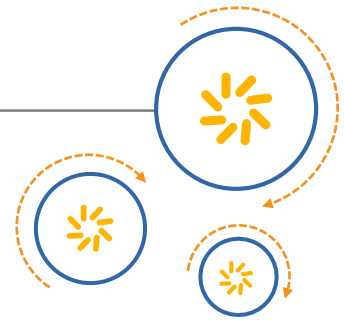
Qualcomm Technologies, Inc.

Configuring a UE Using Modem Configuration Files

Application Note

80-NP686-1 Rev. C

October 30, 2014

Revision history

Revision	Date	Description
A	Jun 2014	Initial release
B	Jun 2014	Added procedure for loading and activating MBN using UI
C	Oct 2014	Changed title from Configuring a UE Using Binary Modem Configuration to Configuring a UE Using Modem Configuration Files Numerous other changes were made to the document

Contents

Figures

Tables

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1 Introduction

1.1 Purpose

This document describes the procedures to load and activate modem configuration files, also known as MBN files, on the User Equipment (UE). It describes how to use QPST and UI applications to complete these tasks.

1.2 Conventions

Button and key names appear in bold font, e.g., click **Save** or press **Enter**.

1.3 References

Reference documents are listed in Table 1-1.

Table 1-1 Reference documents and standards

Ref.	Document	
Qualcomm Technologies, Inc.		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Q2	*Presentation: Modem Software Configuration*	80-N5576-96
Q3	*Presentation: USB UICC Overview*	80-NN611-1
Q4	*UIM Driver Configurable Items*	80-NE596-2

1.4 Technical assistance

For assistance or clarification on information in this document, submit a case to Qualcomm Technologies, Inc. (QTI) at https://support.cdmatech.com/.

If you do not have access to the CDMATech Support website, register for access or send email to support.cdmatech@qti.qualcomm.com.

1.5 Acronyms

For definitions of terms and abbreviations, see [Q1].

2 General Information About MBNs

2.1 MBN files

MBN files are mcfg.mbn files. They are essentially a set of critical NV/EFS and policy manager settings that properly configure the UE to meet the operational requirements of a carrier's network. MBNs are also used to configure the UE to comply with lab testing and certification requirements.

OEMs use QPST or applications on the UE to load MBNs on the UE, to activate an MBN, and to switch between MBNs. See Chapter 3 for more information on the tools and tasks used to configure the UE.

2.2 MBN types

There are two MBN types. Table 2-1 provides a brief description of each MBN type.

Table 2-1 Description of MBN types

MBN type	Purpose and details
Hardware (HW) MBN	▪ Prepares the UE for accepting a SW MBN ▪ Must load HW MBN to the UE before loading the SW MBNs ▪ There are separate HW MBNs for single-SIM devices and for dual-SIM devices
Software (SW) MBN	▪ Configures the UE to comply with lab testing and certification requirements ▪ Contains the necessary NV/EFS configuration for proper operation of the UE ▪ There are separate SW MBNs for single-SIM devices and for dual-SIM devices ▪ There are separate SW MBNs for each UE variant

2.2.1 Hardware MBN

The hardware MBN file is in the MPSS build at `<MODEM BUILD PATH>\ modem_proc\mcfg\configs\mcfg_hw\generic\common\`. This path is referred to as the `<hwmbnpath>`.

Table 2-2 shows the appropriate hardware MBN to load based on the SIM configuration of the device. Qualcomm recommends that you use QPST to load the hardware MBN. For instructions on how to load MBN files using QPST, see Section 3.1.

Table 2-2 Hardware MBN subfolder location and file example

Chipset	SIM support	Location/MBN name*
MSM8916	Single-SIM	`<hwmbnpath>\MTP8916_SingleSim\mcfg_hw.mbn`
MSM8916	Dual-SIM	`<hwmbnpath>\MTP8916_DualSim\mcfg_hw.mbn`

*For other chipsets, the subfolder is similar, but the chipset name is different.

NOTE: Modifications to the hardware MBN might be necessary to match the specific hardware design. The hardware MBN contains NV 70210, which configures many GPIO mappings. Verify that it is set correctly to match the specific hardware. For more information on NV 70210, see [Q3] and [Q4].

2.2.2 Software MBNs
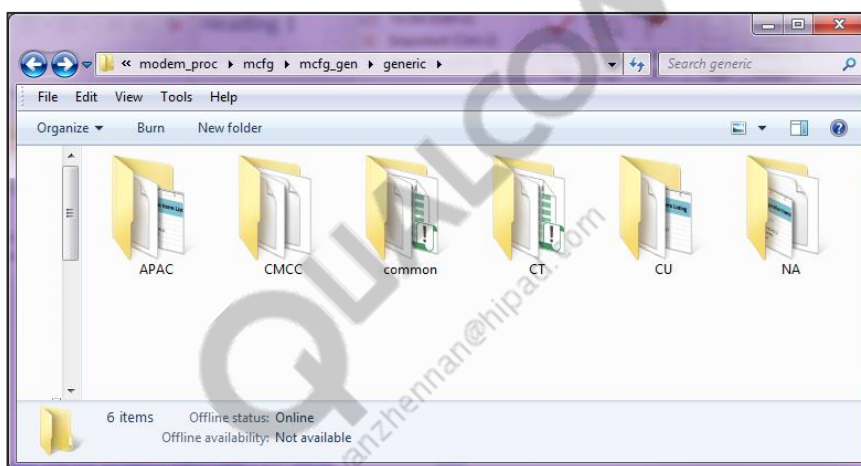
Figure 2-1 Location of software MBNs

The location of the software MBNs depends on the type of release (AMSS or QMSS).

For AMSS releases, the default software MBNs are at `<MODEM_BUILD>\modem_proc\mcfg\configs\mcfg_sw\generic`. This path is referred to as the `<swmbnpath>`. There are directories in this path that organize the MBNs by geographic region or by carrier. Table 2-3 identifies the appropriate subdirectory for each carrier or region.

Table 2-3 MBN subdirectories by carrier and region

Carrier or region	Subdirectory containing the MBNs
Asia-Pacific carriers like Airtel, DCM (DOCOMO), KDDI, Reliance, and SBM (Softbank)	`<swmbnpath>\APAC`
Common (carrier W-One)	`<swmbnpath>\common`
China Mobile	`<swmbnpath>\CMCC`
China Telecom	`<swmbnpath>\CT`
China Unicom	`<swmbnpath>\CU`
North America carriers like Verizon Wireless, AT&T, Sprint, and T-Mobile	`<swmbnpath>\NA`

For QMSS releases, the default software MBNs are built in the Android partition of the UE. They are also available at the `<swmbnpath>` as described for the AMSS releases.

3 Methods/Tools to Configure UE

The primary tasks to configure the UE are:

1. Load an MBN or multiple MBNs.
2. Activate an MBN.
3. Switch between loaded MBNs.

The tools you use to perform these tasks depends on the type of release.

- AMSS customers must use QPST for all three tasks.
- QMSS customers can use either QPST or the UI applications to perform all of the required tasks.

Where available, the UI applications are the recommended method to use during testing because they enable faster switching between MBNs. QPST is recommended for factory use, but can be used during testing as well. QPST is the only option for AMSS releases.
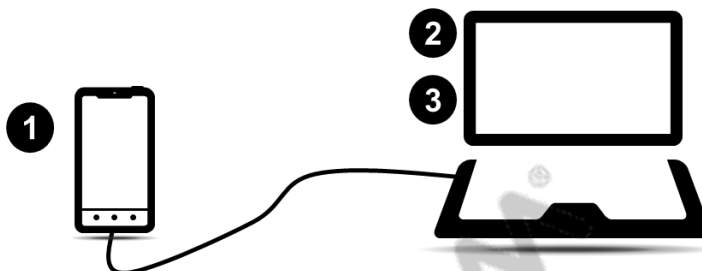
The remainder of this chapter describes how to use QPST and the UI applications to load, activate, and switch between MBNs.

See Section 3.1 for information on using QPST.

See Section 3.2 for information on using the UI applications.

3.1 Using QPST

Setup and prerequisites

1	UE is connected to a PC.
2	PC is running QPST version 2.7.421 or later.
3	Know your `<MODEM_BUILD>` path and be able to access it from the PC.

NOTE: If you disabled the RmNet port on the UE, ensure that it is enabled before performing these steps.

3.1.1 Loading and activating MBNs

1. Open the QPST Software Download module on the PC.

2. Click the MCFG-PDC tab on the far right of the application.

3. Click the drop-down arrow and select any RmNet port available from the device.

4. Click **Load**. A pop-up window appears.

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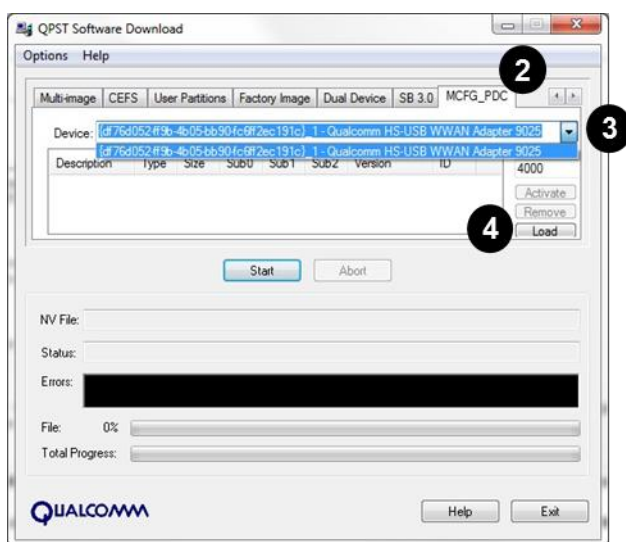
5. Use Windows Explorer to navigate to
   `<MODEM_BUILD>\modem_proc\mcfg\configs\mcfg_sw\generic`. This path is known as
   the `<swmbnpath>`.
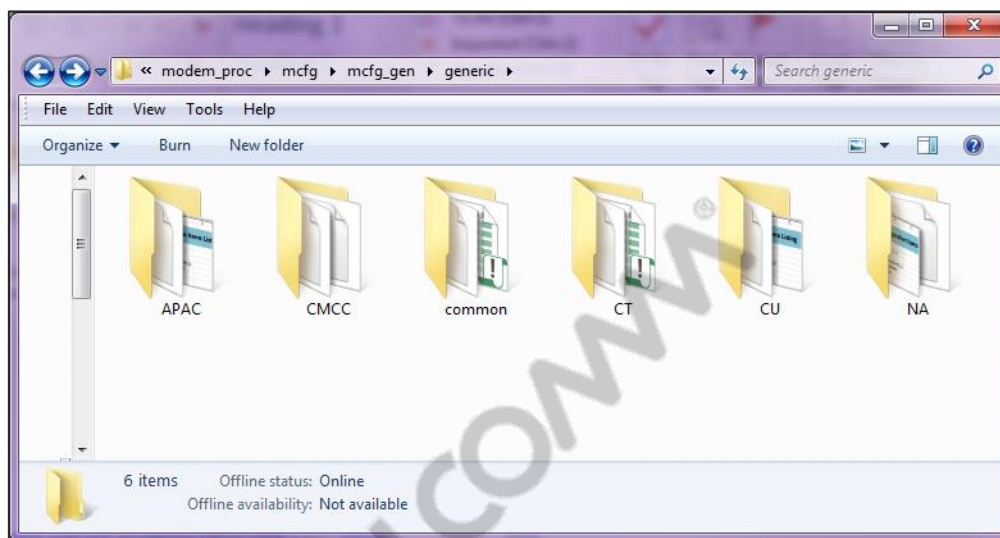
There are directories in this path that organize the MBNs by geographic region or by carrier.
Table 3-4 identifies the appropriate subdirectory for each carrier or region.

Table 3-4 MBN subdirectories by carrier and region

Carrier or region	Subdirectory containing the MBNs
Asia-Pacific carriers like Airtel, DCM (DOCOMO), KDDI, Reliance, and SBM (Softbank))	`<swmbnpath>\APAC`
Common	`<swmbnpath>\common`
China Mobile	`<swmbnpath>\CMCC`
China Telecom	`<swmbnpath>\CT`
China Unicom	`<swmbnpath>\CU`
North America carriers like Verizon Wireless, AT&T, Sprint, and T-Mobile)	`<swmbnpath>\NA`

6. In Explorer, open the directory for the appropriate carrier or region.

7. Copy the full path of the applicable directory then paste it in the QPST pop-up.

8. Click **Open**.

9. Double-click the `mcfg_sw.mbn` file. The file is now listed in QPST.

10. Repeat steps 6 through 9 until all of the MBNs applicable to the UE are loaded.
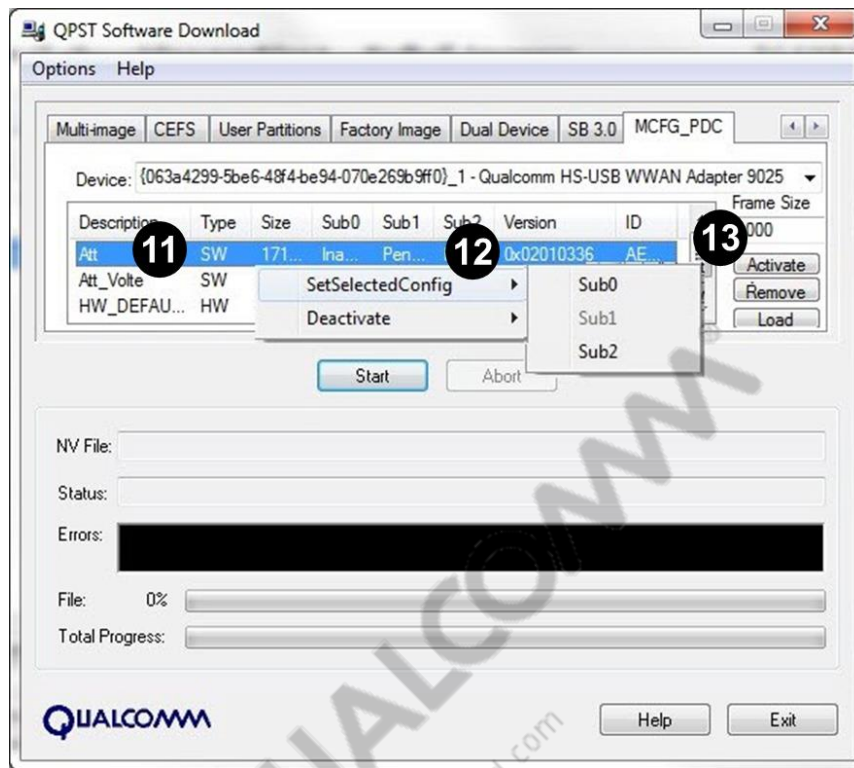
11. Highlight and right-click the MBN that is appropriate for the UE that you are configuring.

12. Select SetSelectedConfig from the pop-up menu and then do one of the following:

     □   If the UE is a single-SIM device, select Sub0.

     □   If the UE is a dual-SIM device, select Sub0 then repeat steps 10 and 11 and select Sub1.

         The configuration state changes to Pending after the selection.

13. Click **Activate**. The device resets. In some cases, a crash dump occurs.

14. Turn off, then turn on the device. The selected configuration is now active on the UE.

3.1.2 Switching between MBNs

To switch between MBNs using QPST, do the following:

1. Deactivate the currently active MBN. See Deactivating an MBN for more information.

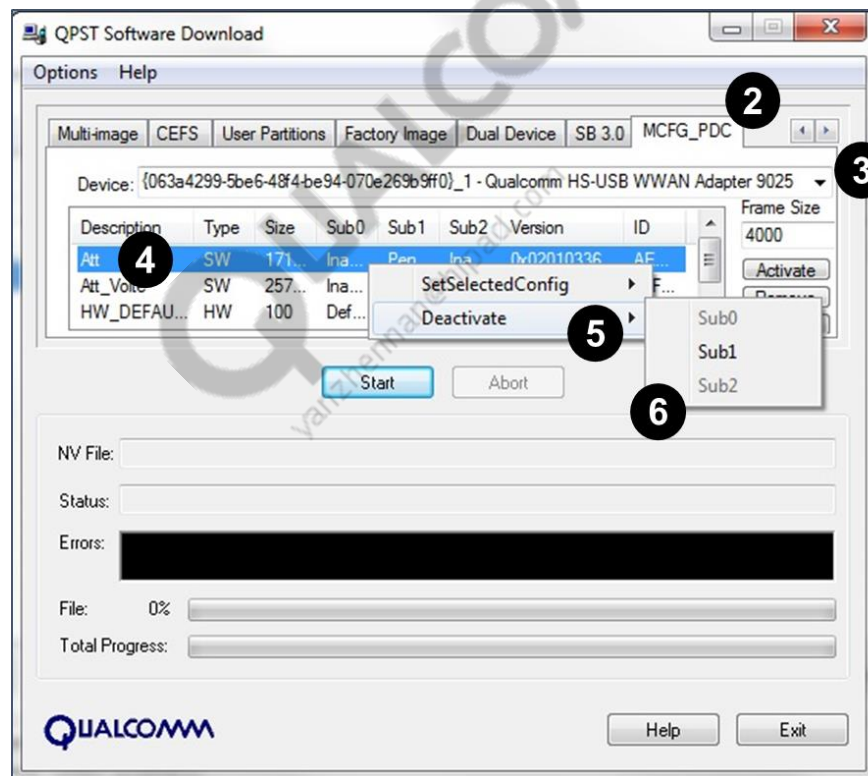2. Load and activate the new MBN. See Section 3.1.1 for more information.

Deactivating an MBN

When you deactivate an MBN, the NV/EFS settings are rolled back to their prior state for the specified subscription. The inactive MBN remains on the UE and is available for reactivation.

Steps for deactivating an MBN using QPST

To deactivate an MBN, do the following:

1. Open the QPST Software Download module on the PC.

2. Click the MCFG-PDC tab on the far right of the application.

3. Click the drop-down arrow and select any RmNet port available from the UE.

4. Highlight and right-click the MBN that you want to deactivate.

5. Select Deactivate. A list of subscriptions appears.

6. Do one of the following:

   □ If the UE is a single-SIM device, select Sub0.

   □ If the UE is a dual-SIM device, select Sub0, then repeat steps 4 and 5 and select Sub1.

   The status of the MBN changes to Inactive.

3.1.3 Deleting an MBN from the UE

NOTE: Only MBNs in pending or inactive status can be deleted from the UE.

To delete an MBN from the Flash memory of the UE, do the following:

1. Open the QPST Software Download module on the PC.

2. Click the MCFG-PDC tab on the far right of the application.

3. Select an inactive/pending configuration and click **Remove**. This removes the MBN from the Flash memory of the UE.

3.2 Using UI applications

There are three UI applications involved in loading and activating MBNs. Use the applications in the following sequence:
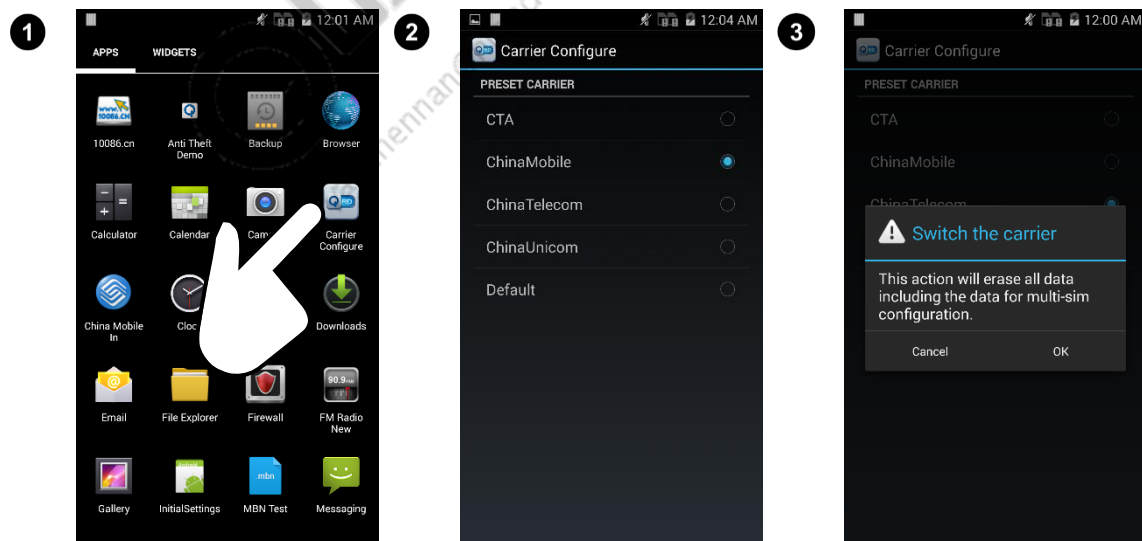
1. Use the Carrier Configure application to select the carrier. See Section 3.2.1.

2. Use the Device Type Setting application to:

   □ Select the mode and SIM configurations.

   □ Load MBNs. See Section 3.2.2.

3. Use the MBN Test application to activate an MBN and to switch between MBNs loaded in the previous step. See Section 3.2.3.

This chapter describes the procedures for using each of the applications.

NOTE: UI applications for working with MBNs are only available for certain QMSS releases. All other releases must use QPST to load, activate, and switch between MBNs.
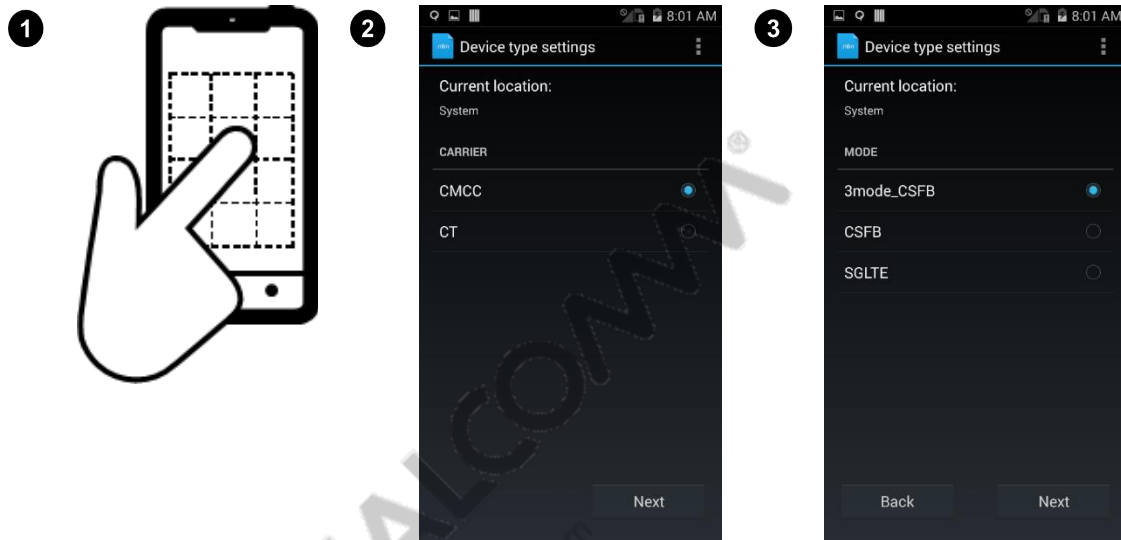
3.2.1 Carrier Configure application

Follow these steps to launch the Carrier Configure application and to the carrier.

1. Select the Carrier Configure icon to launch the application. The PRESET CARRIER screen appears.

2. Select the carrier for whom you are configuring the device.

3. Tap **OK**. The device reboots. Continue to the next section.

3.2.2 Device Type Setting application

Follow these steps to launch the Device Type Setting application and to configure the device with the appropriate settings.

1. Type ***#*# 6266344#*#*** in the keypad to launch the Device type setting application. The UI for the Device Type Setting application automatically appears.

2. Select the same carrier that you selected with the Carrier Configure application, then tap **Next**.

3. Select the device mode, then tap **Next**.
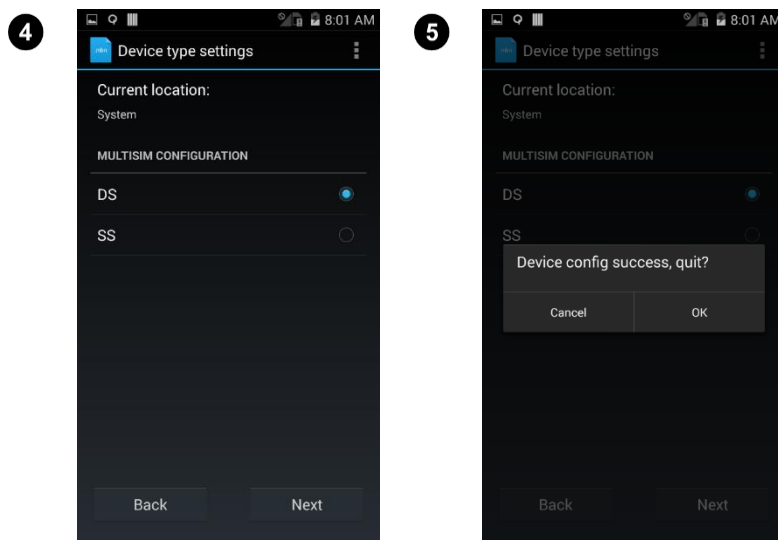
4. Choose the SIM configuration, then tap **Next** (DS is for dual-SIM and SS is for single-SIM).

5. Tap **OK** to confirm the device configuration.

3.2.3 MBN Test application

The MBN Test application provides an easy-to-use UI for activating MBNs. MBN Test is the recommended method to use during testing because it enables faster switching between configurations. QPST is also used to activate the MBNs and is the preferred method for factory use. For more information on using QPST to load and activate MBNs, see Section 3.1.


To use the MBN Test application to activate an MBN, do the following:

1. Type ***#*# 76266344#*#*** in the keypad to install the MBN Test application. The MBN Test application icon appears in the device UI.

2. Tap the MBN Test application icon.

    The MBN Test screen appears and displays the following information:

    □   Activated config: the current activated MBN

    □   Carrier name: the carrier selected from the Device type setting application

    □   Device type: the mode and multiSIM configuration selected from the Device type setting application

    □   List of MBNs loaded on the device

3. Select an MBN from the CHOOSE CONFIG section of the UI, then tap **Activate**.
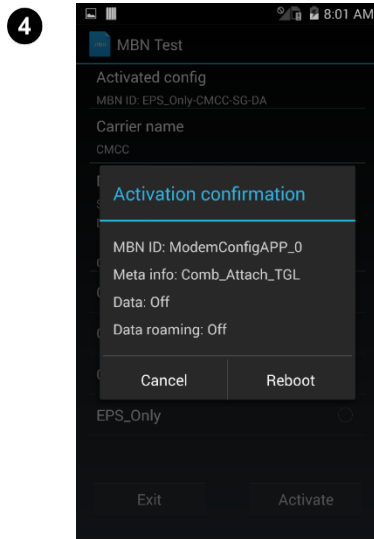
4. Tap **Reboot**. The device reboots and the selected MBN is now active.

Removing the MBN Test application

When you remove the MBN Test application, you remove the icon from the device UI so that end users cannot access the application. Remove the application before providing the device to end users that should not have permissions to change configurations. Reinstall the application by following the procedures in the previous section.

NOTE: Do not remove the application from devices that you are submitting to carriers for PA testing.

To remove the MBN Test application, type ***#*#33266344#*#*** in the keypad. The MBN Test application icon disappears from the device UI.

A Working with Multiple Subscriptions for Different Carriers

If a use case requires the UE to support two carriers or networks, use QPST and follow the procedure in this Appendix.

Setup and prerequisites
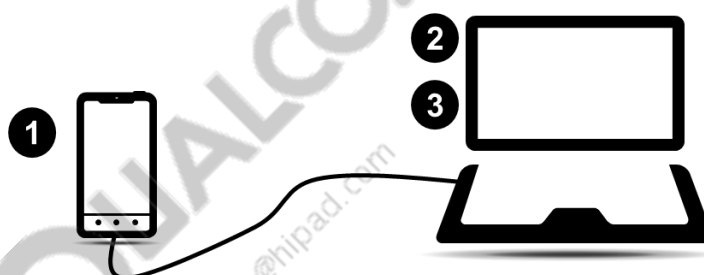
1	UE is connected to a PC.
2	PC is running QPST version 2.7.421 or later.
3	Know your `<MODEM_BUILD>` path and be able to access it from the PC.

NOTE: If you disabled the RmNet port on the UE, ensure that it is enabled before performing these steps.

Procedure

1. Open the QPST Software Download module on the PC.
2. Load the dual-SIM MBNs for both carriers to the UE as described in Section 3.1.1.
3. Do one of the following:
   - If there are no MBNs currently active on the UE, see step 4.
   - If there are active MBNs on the UE, deactivate the MBNs as described in Section 3.1.2.
4. Highlight and right-click the MBN for one of the carriers.
5. Select SetSelectedConfig from the pop-up menu and select Sub0.
6. Highlight and right-click the MBN for the other carrier.
7. Select SetSelectedConfig from the pop-up menu and select Sub1.

8. Click **Activate**. The device resets. In some cases, a crash dump occurs.

9. Turn off, then turn on the device. The selected configurations are now active on the UE.

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