



QUALCOMM[®] Product Support Tool (QPST[™]) 2.7

User Guide

80-V1400-3 J

March 27, 2006

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1 Introduction

1.1 Purpose

This guide describes how to use the component applications of the QUALCOMM® Product Support Tool (QPST™) software.

1.2 Scope

This user guide is written for technicians, administrators, and other personnel who operate QPST. It assumes that you are familiar with:

- Basic CDMA technology
- Microsoft® Windows NT® 4.0, Windows 2000, or Windows XP®

If you are installing QPST on Windows NT 4.0, Windows 2000, or Windows XP, you must have Administrator access to the workstation on which QPST is to be installed; contact your own computer support organization if you need this type of access granted.

1.3 Conventions

The following conventions are used in this guide:

- Button names appear in a bold font, e.g., Click **Browse**.
- Key names appear in a different font, e.g., Press ENTER.
- Shading indicates content that has been added or changed for this revision of the document.

1.4 Revision history

This guide is revised periodically to maintain consistency with the current system hardware and software releases, describe/update operational enhancements, and incorporate customer suggestions.

The revision history for this document is shown in Table 1-1.

Table 1-1 Revision history

DCN	Date	Description
80-V0893-1 Rev. –	Jan 2000	Initial release of QCTest Suite, Version 2.2
80-V0893-2 Rev. –	Jan 2000	Updated to reflect changes incorporated in Version 2.3
80-V1249-1 Rev. –	Mar 2000	Updated to reflect changes incorporated in Version 2.4; reformatted for QUALCOMM CDMA Technologies licensees
80-V1249-6 Rev. –	Jun 2000	Updated to reflect removal of copy protection key; DCN number updated to match build number
80-V1400-1 X1	Jul 2000	■ Changed name of product to QPST from QCTest Suite ■ Updated text and screen shots to reflect name change ■ Changed DCN because of name change and revision handling ■ Added Roaming List Editor information (Chapter 8) ■ Updated to reflect other software changes in Version 2.5
80-V1400-1 X2	Sep 2000	Added CDMA-2 and Broadcast SMS tab information to the Service Programming section
80-V1400-2 X1	Dec 2000	Documentation is for Version 2.6. Software changes have been made at a detailed level, which do not affect the document's contents for this revision.
80-V1400-2 X1	Mar 2001	Updated to reflect changes incorporated in Version 2.7 by adding models to hardware requirements table
80-V1400-2 X2	Apr 2001	Updated for MSP-1000 Software Download support
80-V1400-3 X3	Oct 2001	Updated list of supported models; added explanations of MM Audio, gpsOne, M.IP, and NAS tabs to Service Programming; updated Roaming List Editor to support 683A+1xEV
80-V1400-3 Rev. A	Mar 2002	MSP-1000 is no longer supported. Updated Chapters 5 and 8; revision numbering system has been changed for internal tracking purposes only
80-V1400-3 Rev. B	Mar 2003	Editorial updates
80-V1400-3 Rev. C	Dec 2003	Added chapters on RF NV Manager GUI Application, FTM RF Evaluation GUI Application; revised Chapters 1, 2, 5, and 8
80-V1400-3 D	Mar 2004	Added chapter on QCNView; updated RF NV Manager GUI Application and FTM RF Evaluation GUI Application
80-V1400-3 E	May 2004	Updated RF NV Manager GUI Application and FTM RF Evaluation GUI Application
80-V1400-3 F	Jun 2004	Updated FTM RF Evaluation GUI Application
80-V1400-3 G	Feb 2005	Added Gang Flash Image Application
80-V1400-3 H	Apr 2005	Added Camera mode, PMIC, GSM BER, WCDMA BER, and CDMA RF Calibration
80-V1400-3 J	Mar 2006	Updated Gang Flash Image Application Note: There is no Rev. I per Mil. Standards.

1.5 References

Reference documents, which may include QUALCOMM, standards, and resource documents, are listed in Table 1-2. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.

Table 1-2 Reference documents and standards

Ref.	Document	
QUALCOMM		
Q1	Application Note: Software Glossary for Customers	CL93-V3077-1
Q2	Application Note: Factory Test Mode Logging API	80-V9147-1
Q3	Camera Services Interface Specification and Operational Description	80-V5310-1
Resources		
R1	Factory Test Mode CDMA 1x RF Commands Document	—
R2	Bluetooth V1.1 Specifications Book	—

1.6 Technical support

NOTE To quickly resolve any problems, have information available about the hardware, operating system, and version of QPST being installed.

Contact the following:

- For assistance or clarification on information in this document or information regarding CAIT, send email to the QUALCOMM Technology Support Group at qctest-support@qualcomm.com.
- For assistance or clarification on information specifically related to QCAT, QXDM, or QPST submit a Service Request to QUALCOMM CDMA Technologies at <https://support.cdmatech.com/>.

If you do not have access to Internet web browsing, you may send email to support.cdmatech@qualcomm.com.

1.7 Acronyms

The following terms are used throughout this document:

ADC	Analog-to-digital converter
AGC	Automatic gain control
AMSS	Advanced mode subscriber software
ASIC	Application-specific integrated circuit
Cal	Calibration
CD	Compact disk
CDMA	Code division multiple access
COM	Serial communication port (COM1, COM2, and so on)
CW	Continuous waveform
DAC	Digital-to-analog converter
DFM	Digital frequency modulation
DMSS	Dual-mode subscriber station
DVGA	Digital variable gain amplifier
ESN	Electronic serial number
FFA	Form-fit accurate, form factor accurate
FM	Frequency modulation
FM IQ	Frequency modulation Inphase and Quadrature
Freq	Frequency
FTM	Factory test mode
GPS	Global positioning system
GSM	Global system for mobile communications
GUI	Graphical user interface
HDET	High-power detector
IM2	Intermodulation 2
IMT	International mobile telephone
JCDMA	Japanese code division multiple access
LNA	Low noise amplifier
LUT	Look-up table
NV	Nonvolatile memory
PA	Power amplifier
PDM	Pulse density modulation
PLL	Phase-lock loop
PN	Pseudorandom noise
PRL	Preferred roaming list
QCT	QUALCOMM CDMA Technologies
QPST	QUALCOMM product support tool
RF	Radio frequency
RSSI	Receive signal strength indicator
Rx	Receive
SCM	Station class mark
SINAD	Signal-to-interface noise and distortion

SP	Standards proposal, signaling point, service providers
SPC	Service programming code, statistical process control
SURF	Subscriber unit reference platform
TRK LO	Tracking local oscillator
TSC	Training sequence
Tx	Transmit
UHF	Ultrahigh frequency
VCTCXO	Voltage-controlled, temperature-controlled oscillator
WCDMA	Wideband code division multiple access

2 Getting Started

This chapter provides information needed to install and run the QPST™ applications, including the operating system and hardware requirements. It also provides support for installing the phone hardware and security adapter used by QPST.

2.1 What is QPST?

QPST is a set of Windows tools designed to interface with, control, and test CDMA phones that contain QUALCOMM ASICs. The QPST server can keep track of multiple phones on local host machines.

QPST currently consists of the server application, which has no interface, and five component, or “client,” applications. Two standalone utilities, QCNView and Roaming List Editor, complete the QPST tool set.

The client applications include:

- QPST Configuration
- Service Programming
- Software Download
- RF NV Item Manager
- EFS Explorer

Table 2-1 describes the functions provided by each QPST client.

Table 2-1 QPST client applications

Client	Functions
QPST Configuration	■ Provides basic phone status display (MIN, ESN, model) ■ Allows phone control and monitoring
Service Programming	■ Saves service programming data to file ■ Allows the download of the same service programming file to multiple phones ■ Allows dialing plan, carrier information, and roaming list download
Software Download	■ Downloads software to QUALCOMM phones ■ Backs up and restores nonvolatile (NV) memory contents between downloads
RF NV Item Manager	■ Accesses a SURF™ phone's NV items that control RF usage
EFS Explorer	■ Allows navigation of the embedded file system (EFS) of phones that support it ■ Provides file-management capabilities

Table 2-2 describes the functions provided by the standalone utilities.

Table 2-2 QPST standalone utilities

Utility name	Function
QCNView	Formats QCN files created by the various clients
Roaming List Editor	Edits a phone's roaming protocol information

2.2 System requirements

Hardware and operating system requirements for QPST are outlined in the following sections.

2.2.1 Hardware

Table 2-3 describes the hardware items required to operate QPST. These items represent the minimum requirements for normal operation. If your hardware meets or exceeds these requirements, then no upgrade is necessary to use QPST.

Table 2-3 QPST hardware requirements

Item	Description
Computer	Desktop or laptop computer, 166 MHz Pentium with Layer 2 cache or better
RAM	32 MB or greater
Hard drive	Application requires 20 MB of available space
CD-ROM drive	For installing QPST
Video monitor	Minimum display resolution of 800x600
Serial communications	Free serial I/O (COM) ports for up to eight QPST-to-phone connections
QUALCOMM SURF or FFA phones	Mobiles based on the MSM3100™, MSM3300™, MSM5000™, MSM5100™, MSM5105™, MSM5500®, MSM6000™, MSM6025™, MSM6050™, MSM6100™, MSM6200™, MSM6250®, MSM6300®, or MSM6500® device
Data cables	Appropriate data cables for attaching each model of phone used with QPST to the computer's serial (COM) port

2.2.2 Operating system

The computer must be running Microsoft Windows NT 4.0 (with Service Pack 3 or later), Windows 2000, or Windows XP. It is advisable to run only those device drivers normally used by the operating system or mentioned in this guide. Otherwise, you may experience operating anomalies, conflicts, or random failures while using QPST.

2.3 Setting up QPST

QPST installation occurs in the following stages:

1. Setting up a laptop or desktop computer
2. Connecting phones to the computer
3. Installing the QPST software
4. Initial startup

This section contains the information needed for setting up and configuring QPST. For information about your computer or mobile phone, refer to the user guide provided for that product.

For more information or assistance during system setup, contact QUALCOMM Technical Support at support.cdmatech@qualcomm.com.

2.3.1 Setting up the computer

Before installing QPST, you must first set up the computer:

- Make sure the desktop or laptop computer is ready to power up and has either Windows NT 4.0, Windows 2000, or Windows XP operating system.
- If installing QPST on Windows NT, the system should be upgraded to Service Pack 3 or higher. Users installing on Windows NT, Windows 2000, or Windows XP must have Administrator privileges for the system. After QPST is installed, you can run it from any Windows NT/2000/XP user account.
- At least one available serial I/O port (COM 1 to 9) is required for connecting the test phone to the computer.
- The computer hard disk must have 20 MB of free space to store and run QPST. Additional space is recommended for storing backup and download files.

2.3.2 Connecting phones

The following sections describe how to connect a QUALCOMM phone to the QPST computer. You may need a 9-pin-to-25-pin adapter to connect the serial computer of the data cable to a 25-pin port. QPST can monitor up to eight serial ports and attached SURF phones.

Phones may be connected anytime QPST is running; the server and its components will recognize their presence.

2.3.2.1 Connecting SURF phones

Figure 2-1 illustrates how to connect SURF phones.

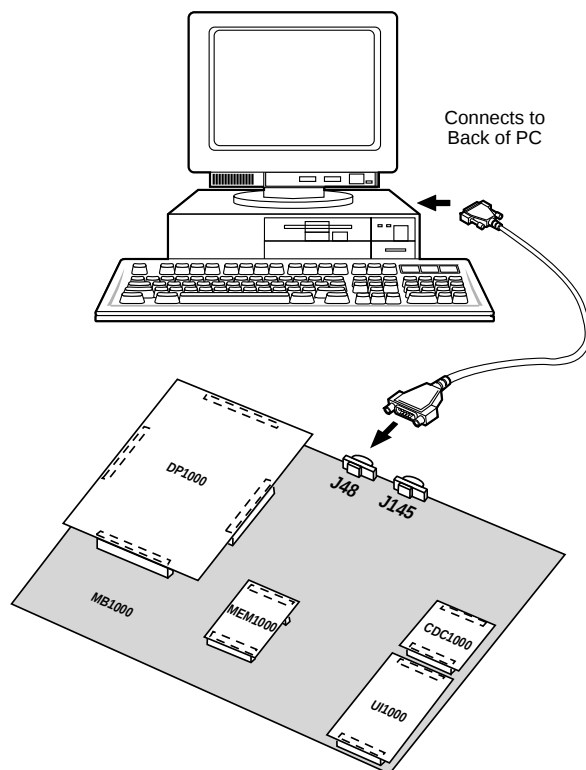


Figure 2-1 Connecting SURF phones

1. Plug the female end of the included serial cable into the 16550 Serial I/O card or the serial port connector of the PC.
2. Plug the male end of the included serial cable into the PC interface connector (UART1) on the SURF development system.

CAUTION For service programming, use either the UART1 or UART2 connector. For software upgrades, use only the UART1 connector.

2.3.2.2 Connecting Form Factor Accurate (FFA) phones

Figure 2-2 illustrates how to connect a QUALCOMM FFA3100-800, FFA3100-1900, or FFA3100-TM to the QPST computer using a TDIP connector and black box. Other types of interface cables may be available for the phones you will be using.

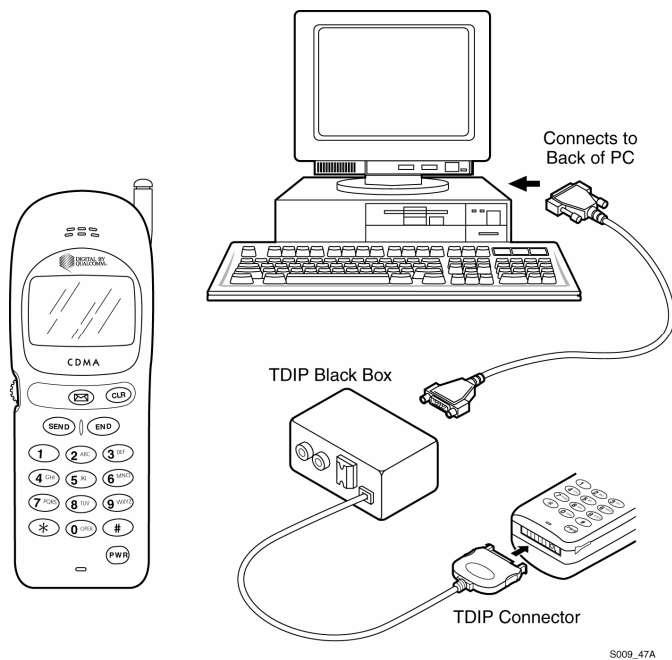


Figure 2-2 Connecting FFA phones

2.3.3 Installing QPST software

To install the QPST software:

1. Use Explorer to locate the file setup.exe in the CD's root directory. Double-click this file to launch the setup program.
2. To continue the installation, follow the instructions provided by the installer. This could include additional reboots depending on your operating system version and that of certain system files that QPST may need to update.
3. After rebooting your computer, relaunch the setup program by double-clicking the file setup.exe in the CD's root directory. When the Setup Complete dialog appears, the application has been installed successfully.
4. To complete installation, click FINISH or press ENTER.

2.3.4 QPST initial start

To start QPST for the first time, from the Start menu, select Programs→QPST→QPST Configuration.

This starts the QPST Configuration application, which lets you set up phones and start other QPST applications. See Chapter 3 for more information on the QPST Configuration application.

2.4 QPST server

The QPST server runs when:

- QPST Configuration application is started
- Any client application, such as Service Programming, is started and requires the QPST server

When the QPST server is running, you will see its icon (a globe) on the Windows taskbar.

- To display the server's connection status, hold the pointer over the icon.
- To open a menu for starting the QPST client applications or stopping the QPST, right-click the QPST server icon.
- To open the QPST Configuration application, double-click the QPST icon.
- To shut down the QPST server, right-click its icon on the Windows taskbar, then select Stop QPST Server from the menu that appears. Avoid shutting down the server if any QPST client applications are running.
- To enable or disable the server's automatic shutdown feature, right-click the server's icon on the Windows taskbar, then select Auto Server Shutdown from the pop-up menu that appears. When this menu item appears with a check mark, the server shuts itself off when it detects that no client applications are running. Otherwise, the server continues to run until you stop it yourself or shut down Windows.

You can also control the server from the QPST Configuration application as described in Section 3.5.

2.5 QPST help

QPST's Help menus give you access to online hypertext information about using each application in QPST.

To open QPST Help from any component application, select Contents from the Help menu, or press F1.

3 QPST Configuration

QPST Configuration is the client application used to monitor the status of:

- Active phones
- Available serial ports
- Active clients

QPST Configuration can run concurrently with other QPST clients.

To start QPST Configuration, from the Start menu, select Programs→QPST→QPST Configuration.

3.1 Active phones

The Active Phones tab lists the phones currently connected to the QPST server, as shown in Figure 3-1.

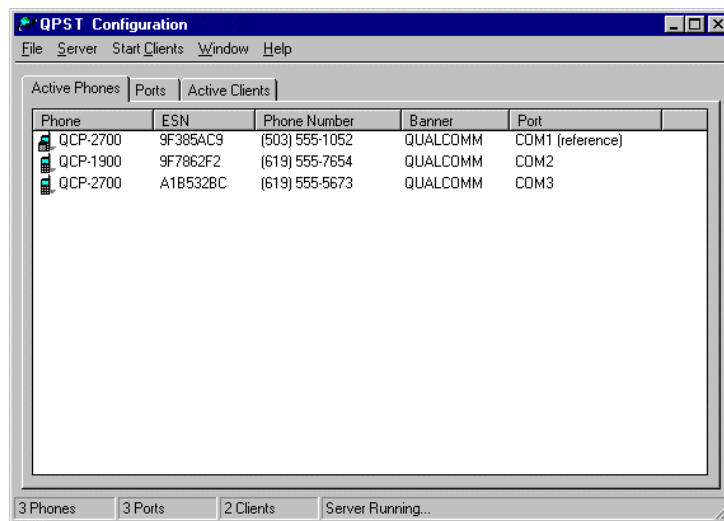


Figure 3-1 Active Phones tab dialog

Table 3-1 describes the information listed for each connected phone.

Table 3-1 Phone information

Column	Description
Phone	Type of phone connected to the QPST server at this port
ESN	Phone's electronic serial number
Phone Number	Telephone number assigned to this phone
Banner	Phone's current banner (user-configurable text)
Port	Serial (COM) port to which the phone is connected and a user-definable label to identify the port, if one exists

Click any column heading on this tab to sort the entries on the tab by the values in that column, in ascending order. Hold down the Shift key while clicking a heading to sort similarly in descending order.

NOTE Phones that are currently being accessed by another QPST client are listed with a distinctive icon which indicates that they have been “locked” by that client.



This locking indicator is provided to prevent multiple clients that are sharing the same pool of phones from disrupting operations in progress by trying to access the same phone simultaneously.

To view the properties of a phone listed in the Active Phones tab, double-click its entry. The Phone Properties dialog appears and lists information for the phone, as shown in Figure 3-2.

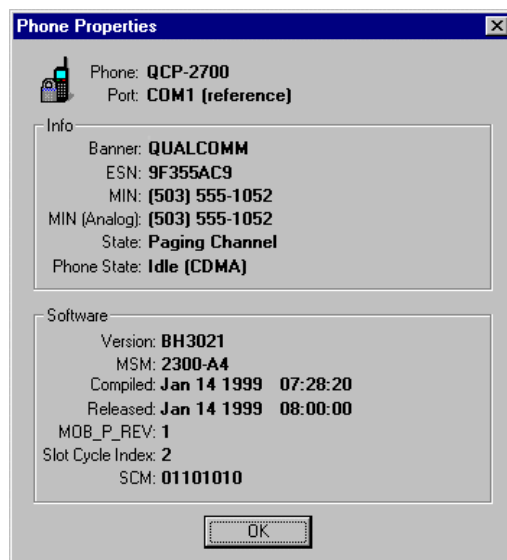


Figure 3-2 Phone Properties dialog

The icon in the above illustration indicates that a phone is locked by another QPST client.

NOTE You cannot get properties for a phone that is in the process of receiving a software download.

The information in the Phone Properties dialog is described in Table 3-2.

Table 3-2 Phone Properties dialog information

Item	Description
Phone	Model designation of the phone
Port	Serial (COM) port to which the phone is connected
Banner	User-definable banner that appears on this phone
ESN	Phone's electronic serial number, a read-only hexadecimal number set by the manufacturer
MIN	Phone's mobile identification number—the phone number
MIN (Analog)	Phone's analog mobile identification number—the analog phone number
State	Phone's CDMA machine state: Sync Channel, Paging Channel, Traffic Channel, and so on
Phone State	Phone's current state of operation: Idle, Initialization, Conversation, and so on
Version	Phone's software version
MSM	Phone's ASIC revision number, or "Unknown," listed with the phone's vocoder version (major_ver.minor_ver)
Compiled	Date the phone's software was compiled (includes the month, day, year, and timestamp).
Released	Date the phone's software was released (includes the month, day, year, and timestamp)
MOB_P_REV	Mobile Protocol Revision, or CDMA air interface protocol version that the phone supports
Slot Cycle Index	Phone's currently set slot cycle index value; controls the frequency at which the phone checks the paging channel in slotted sleep mode
SCM	Station class mark that specifies the phone hardware's transmit and receive capabilities

3.2 Ports

Click the Ports tab to display the serial ports available on your computer, as shown in Figure 3-3.

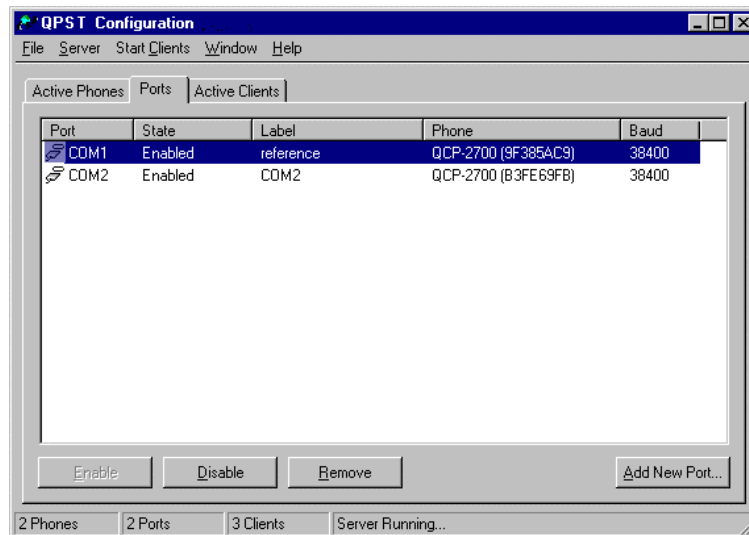


Figure 3-3 Ports tab

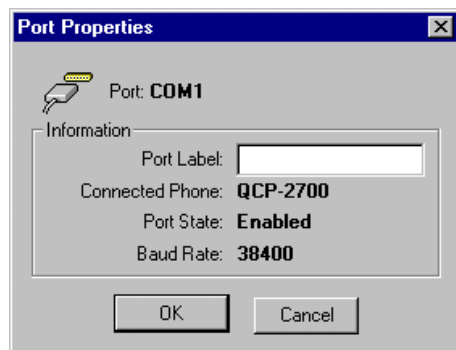
Table 3-3 describes the information listed for each serial port.

Table 3-3 Ports tab information

Column	Description
Port	Available ports on host computer
State	Enabled, Disabled, Not Available, or Pending
Label	A text label you can assign by double-clicking on a port
Phone	Banner text
Baud	Baud rate of the serial port, set automatically by QPST

Click any column heading on this tab to sort the entries on the tab by the values in that column, in ascending order. Hold down SHIFT while clicking a heading to sort similarly in descending order.

1 Double-click a port's entry to display the Port Properties dialog, as shown in Figure 3-4.



2
3 **Figure 3-4 Port Properties dialog**

4 This dialog lets you assign a custom name to the port to more easily identify it in the list. To
5 assign a name, type it in the Port Label box and click OK.

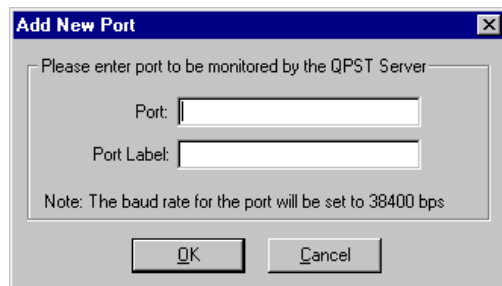
6 If there are serial ports on your computer that you do not want accessed by QPST applications,
7 you can disable them or remove them from the list of available ports entirely by clicking DISABLE
8 or REMOVE.

9 When you select a port and click DISABLE, QPST checks the port for an attached phone that is
10 locked for exclusive access, and will not disable the port if it finds one. A disabled port still
11 appears in the list of ports displayed by the Configuration application but is no longer monitored
12 for attached phones.

13 To return a port that is disabled back into use, click its entry on this tab, then click ENABLE.

14 When you select a port and click REMOVE, that port's state is changed to Pending, which means
15 that the port is still being monitored and can be used until the server restarts. After you restart the
16 server, the port will no longer be monitored or displayed in the list of ports.

17 To add a new serial port, or to add one that was previously removed, click its entry on this tab,
18 then click ADD NEW PORT. The Add New Port dialog appears prompting you for the serial port's
19 designation (COMnumber) and an optional label for the port, as shown in Figure 3-5.



20
21 **Figure 3-5 Add New Port dialog**

3.3 Active Clients

Click the Active Clients tab to see a list of the currently running client applications, as shown in Figure 3-6.

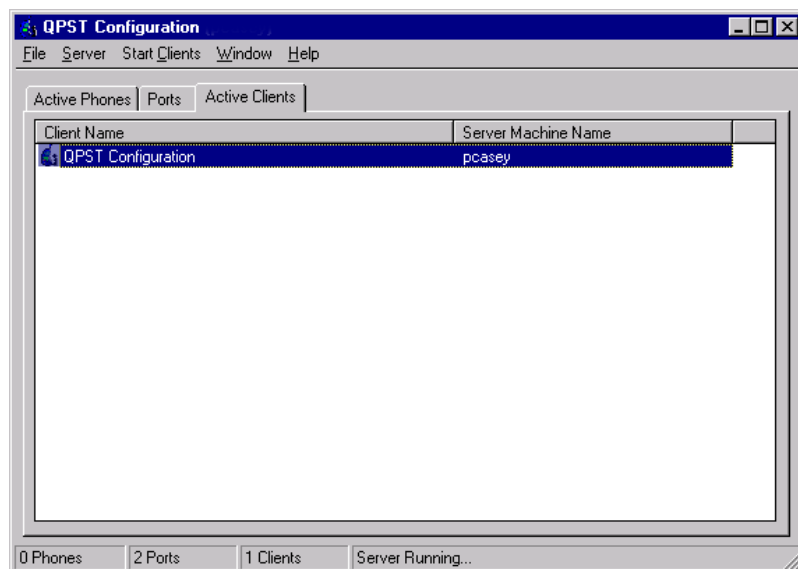


Figure 3-6 Active Clients tab

Clicking any column heading on this tab sorts the entries on the tab by the values in that column, in ascending order. Holding down Shift while clicking a heading sorts similarly in descending order.

Additionally, you can double-click a client entry in the list to view that client application's properties, including the version number, as shown in Figure 3-7.



Figure 3-7 Client Properties dialog

3.4 Starting other QPST applications

QPST Configuration provides a Start Clients menu that allows you to run the other QPST client applications without having to access the Start menu or the QPST server's icon on the Windows taskbar.

3.5 Server menu

QPST Configuration also provides a Server menu that contains two commands:

- Start/Stop QPST Server
- Properties

When the server is running, the Server menu displays a Stop QPST Server command that allows you to stop the server. When the server is not running, the Start QPST Server command is available on the menu. Together, these commands allow you to cycle the server off and on in case you encounter any system problems while running it.

NOTE Close any other QPST clients that are running before stopping the QPST server.

If you select Properties from the Server menu, a dialog appears that lists all currently registered components of QPST, as shown in Figure 3-8.

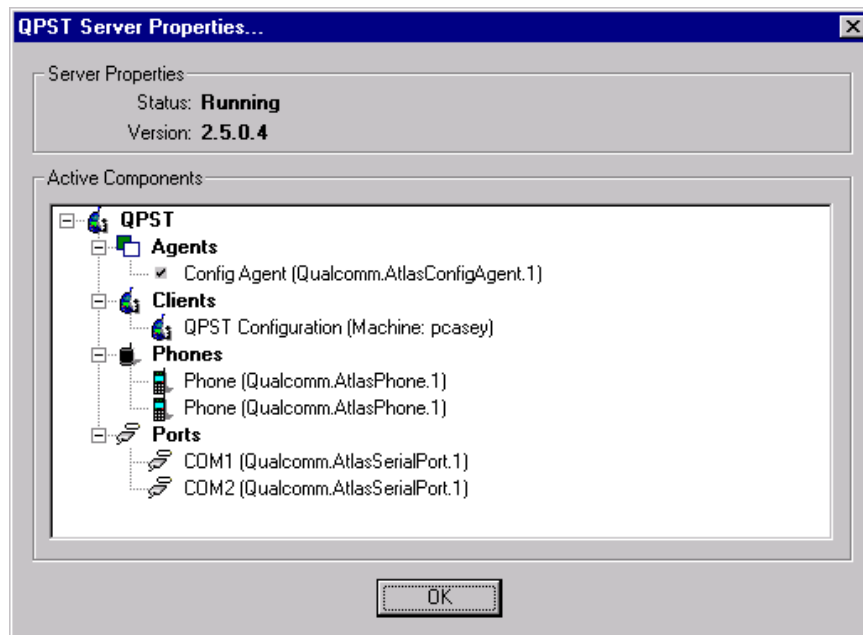


Figure 3-8 Server Properties dialog

While this information may be of use to QUALCOMM technical support representatives and other advanced users, it has little utility for most QPST users.

4 Service Programming

Service Programming (SP) is the QPST client application used to provide service programming for CDMA phones that contain QUALCOMM ASICs. With it, you can save SP data to a file, then download the data in that file to multiple phones.

The SP application accesses settings regardless of the phone's internal memory implementation. It is feature-aware and displays settings pages appropriate to the phone being programmed.

To start SP, from the Start menu, select Programs→QPST→Service Programming. The first window appears, as shown in Figure 4-1.

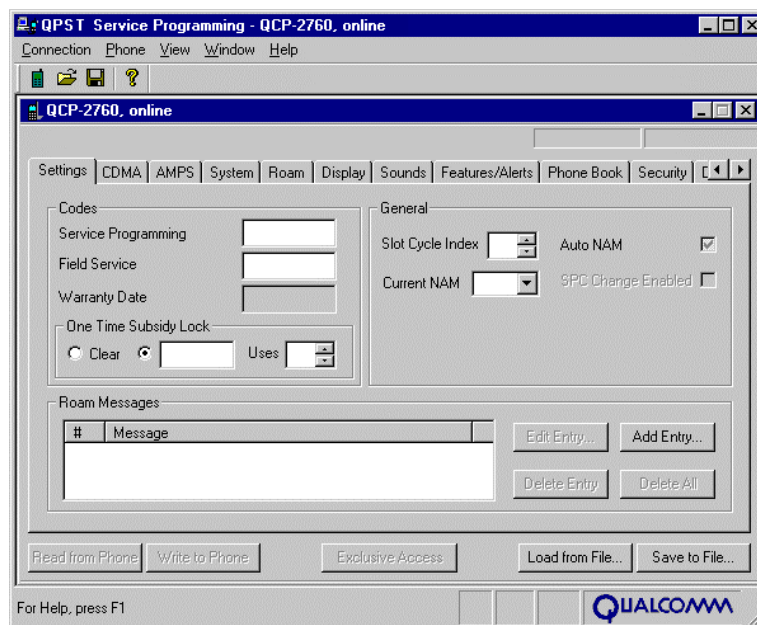


Figure 4-1 Service Programming first window

NOTE The tabs and fields that you see in the SP application are specific to the model of phone being programmed and may be different from the illustrations in this book. The items listed for each tab in this chapter include all options for all phones currently supported by the SP application. If no phone is currently connected, a dialog precedes the screen shown in Figure 4-1.

The SP client consists of up to 17 settings page tabs:

- Settings
- CDMA
- CDMA-2
- AMPS
- System
- Roam
- Display
- Sounds
- Features/Alerts
- Phone Book or PRI
- Security
- Data/Web
- Broadcast SMS
- Multimedia audio
- gpsOne
- Mobile IP
- Nonaccess Stratum

The settings on these tabs are described in the following sections.

The title bar of this application indicates the phone being programmed (by model number), the phone's connection status (*online* or *offline*), and the origin of any data read into the application (*from phone* or *from file*).

The following buttons, described in Table 4-1, appear at the bottom of the Service Programming window and apply to all settings on all tabs.

Table 4-1 Service Programming window buttons

Button	Description
Read from Phone	Reads the current data from the phone
Write to Phone	Writes all settings to the phone
Exclusive Access	Places a lock on a shared phone, use this to prevent other clients from making changes to the phone you are programming, prior to writing to it
Load from File	Reads default or previously saved data to the Service Programming tabs
Save to File	Saves settings to a file you specify

NOTE When you click either **WRITE TO PHONE** or **SAVE TO FILE**, all current SP parameters are copied to the QPST server. Any changes you make in the Service Programming tabs during this copy process are not written to the phone or saved to file until the next time you click the button. So, the contents of the SP tabs at the moment you click the button are what is written or saved, regardless of what you type while waiting for the process to complete.

4.1 Settings tab

Figure 4-2 depicts the Settings tab.

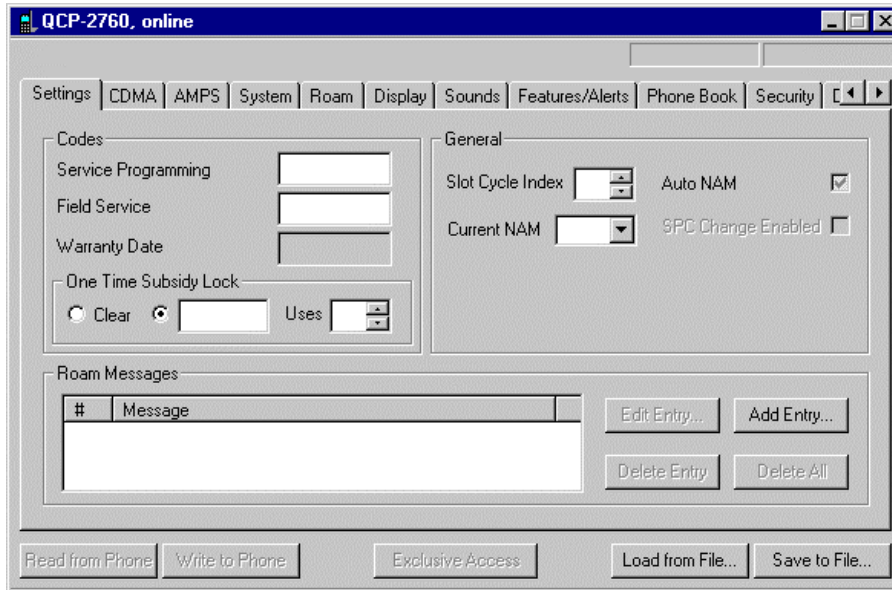


Figure 4-2 Settings tab

The items displayed on the Settings tab are described in Table 4-2.

Table 4-2 Settings tab information

Setting	Description
Service Programming	6-digit numerical code that allows access to Service Programming
Field Service	6-digit numerical code that allows access to the phone's Debug menus
Warranty Date	Read-only date of manufacture code
One Time Subsidy Lock	6-digit numerical code that allows limited access to Service Programming. To disable it, click the Clear option button. To enable it, click the option button next to the text box, then type a 6-digit code. You can also specify a number in the Uses box to specify the number of times the code can be used
Restriction Password	4-digit alphanumeric password used to restrict access to WLL phones
Slot Cycle Index	Value, 0 to 7, corresponding to the slot cycle, the duration and frequency that the phone checks the paging channel; 7 is the largest slot cycle value, and the default is 1
Current NAM	Drop-down list specifying the NAM to use; number of NAMs supported depends on the phone's software
Auto NAM	When checked, this check box specifies that the NAM is autoselected when roaming
SPC Change Enabled	Toggles the ability to change the SPC from a default value to a nondefault one through IS-683-A OTASP

Setting	Description
Dialing Plan	Dialing plan to be used for WLL phones. Settings are: ■ None ■ US ■ India DOT ■ India DOT (Long) ■ Russia, Myanmar ■ Russia (Moscow) ■ Programmable ■ Brazil
Restriction Level	Password restriction levels for WLL phones. Settings are: ■ No Restriction ■ Default Level 1 through Default Level 9
Roam Messages	This area of the tab lets you specify text messages to override the roaming messages preprogrammed in the phone. The buttons in this area let you add, edit, and delete these messages. Specify a location number to designate the memory location of the message you want to replace, along with a message of up to 12 characters
Edit Entry	Click this button to edit the roaming message currently selected in the Roam Message list
Add Entry	Click this button to specify a new roaming location and message
Delete Entry	Click this button to delete the roaming message currently selected in the Roam Message list
Delete All	Click this button to delete all the roaming messages in the Roam Message list

4.2 CDMA tab

Figure 4-3 depicts the CDMA tab.

Figure 4-3 CDMA tab

The items displayed on the CDMA tab are described in Table 4-3.

Click the NAM buttons to view settings for the various NAMs.

Table 4-3 CDMA tab information

Setting	Description
NAM Name	Service provider or carrier name, up to 12 characters, for the given NAM
Directory #	Phone directory number, 10 decimal digits (0–9)
Access Overload Class	Access overload class for each NAM, normally set to the last digit of the CDMA phone number. 10=Test, 11=Emergency, 12–15 are reserved. Some phones will override settings other than these
Phone Number MCC	3-digit Mobile Country Code corresponding to the first three digits of the IMSI number
Phone Number 11_12	2-digit IMSI_11_12 number corresponding to the fourth and fifth digits of the IMSI number
Phone Number IMSI_S	10-digit CDMA International Mobile Station Identity, the CDMA phone number
Terminated Registration Home SID	Toggles CDMA Mobile-terminated home registration for the given NAM.
Terminated Registration Foreign SID	Toggles CDMA Mobile-terminated foreign SID Registration for the given NAM
Terminated Registration Foreign NID	Toggles CDMA Mobile-terminated foreign NID Registration for the given NAM
Channel Primary A	Primary CDMA channel for the given NAM: 11-bit channel number (1–2047); default channel is 283
Channel Primary B	Primary CDMA channel for the given NAM: 11-bit channel number (1–2047); default channel is 384
Channel Secondary A	Secondary CDMA channel for the given NAM: 11-bit channel number (1–2047); default channel is 691
Channel Secondary B	Secondary CDMA channel for the given NAM: 11-bit channel number (1–2047); default channel is 777
EVRC Service Options EVRC Enabled	Toggles the EVRC service options; when enabled, the phone will select an EVRC call if the Home Page/Home Orig/Roam Orig type matches that of the base station
EVRC Service Options Home Page	EVRC service options home page type: Wild, IS96A, EVRC, 13K, or IS96
EVRC Service Options Home Orig	EVRC service options home orig type: Wild, IS96A, EVRC, 13K, or IS96
EVRC Service Options Roam Orig	EVRC service options roam orig type: Wild, IS96A, EVRC, 13K, or IS96

4.3 CDMA-2 tab

Figure 4-4 depicts the CDMA-2 tab.

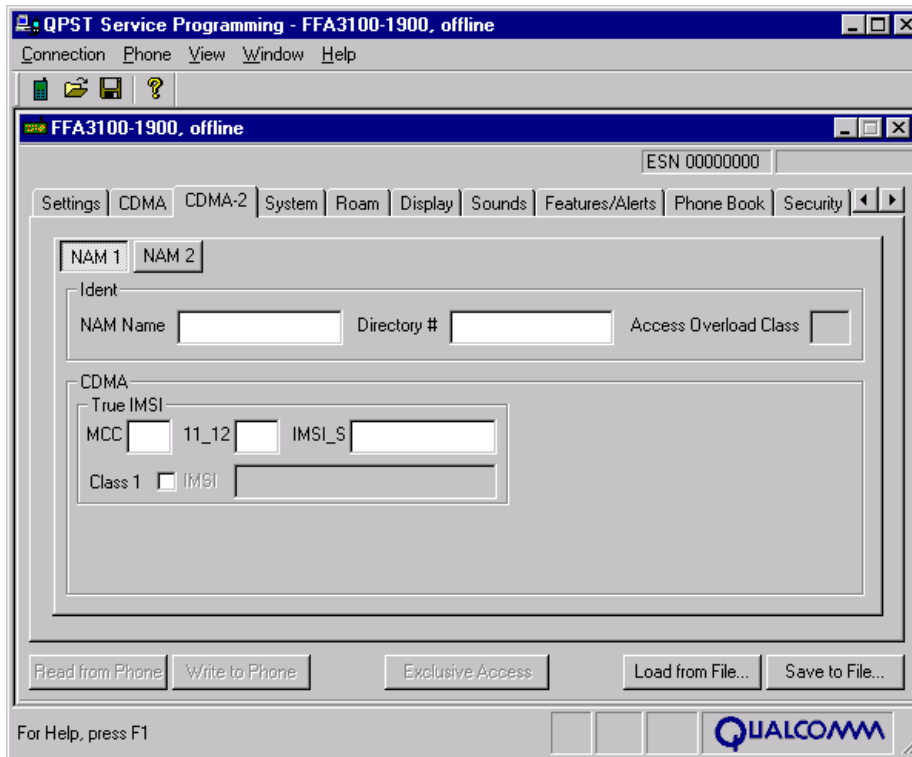


Figure 4-4 CDMA-2 tab

The items displayed on the CDMA-2 tab are described in Table 4-4. Click the NAM buttons to view settings for the various NAMs.

Table 4-4 CDMA-2 tab information

Setting	Description
NAM Name	Service provider or carrier name, up to 12 characters, for the given NAM
Directory #	Phone directory number, 10 decimal digits (0–9)
Access Overload Class	Access overload class for each NAM, normally set to the last digit of the CDMA phone number. 10=Test, 11=Emergency, 12–15 are reserved. Some phones will override settings other than these.
True IMSI MCC	3-digit Mobile Country Code corresponding to the first three digits of the IMSI number
True IMSI 11_12	2-digit IMSI_11_12 number corresponding to the fourth and fifth digits of the IMSI number
True IMSI IMSI_S	10-digit CDMA International Mobile Station Identity, the CDMA phone number
True IMSI Class 1	If unchecked, allows entry of the Class 0 IMSI into the MCC, 11_12, and IMSI_S fields, if checked, allows entry of the Class 1 IMSI into the IMSI field
IMSI	7–14 digit Class 1 IMSI

4.4 AMPS tab

Figure 4-5 depicts the AMPS tab.

Figure 4-5 AMPS tab

The items displayed on the AMPS tab are described in Table 4-5.

Click the NAM buttons to view settings for the various NAMs.

Table 4-5 AMPS tab information

Setting	Description
NAM Name	Service provider or carrier name of up to 12 characters for the given NAM
Directory #	10-digit phone directory number
Access Overload Class	Access overload class for each NAM, normally set to the last digit of the CDMA phone number. 10=Test, 11=Emergency, 12–15 are reserved. Some phones will override settings other than these
Phone Number	AMPS area code and phone number for the given NAM
Registration	Specifies whether the phone will perform an autonomous registration. Settings are: ■ Disabled ■ Yes ■ Hide – Hide means yes, but makes whereabouts unknown
1st Paging Channel	First analog channel (11-bit value: 1–2047) for the given NAM – 333 for carrier A, 334 for carrier B
Home SID	Cellular Service Provider ID – the analog home system ID for the given NAM

4.5 System tab

Figure 4-6 depicts the System tab.

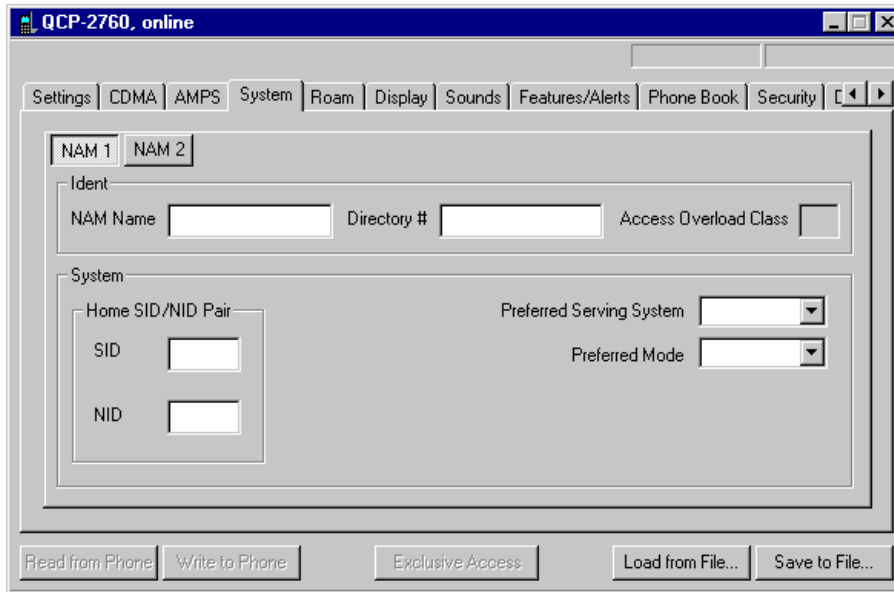


Figure 4-6 System tab

The items displayed on the System tab are described in Table 4-6.

Click the NAM buttons to view settings for the various NAMs.

Table 4-6 System tab information

Setting	Description
NAM Name	User-selectable name of up to 12 characters for the given NAM
Directory #	10-digit phone directory number
Access Overload Class	Access overload class for each NAM, normally set to the last digit of the CDMA phone number. 10=Test, 11=Emergency, 12–15 are reserved. Some phones override settings other than these
Home SID/NID Pairs	CDMA Home SID/NID pairs for the given NAM, Cellular. First SID cannot be 0; all SIDs must be same parity. One pair for PCS; SID can be 0
Lock SID List	SID lockout list for the given NAM
Preferred Serving System	Preferred server: Standard, A Only, B Only, or Home Only
Preferred Mode	Preferred phone mode: Automatic or Digital Only

4.6 Roam tab

Figure 4-7 depicts the Roam tab.

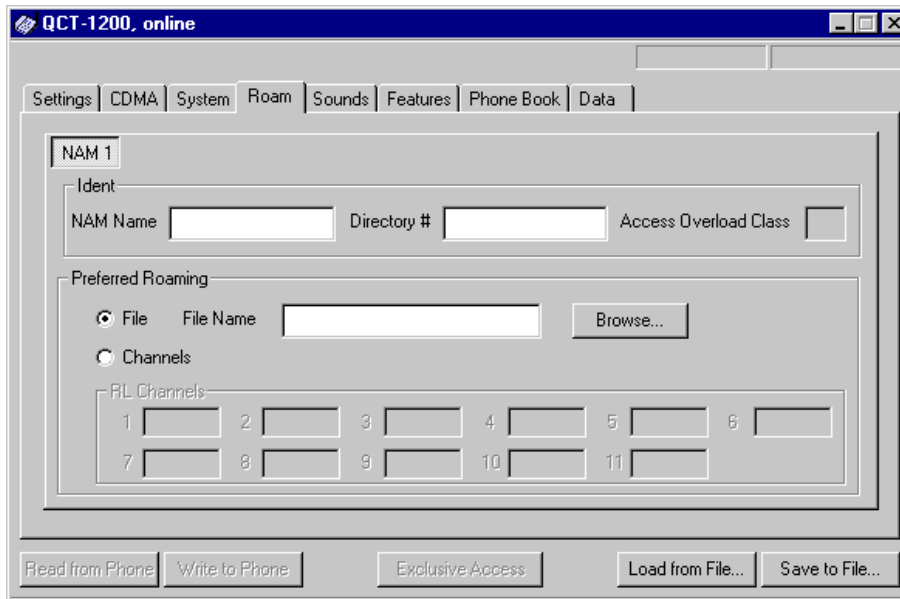


Figure 4-7 Roam tab

The items displayed on the Roam tab are described in Table 4-7.

Click the NAM buttons to view settings for the various NAMs.

Table 4-7 Roam tab information

Setting	Description
NAM Name	Name for the given NAM of up to 12 characters.
Directory #	10-digit phone directory number.
Access Overload Class	Access overload class for each NAM, normally set to the last digit of the CDMA phone number. 10=Test, 11=Emergency, 12–15 are reserved. Some phones override settings other than these.
Preferred Roaming Enabled	Toggles the use of the preferred roaming list (PRL)
File	File containing the PRL read from a phone or file, or one you wish to write into the phone. Click BROWSE to locate a file. On phones that support preferred roaming channels, you must select the File option button to specify this file
Channels	Selecting the Channels option, for WLL phones that support it, allows you to enter up to 11 preferred roaming channels on this tab which will be used to create a roaming list

4.7 Display tab

Figure 4-8 depicts the Display tab.

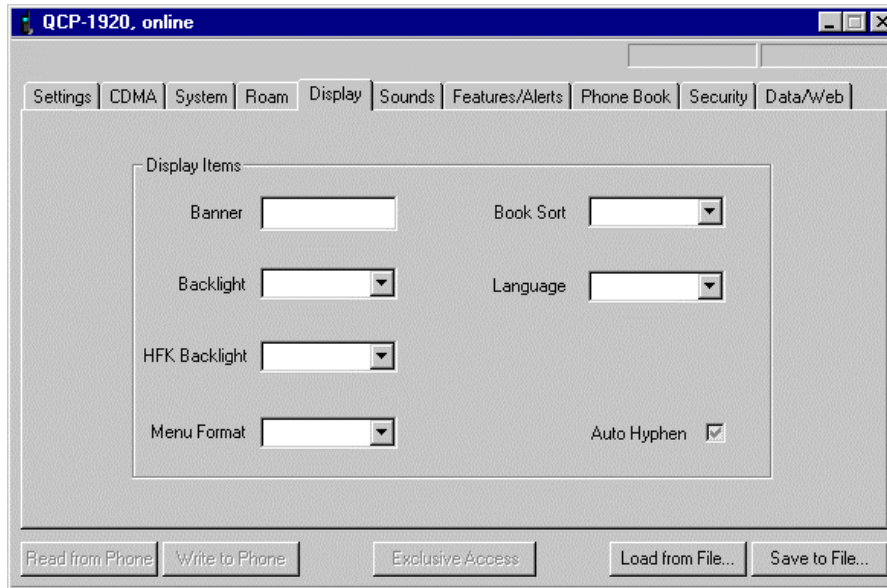


Figure 4-8 Display tab

The items displayed on the Display tab are described in Table 4-8.

Table 4-8 Display tab information

Setting	Description
Banner	Banner to be displayed when the phone is idle, up to 12 characters Note: If the Banner setting on this tab appears blank after being read from a phone, the Banner field may seem like it will not accept any input. This is because the field actually contains 12 spaces, and cannot accept any more input. To type a banner value in the field, first drag the cursor over the blanks. You can then type a banner value of up to 12 characters.
Backlight	Drop-down list of backlight settings specific to the current phone model
HFK Backlight	Drop-down list of hands-free kit backlight settings corresponding to the list of Backlight settings
Menu format	Drop-down list of menu format settings, Long or Short
Book Sort	A drop-down list of phone book sorting methods: Location # or Alphabetic
Language	Language selection for the phone menus: English, Español, Français, Português
Show Time Available	Toggles whether the time is displayed, if available
Auto Hyphen	Toggles autohyphen feature

4.8 Sounds tab

Figure 4-9 depicts the Sounds tab.

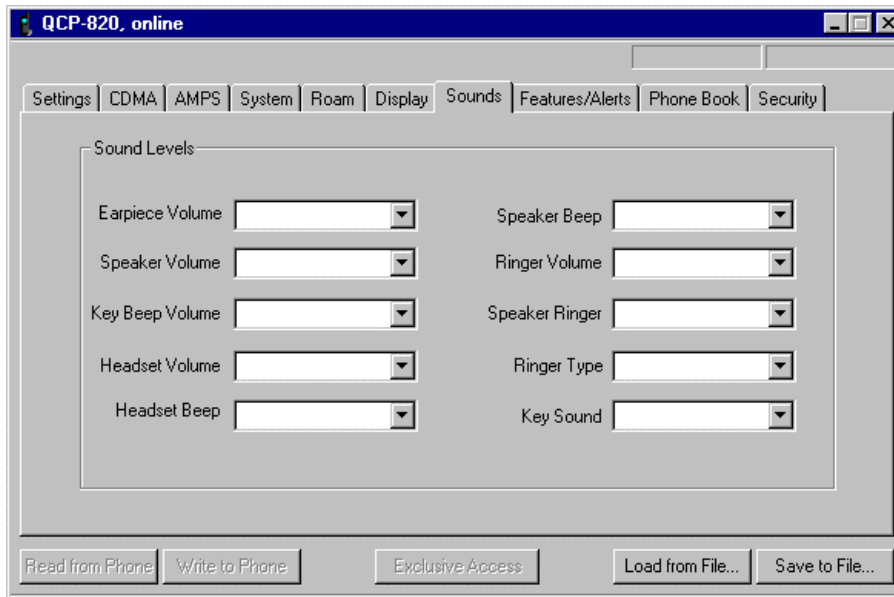


Figure 4-9 Sounds tab

The drop-down list items displayed on the Sounds tab are described in Table 4-9. For all items, the available settings correspond to those on the handset.

Table 4-9 Sounds tab information

Setting	Description
Earpiece Volume	Handset earpiece volume level settings
Speaker Volume	Hands-free kit speaker volume level settings
Key Beep Volume	Keypad beep volume level settings
Headset Volume	Hands-free kit headset volume level settings
Headset Beep	Hands-free kit headset beep volume level settings
Speaker Beep	Hands-free kit speaker key beep volume level settings
Ringer Volume	Ringer volume level settings
Speaker Ringer	Hands-free kit speaker ringer level settings
Ringer Type	Ringer type options
Key Sound	Key sound options, tones or clicks
Ringer Frequency	Specifies the ringer frequency for WLL phones: 17 Hz, 20 Hz (the default), 25 Hz, or 50 Hz

4.9 Features/Alerts tab

Figure 4-10 depicts the Features/Alerts tab.

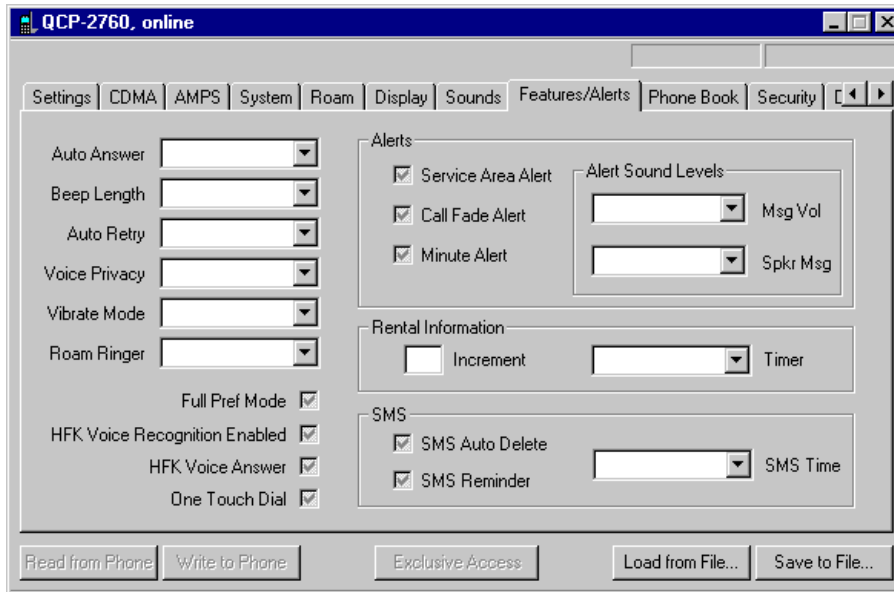


Figure 4-10 Features/Alerts tab

The items displayed on the Features/Alerts tab are described in Table 4-10.

Table 4-10 Features/Alerts tab information

Setting	Description
Auto Answer	Toggles autoanswer feature: on or off
Beep Length	Toggles the length, standard or long, of a keypress tone as heard by the system that you dialed (usually a voicemail system). The difference may or may not be audible in the phone's earpiece, depending on the phone model
Auto Retry	Drop-down list of autoretry options: Off, 10, 30, or 60 seconds
Voice Privacy	Specifies the voice privacy level; Standard or Enhanced
Vibrate Mode	Vibrate mode setting: Ring, Vibrate/Ring, or Vibrate Only
Roam Ringer	Determines ringer type for incoming calls when roaming; settings are Off, Roam Ringer, or Prompt
Full Pref Mode	Toggles the full set of preferred mode options on the phone's network menu
HFK Voice Recognition Enabled	Toggles voice recognition functionality when used with hands-free kit
HFK Voice Answer	Toggles voice answer functionality when used with hands-free kit
One Touch Dial	When checked, enables one- (or two-) touch dialing feature
Any Key Answer	When checked, pressing any key will answer an incoming call
Carrier Info Filename	Name of the carrier information file to be loaded
Pay Phone Enabled	Toggles Pay Phone feature in WLL phones

Setting	Description
DSP Answer Detect Enabled	Toggles DSP Answer detection in WLL phones
Bell Modem Enabled	Toggles Bell Modem functionality in WLL phones
Dialing Plan File	Lets you specify a dialing plan (DPT) file to be read into a WLL phone
AFax Mode	Specifies the AFax mode for WLL phones, Standard or QC Mode
Polarity Reversal Timeout	Specifies the polarity reversal timeout for WLL phones, 0–255
Send Timeout	Specifies the send timeout for WLL phones, 4–20
Service Area Alert	Toggles whether a sound will alert the user when entering/exiting a service
Call Fade Alert	Toggles whether a sound will alert the user when a call is lost
Minute Alert	Toggles whether a sound will alert the user every 60 seconds during a call
Voice Priv Alert	Toggles whether a sound will alert the user when call privacy is not assured
SMS Alert	Controls the short message service alert that sounds when the user receives a text message; settings are Off, On, +Reminder
Alert Sound Levels Msg Vol	Volume setting for alerts on phones
Alert Sound Levels Spkr Msg	Volume setting for alerts on the hands-free or car kit
Rental Information Increment	Specifies the increment, in seconds, on which rental billing is based; smallest possible increment is 6 sec
Rental Information Timer	Sets the rental billing timer function
SMS Auto Delete	Indicates whether SMS message gets deleted when memory is full and new messages arrive
SMS Reminder	Toggles reminder beep when SMS messages arrive
SMS Time	Toggles whether the short message service timestamp will be displayed as received or adjusted from UTC time

4.10 Phone Book tab

Figure 4-11 depicts the Phone Book tab.

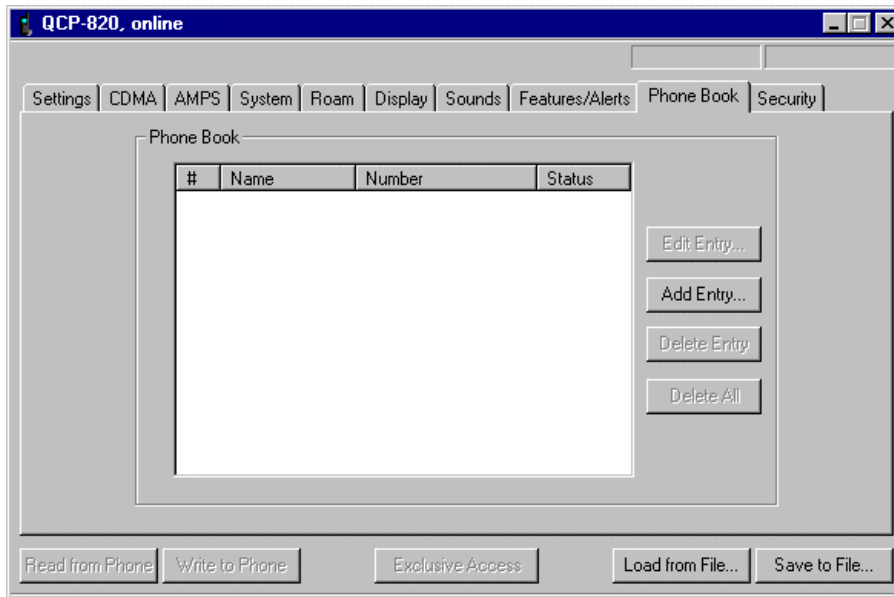


Figure 4-11 Phone Book tab

The columns and buttons displayed on the Phone Book tab are described in Table 4-11.

Table 4-11 Phone Book tab information

Column/Button	Description
#	Memory location where the number will be stored in the phone
Name	String that identifies this number, up to 12 characters
Number	Phone number of up to 32 digits; can include the pound (#), star (*), and dash (–) characters as well as the letters L, P, and T
Status	Whether this number is Public or Secret (restricted)
Entry Type	For WLL phones, this column displays the type of number for each entry in the phone book, based on its memory location
Voice Mail Messages	For WLL phones, this read-only field displays the number of waiting voice mail messages
Edit Entry	Click this button to edit the selected phone book entry in the resulting Edit Entry dialog
Add Entry	Click this button to add a new phone book entry in the resulting Add Entry dialog
Delete Entry	Click this button to delete the selected phone book entry
Delete All	Click this button to delete all phone book entries

4.11 Security tab

Figure 4-12 depicts the Security tab.

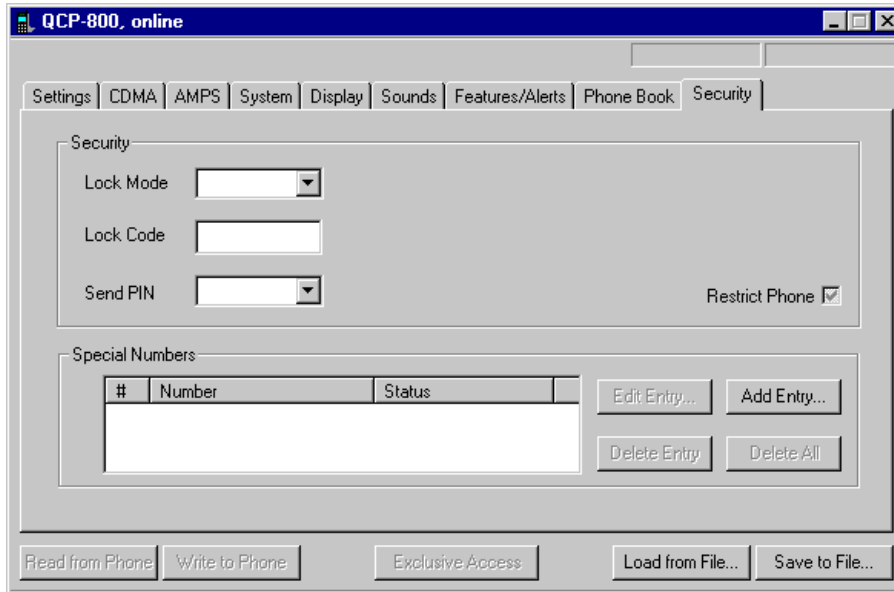


Figure 4-12 Security tab

The items displayed on the Security tab are described in Table 4-12.

Table 4-12 Security tab information

Item	Definition
Lock Mode	Specifies the phone's lock mode: Never or On powerup
Lock Code	4-digit lock code
Send PIN	Send PIN setting; Never or Prompt
Restrict Phone	Toggles the restricted dialing setting for the phone
#	Memory location where the special number will be stored in the phone
Number	Special phone number of up to 32 digits; can include the pound (#), star (*), and dash (–) characters as well as the letters L, P, and T. Special numbers are those that can be dialed when the phone is locked
Status	Whether this special number is Priority, E911, or OTASP
Edit Entry	Click this button to edit the special number entry in the resulting Edit Entry dialog
Add Entry	Click this button to add a new special number entry in the resulting Add Entry dialog
Delete Entry	Click this button to delete the selected special number entry
Delete All	Click this button to delete all special number entries

4.12 Data/Web tab

Figure 4-13 depicts the Data/Web tab.

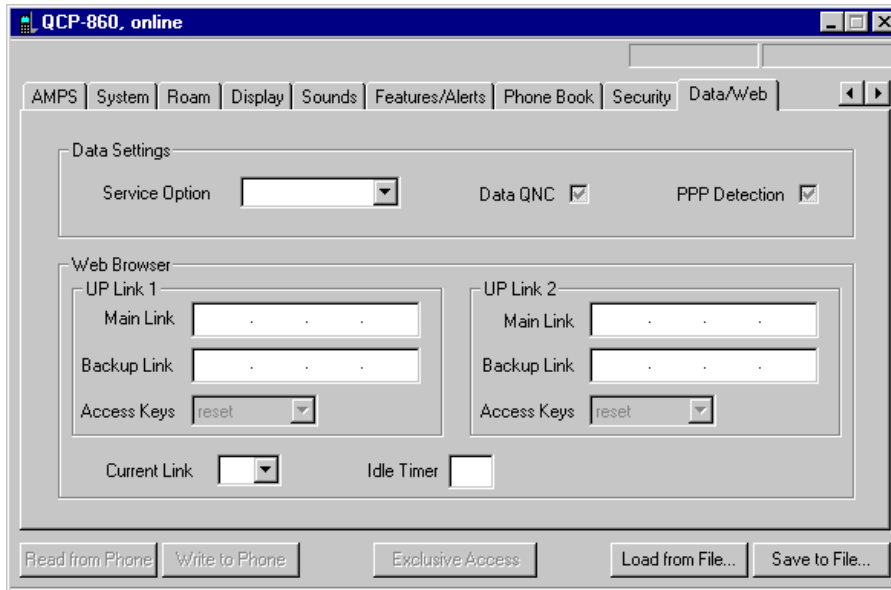


Figure 4-13 Data/Web tab

The items displayed on the Data/Web tab are described in Table 4-13.

Table 4-13 Data/Web tab information

Setting	Definition
Service Option	Specifies which data standard the phone uses to offer data services; settings are Pre-707, QUALCOMM Proprietary, or IS-707
Data QNC	Toggles whether the phone uses Quick Net Connect (when checked) or simple packet data for packet services
PPP Detection	Toggles PPP autopacket detection
Main Link	Main IP address for the first or second UP.Link™ server
Backup Link	Backup IP address for the first or second UP.Link server
Access Keys	Specifies whether the phone's preprogrammed UP.Link access key can be reset over the air; settings are Keep or Reset
Current Link	Current link (1 or 2) that the browser accesses
Idle Timer	Maximum idle time, in seconds, before the browser disconnects

4.13 Broadcast SMS tab

Figure 4-14 depicts the Broadcast SMS tab.

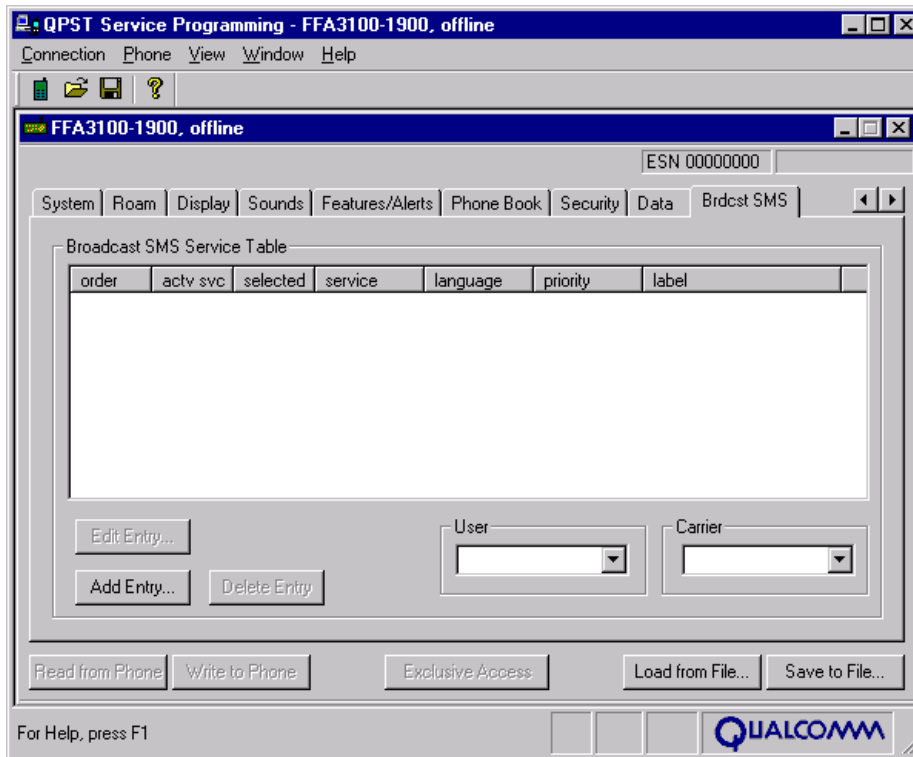


Figure 4-14 Broadcast SMS tab

The items displayed on the Broadcast SMS tab are described in Table 4-14.

Table 4-14 Broadcast SMS tab information

Column	Description
Order	Shows the position of this entry in the Broadcast SMS table
Actv Svc	Active service (yes/no)
Selected	Selected entry (yes/no)
Service	Category of service for this entry
Language	National language associated with this entry
Priority	Priority of this entry
Label	A label assigned to the entry, maximum of ten characters
User	User activation mode
Carrier	Carrier enable mode

4.14 Multimedia audio tab

Figure 4-15 depicts the Multimedia audio tab.

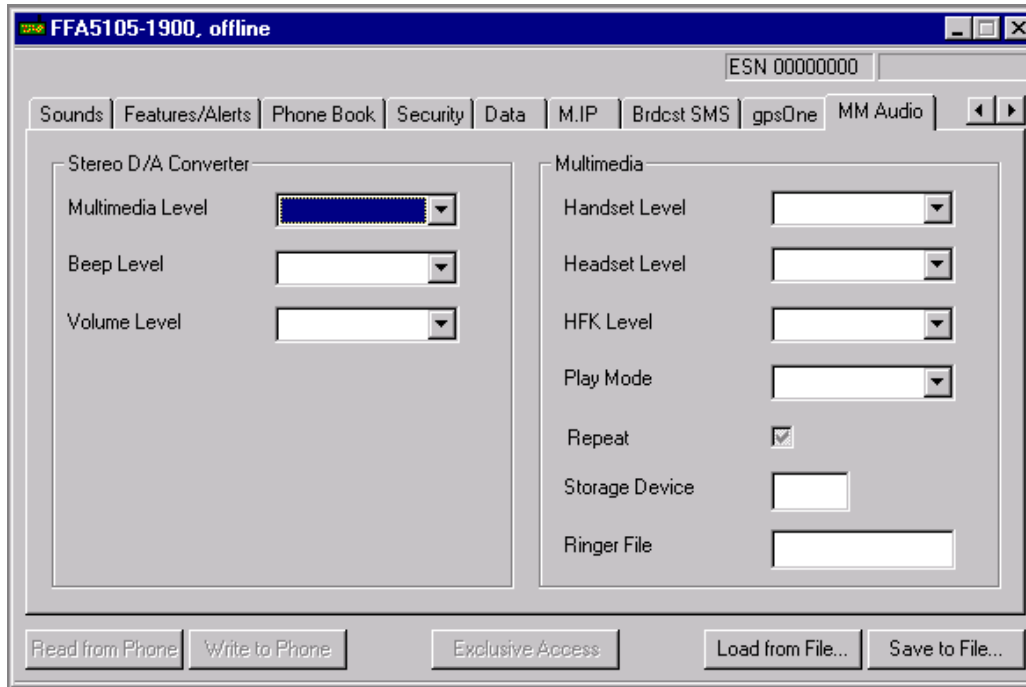


Figure 4-15 Multimedia audio tab

The items displayed on the Multimedia audio tab are described in Table 4-15.

Table 4-15 Multimedia audio tab information

Setting	Description
Multimedia level	Multimedia audio level (1-4)
Beep level	Multimedia beep level (off, 1-4)
Volume level	Multimedia volume level (1-4 or 1-7 depending on F_UI_SEVEN_LEVEL_SND_BIT feature bit setting)
Handset level	Handset level (1-4)
Headset level	Headset level (1-4)
HFK level	Hands-free kit level (1-4)
Play mode	Continuous or single mode
Repeat	Repeat mode
Storage device	MMC storage device 0-255
Ringer file	Name of ringer files in mobile's file system (40 characters)

4.15 gpsOne

Figure 4-16 depicts the gpsOne tab.

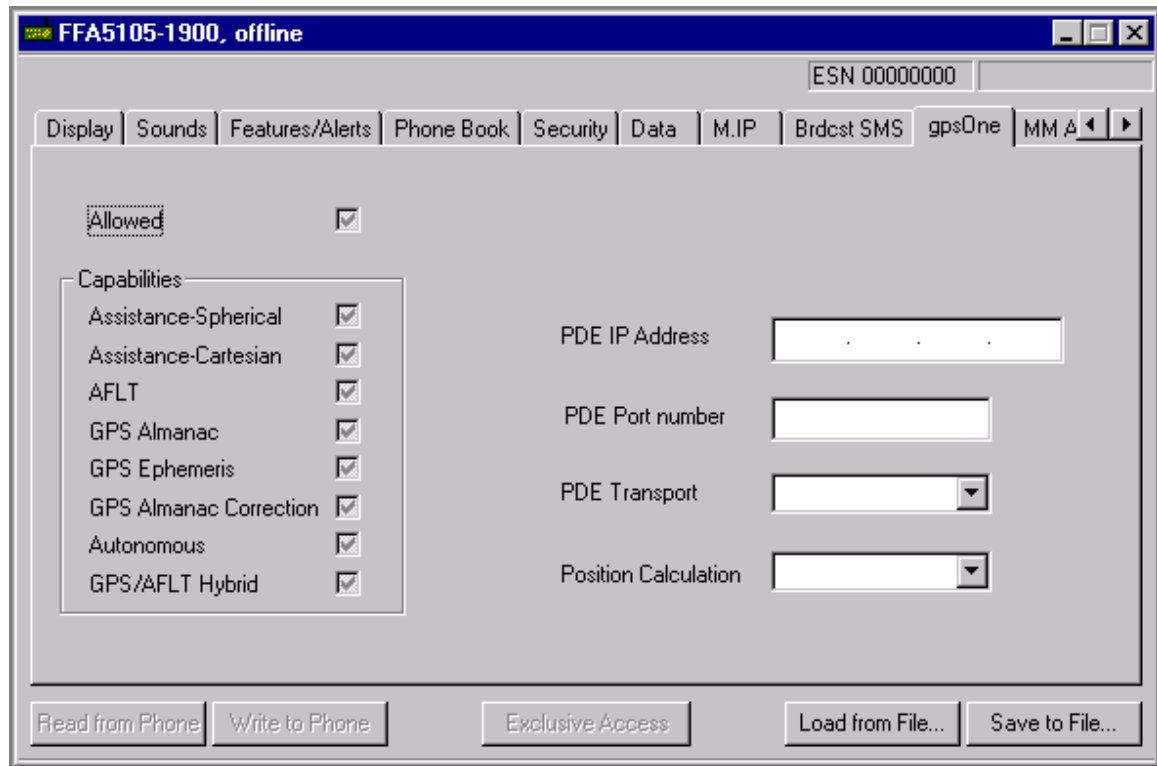


Figure 4-16 gpsOne tab

The items displayed on the gpsOne tab are described in Figure 4-16.

Table 4-16 gpsOne tab information

Setting	Description
Allowed	gpsOne allowed
Capabilities	Capabilities to enable
PDE IP address	IP address of PDE in dotted-decimal format
PDE port number	PDE port number in decimal
PDE transport	Choice of IP or DBM
Position calculation	Choice of Mobile or PDE

4.16 Mobile IP

Figure 4-17 depicts the Mobile IP tab.

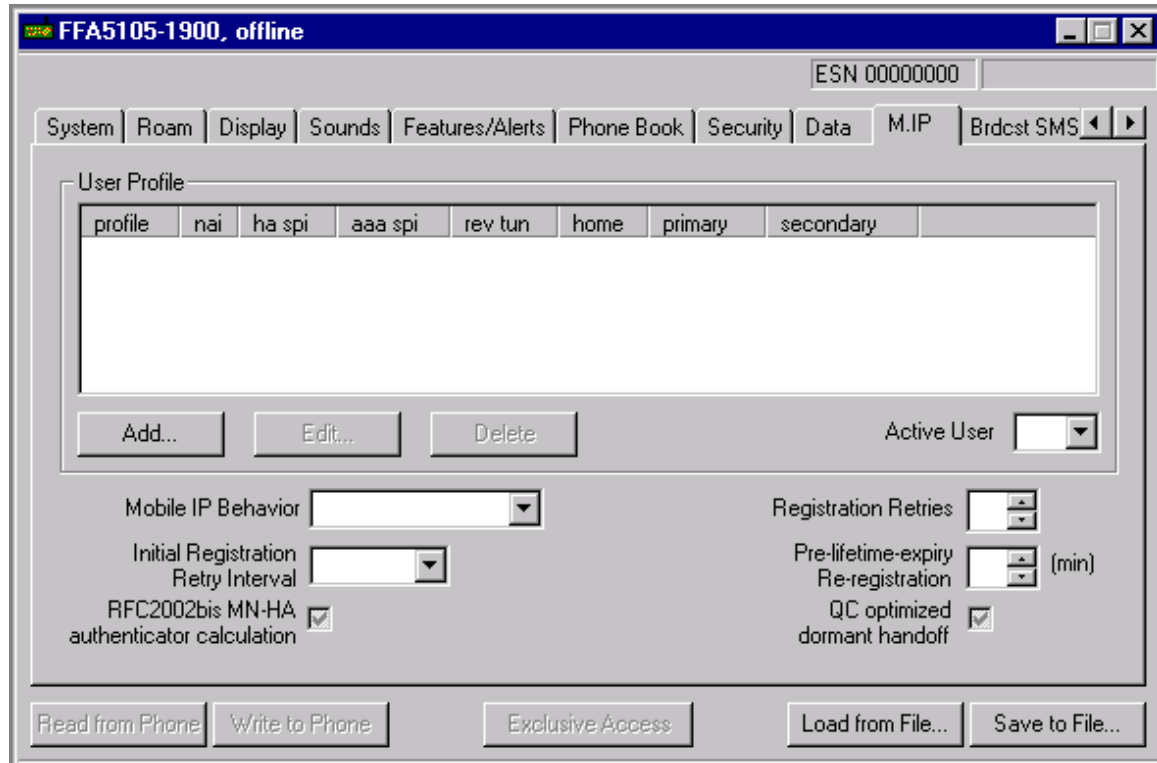


Figure 4-17 Mobile IP tab

The items displayed on the Mobile IP tab are described in Table 4-17.

Table 4-17 Mobile IP tab – user profile list

Setting	Description
profile	Profile number (0-5)
nai	Network Access Identifier
ha spi	Mobile Node – Home Agent Security Parameter Index (hexadecimal)
aaa spi	Mobile Node – Authentication Authorization Accounting Security Parameter Index (hexadecimal)
rev tun	Reverse tunneling preference
home	Home IP address
primary	Primary Home Agent IP address
secondary	Secondary Home Agent IP address

Table 4-18 Mobile IP tab – user profile control group

Setting	Description
Add	Press to add a new user profile. See "Adding or Editing a User Profile."
Edit	Select a user profile and click Edit to modify that profile. See "Adding or Editing a User Profile."
Delete	Select the last profile, click Delete to remove it.
Active User	Selects the profile Mobile IP will use.

Table 4-19 Mobile IP tab – general settings

Setting	Description
Mobile IP behavior	Simple IP only – Mobile IP disabled. Mob + Simp f/back – Mobile IP Preferred. In the initial M.IP registration, if the network does not support Mobile IP, then the mobile automatically reverts to Simple IP. Mob IP only – Mobile IP only. The mobile will make data calls only when the network supports Mobile IP.
Initial registration retry interval	Time for the first retry, 1000-2750 ms in 250-ms increments.
RFC2002bis MN-HA authenticator calculation	Selects RFC2002bis MN-HA authenticator calculation method. Otherwise, RFC2002 (SPI excluded) method is used.
Registration retries	Number of times the mobile will retry a registration attempt (0-3)
Pre-lifetime-expiry reregistration	The time before Mobile IP registration expiration to attempt reregistration (0-63 minutes)
QC optimized dormant handoff	QUALCOMM protocol revision 6 Mobile IP handoff optimization enable.

The User Profile list displays all defined user profiles. If you have less than six profiles defined, you may click **ADD** to append a new profile to the end of the profile list. You can edit an existing profile by double-clicking it, or by selecting it (with a single click) and then clicking **EDIT** or pressing **ENTER**. If you add or edit a profile, QPST will display the “Mobile IP Profile” dialog box.

Figure 4-18 Dialog box when editing or adding a Mobile IP user profile

The items displayed on the Mobile IP profile dialog box are described in Table 4-20.

Table 4-20 Mobile IP profile dialog box

Setting	Description
NAI	Network Access Identifier string, up to 72 characters.
HA Shared Secret	Home Agent shared secret. You may retain the value presently in the mobile, enter a new value in hexadecimal (up to 16 bytes), or enter a new value as text (up to 16 ASCII characters).
AAA Shared Secret	Authentication Authorization Accounting shared secret. You may retain the present value or change it as with HA Shared Secret.
MN-HA SPI	Mobile Node – Home Agent Security Parameter Index. Enter a hexadecimal number or leave blank to leave the SPI unset.
MN-AAA SPI	Mobile Node – Authentication Authorization Accounting Security Parameter Index. Same data entry as MN-HA SPI.
Rev Tunnel Preferred	Enables reverse tunneling preference.
Home address	Home IP address.
Primary HA address	Primary Home Agent IP address, 0.0.0.0 = dynamic, 255.255.255.255 = not set.
Secondary HA address	Secondary Home Agent IP address, uses same two reserved values as Primary HA address.
OK	Click OK to complete adding or changing this profile.
Cancel	Click CANCEL to abort adding or changing this profile.

4.17 Nonaccess stratum

Figure 4-19 depicts the Nonaccess Stratum (NAS) tab.

The screenshot shows the 'SURF5200-FDD, offline' window with the 'NAS' tab selected. The 'ESN' field displays '00000000'. The 'IMEI' section contains three input fields: 'TAC', 'FAC', and 'SNR'. To the right, the 'GSM A5 Algorithms Supported' section has seven checked checkboxes: A5-1, A5-2, A5-3, A5-4, A5-5, A5-6, and A5-7. Below these are three dropdown menus for 'UE RAT', 'GSM UE Op Class', and 'UMTS UE Op Class'. To the right of these are two input fields for 'UE SMS' and 'UE SM'. At the bottom of the window are five buttons: 'Read from Phone', 'Write to Phone', 'Exclusive Access', 'Load from File...', and 'Save to File...'.

Figure 4-19 NAS tab

The items displayed on the NAS tab are described in Table 4-21.

Table 4-21 NAS tab information

Setting	Description
TAC	IMEI's Type Approval Code, 6 digits
FAC	IMEI's Final Assembly Code, 2 digits
SNR	IMEI's Serial Number field, 6 digits
UE RAT	UEs Radio Access Technology, GSM only UMTs only, GSM and UMTS
GSM UE Op Class	GSM operating class for the UEC, class A, B, or C
UMTS UE Op Class	UMTS operating class for the UE, class A, B, or C
UE SMS	SMS value associated with the UE, 0-15
US SM	SM value associated with the UE, 0-15
GSM A5 Algorithms Supported	Which A5 algorithms the UE supports

5 Software Download

Software Download is the QPST client application used to:

- Download software to a phone from a QUALCOMM Phone Image (.HEX) file
- Back up and restore the NV memory in a QUALCOMM phone

To start Software Download, from the Start menu, select Programs→QPST→Software Download. The first window, as shown in Figure 5-1, appears.

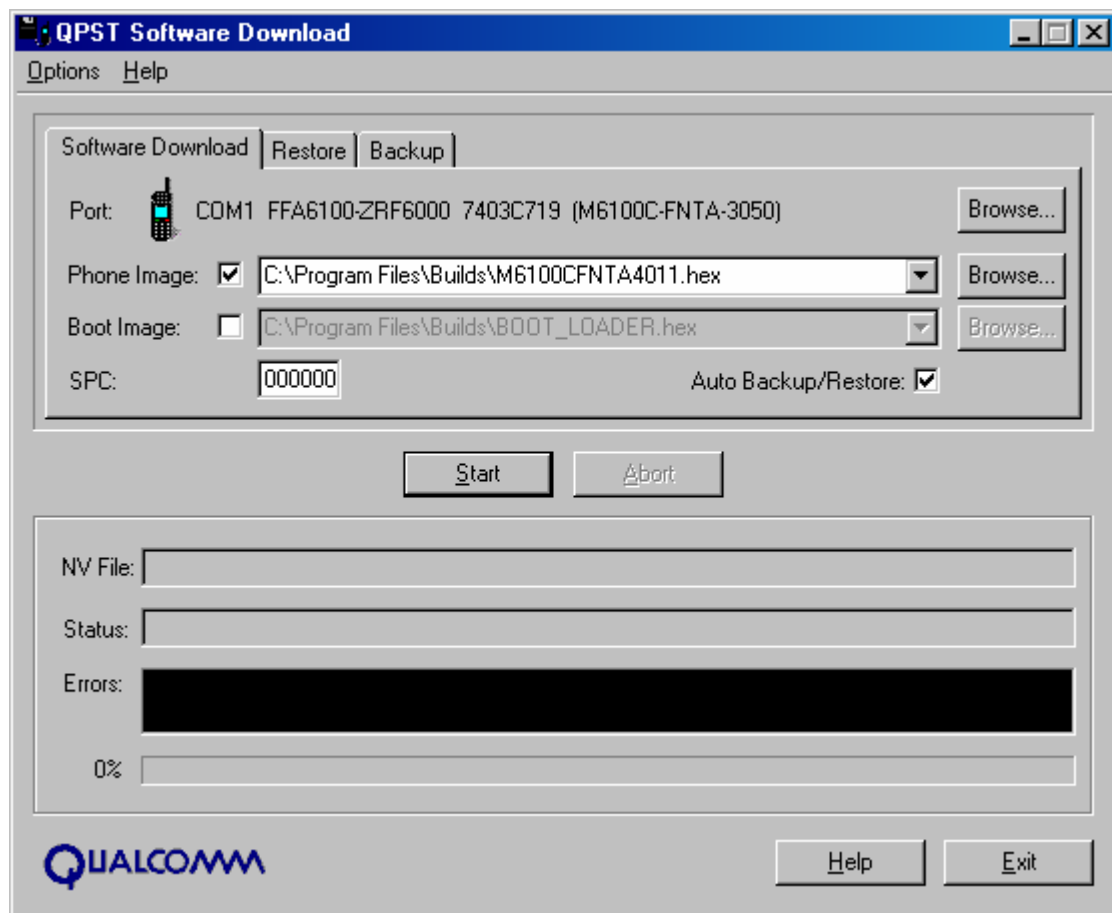


Figure 5-1 Software Download first window

5.1 Downloading a file

The Software Download application lets you select a phone connected to your PC, select a file to download into the phone, enter the phone's Service Programming Code (SPC), and monitor the status of your download session in the lower portion of the window.

5.1.1 Selecting a phone

To select a phone to download to:

1. Click **Browse** located next to the Port description in the Software Download tab to display the Select Port dialog, as shown in Figure 5-2.
2. Click to select the phone to which you want to download software.
3. Click OK.

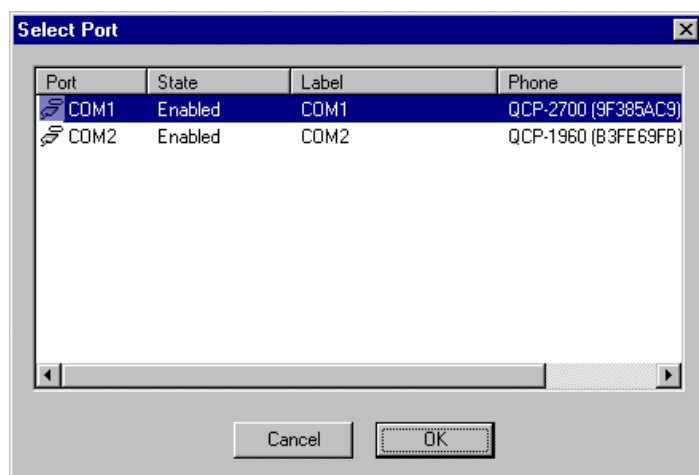


Figure 5-2 Select Port dialog

5.1.2 Selecting a file to download

Software Download can send the boot image (for phones that use a NAND Flash device), the phone image, or both images to the phone. Use the check boxes to the right of Phone Image or Boot Image to choose which types of files to download.

You can specify the name of an image file in several ways:

- Type a path and filename in the filename control.
- Click BROWSE to search for a file. You will use the dialog shown in Figure 5-3 to locate the file to download.
- Drag and drop a file from Windows Explorer to the filename control.
- Select a filename from the filename control's history list.

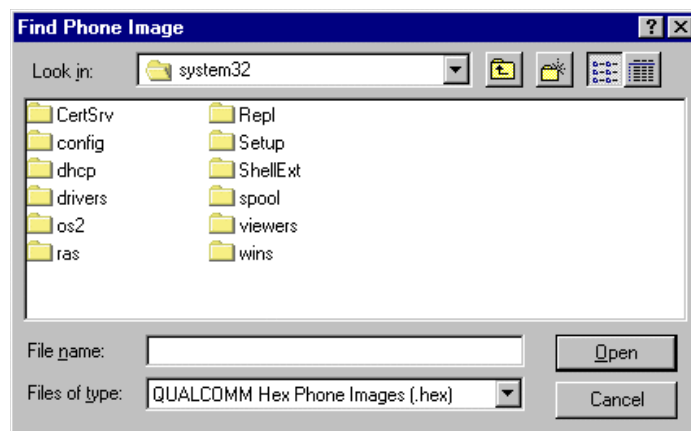


Figure 5-3 Find Phone Image dialog

5.1.3 Starting the download

To start the download:

1. Type the SPC for the selected phone in the SPC box.
2. Click START. You will see the progress of the download in the lower portion of the QPST Software Download window.

To stop the process at any time, click ABORT.

NOTE The Auto Backup/Restore check box provides the ability to skip the NV memory save and restore steps. By default this option is enabled, and the phone's NV items are backed up to a file before download and restored afterwards. *Disable this option only if you want the phone's NV memory to be erased after the download.* The phone will not function properly with its NV memory erased.

5.2 Saving and restoring NV memory

Items in a phone's NV memory are backed up automatically during the download process if the Auto Backup/Restore check box is checked. You can also save and restore them manually. The Backup and Restore tabs let you select files for backing up or restoring phone settings.

5.2.1 Backing up NV items

To back up a phone's NV memory:

1. Click the Backup tab to access the backup options.
2. Click BROWSE located next to the Port description, select the target phone from the resulting Select Port dialog, and click OK.
3. Click BROWSE located next to the QCN File box, use the resulting Find Phone Memory File dialog to specify the file in which to save the backup, and click OK.
4. Type the SPC for the selected phone into the SPC box.
5. Click START. You will see the progress of your backup in the lower portion of the dialog.

To stop the backup at any time, click ABORT.

5.2.2 Restoring NV items

To restore a phone's NV memory from a backup (QCN) file:

1. Click the Restore tab to access the restore options.
2. Click BROWSE located next to the Port description, select the target phone from the resulting Select Port dialog, and click OK.
3. Click BROWSE located next to the QCN File box, use the resulting Find Phone Memory File dialog to specify the backup file to restore, and click OK.
4. Type the SPC for the selected phone into the SPC box.
5. Click START. You will see the progress of the restore process in the lower portion of the dialog.

To stop the restore process at any time, click ABORT.

5.3 Changing Software Download settings

From the Options menu, select Settings. The Software Download Settings dialog appears, containing a text box for specifying an NV Backup Directory, as shown in Figure 5-4.

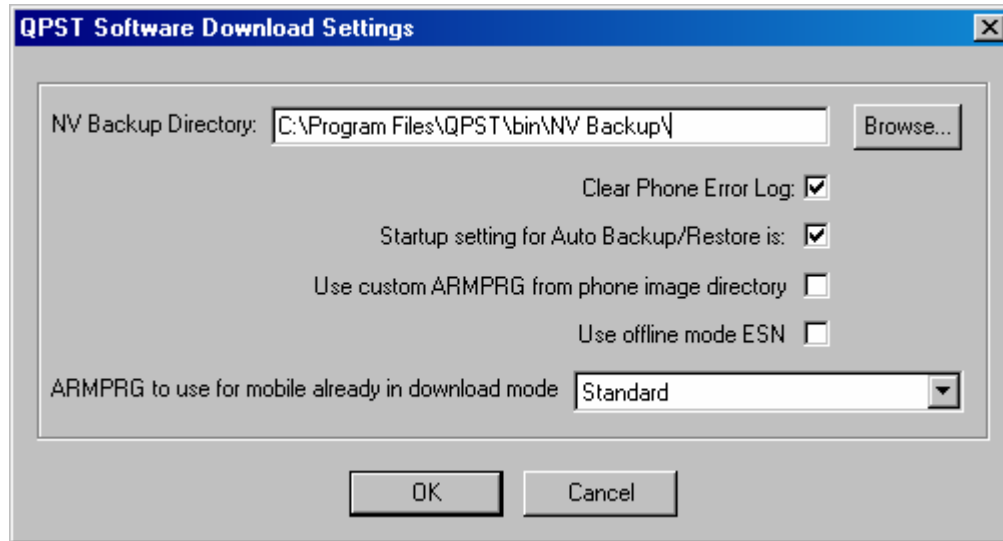


Figure 5-4 Software Download Settings dialog

This dialog lets you specify where to write the files that the Software Download application uses to back up NV items during downloads.

To change the directory used for this purpose:

1. Click BROWSE.
2. Select an alternate directory from the resulting dialog.
3. Click OK to accept your change.

The Clear Phone Error Log check box on this dialog indicates whether the phone's error log is cleared at the conclusion of a download. This option is enabled by default. To disable it and keep the phone's error log contents after a download, clear this check box before clicking OK.

The "Startup setting for Auto Backup/Restore is:" check box allows you to select the default value for Auto Backup/Restore. When the Software Download application starts, it will use this as the initial setting for Auto Backup/Restore on the Software Download tab.

QUALCOMM ships several boot loader programs (ARMPRG) with QPST. The Software Download application will select one to use based on the mobile's model number. To bypass automatic selection place a custom version named armprg.hex in the same folder as the file you wish to download, and select "Use custom ARMPRG from phone image directory."

Software Download cannot determine which ARMPRG to use for a mobile already in download mode. Prior to starting a download to a mobile in this state, select the type of MSM™ (Mobile

1 Station Modem) the mobile uses in the selection box next to “ARMPRG to use for mobile already
2 in download mode.”

3 Software Download will name the NV backup file based on the ESN of the phone. For phones
4 that use an R-UIM card, the ESN will come from the card. To bypass this and use the ESN from
5 the phone’s NV memory, select the “Use offline mode ESN” check box.

6

6 RF NV Manager GUI Application

This chapter provides information on how to use the application to manage RF NV items in a phone. The RF NV Manager GUI is an application used to control a QUALCOMM phone such as a SURF or FFA. This application requires DMSS or AMSS software.

NOTE RF NV Manager GUI only manages the RF-related NV items. All other nonRF-related NV items are discarded by the software.

6.1 Starting the program

To start the program, from the Start menu, select Programs→QPST→RF NV Manager Application. The RF NV Manager window, as shown in Figure 6-1, appears.

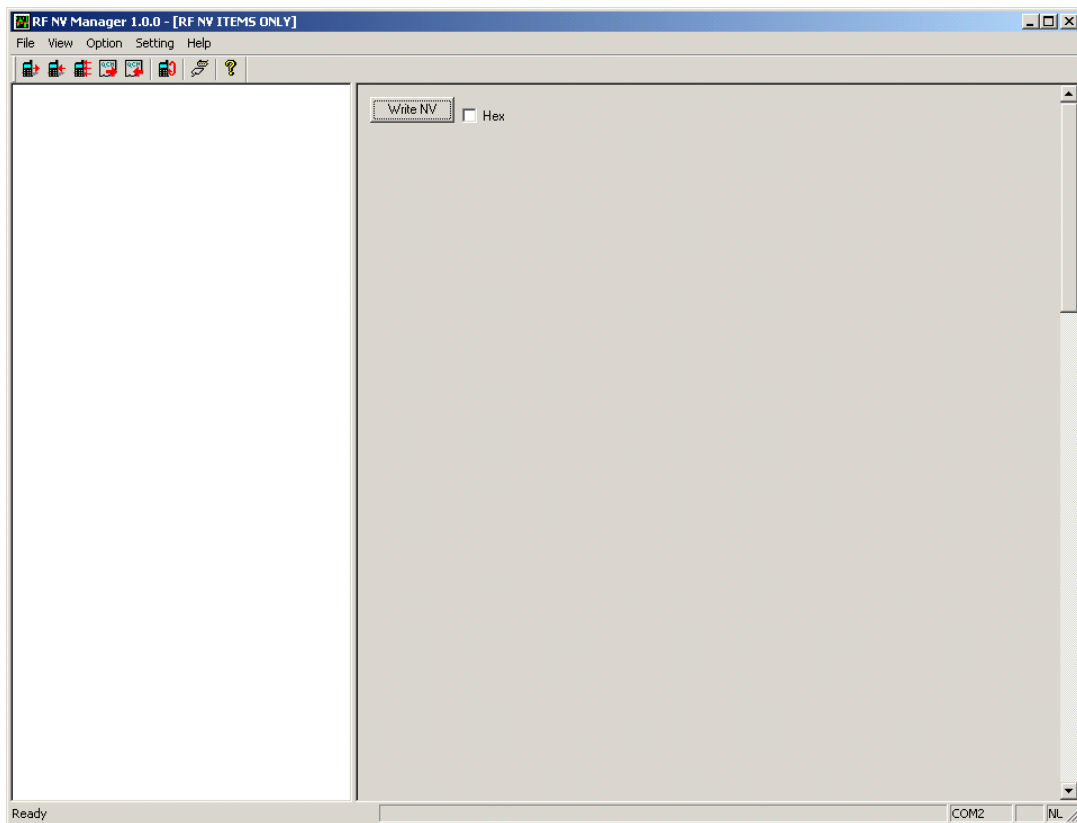


Figure 6-1 RF NV Manager window

The window consists of:

- Left pane – displays a view of active NV items
- Right pane – displays a view of the definition for the selected NV item
- Menu options – File, View, Option, Setting, and Help, which are described in the following sections
- Toolbar buttons – toolbar buttons are described in Section 6.2; when you point your cursor to the icons, help text will display

6.2 File menu

The File menu is shown in Figure 6-2.

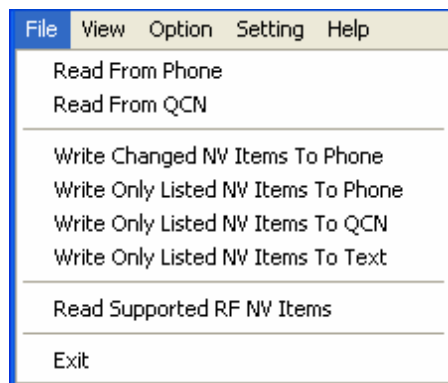


Figure 6-2 RF NV Manager File menu

You can also select the File menu options from the RF NV Manager window toolbar, shown in Figure 6-3. Table 6-1 lists general descriptions of available buttons.

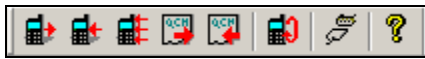


Figure 6-3 RF NV Manager window toolbar

Table 6-1 RF NV Manager window toolbar buttons

Icon	Description
	Read from phone
	Read from QNC
	Write changed NV items to phone
	Write only listed NV items to phone
	Write only listed NV items to QCN

6.2.1 Read from phone

The Read From Phone option reads all active NV items from the target. The unsupported or inactive NV items will not be displayed in the list of NV items. If the QPST Server is not launched at the press of this operation, the RF NV Manager launches the QPST Server automatically.

Once the operation is successfully finished, the active NV items are displayed in the left pane, as shown in Figure 6-4.

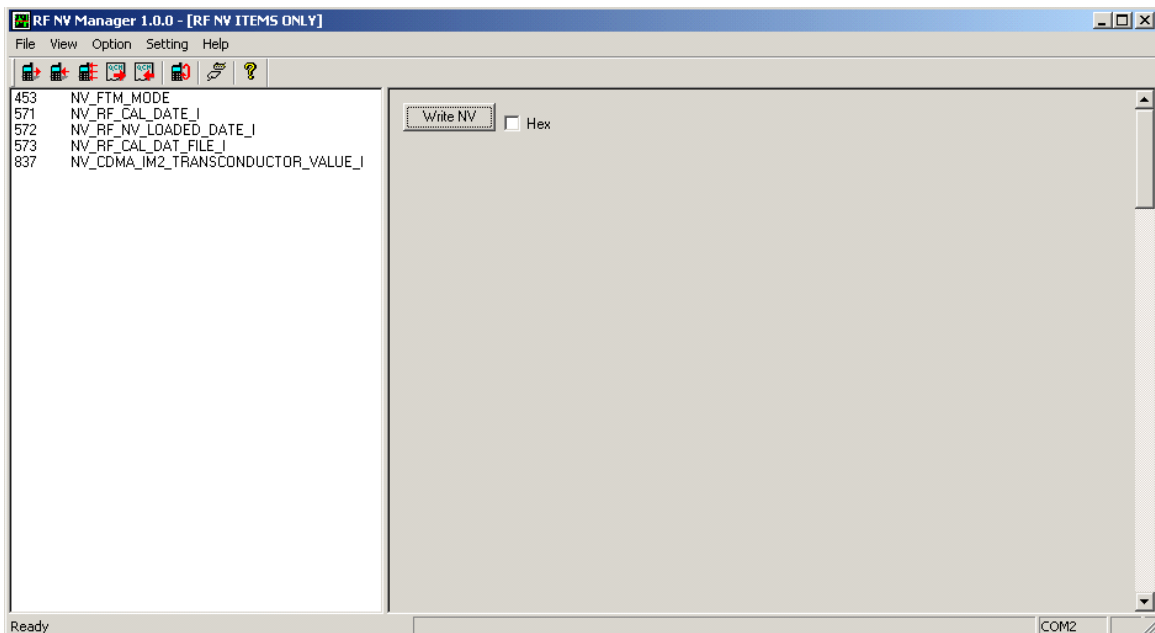


Figure 6-4 RF NV Manager active NV items

To modify or view the NV item, select the NV items from the left pane, and the corresponding data will be displayed in the right pane, as shown Figure 6-5.

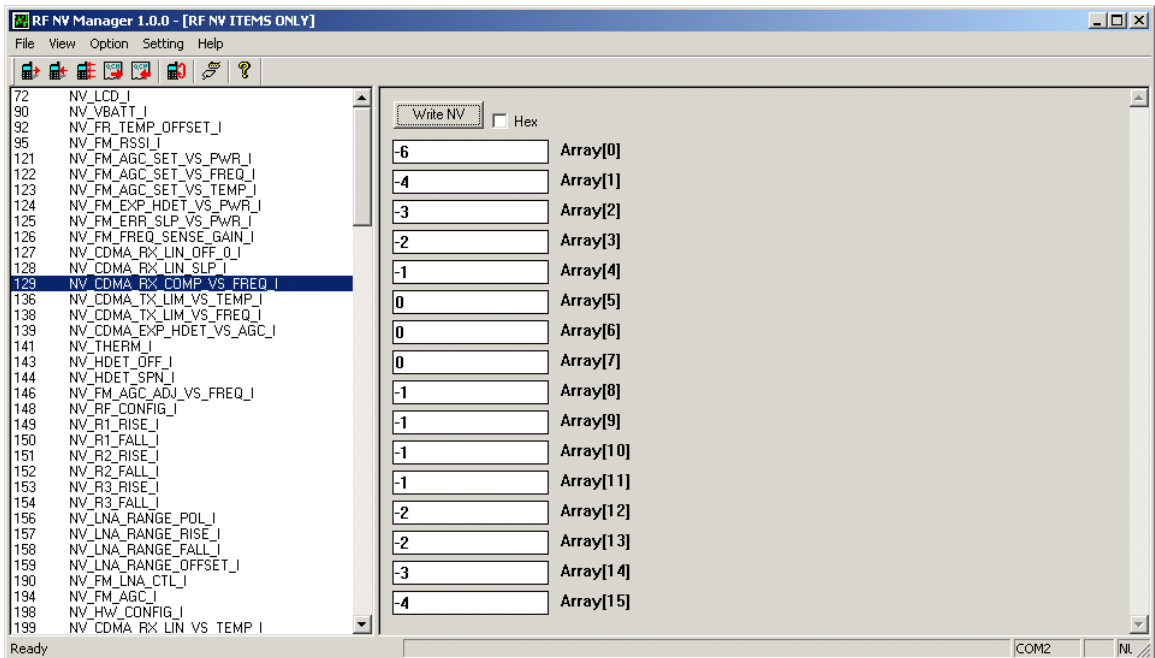


Figure 6-5 RF NV Manager active NV item corresponding data

6.2.2 Read from QCN

The RF NV Manager has the ability to read a QCN file and display all the RF-related NV items in that QCN file.

Select the Read From QCN option to launch the operation. A browse window will prompt you for the desired QCN file to open, as shown in Figure 6-6. Once the file is open, the corresponding NV items will be displayed in the left pane of the RF NV Manager window.

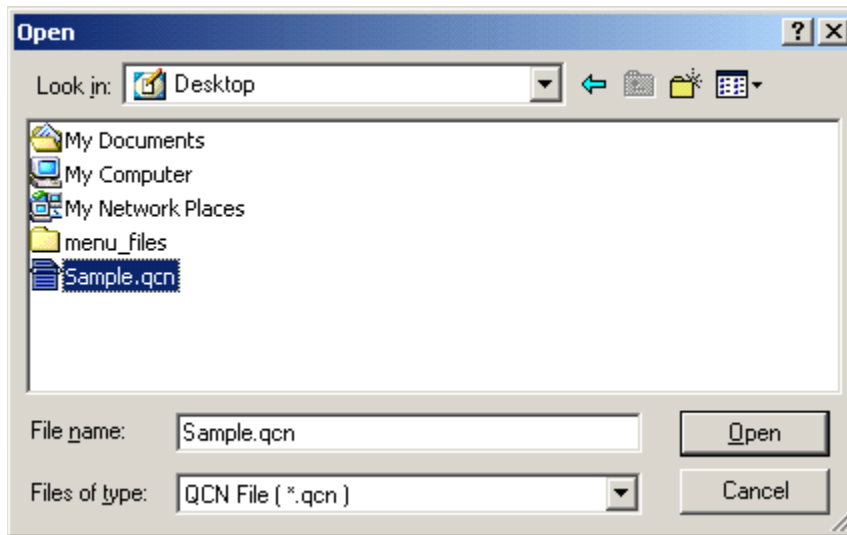


Figure 6-6 RF NV Manager open prompt for read from QCN

6.2.3 Write changed NV items to phone

The RF NV Manager keeps track of the user-modified NV items. This operation writes the user-modified NV items to the phone only.

6.2.4 Write only listed NV items to phone

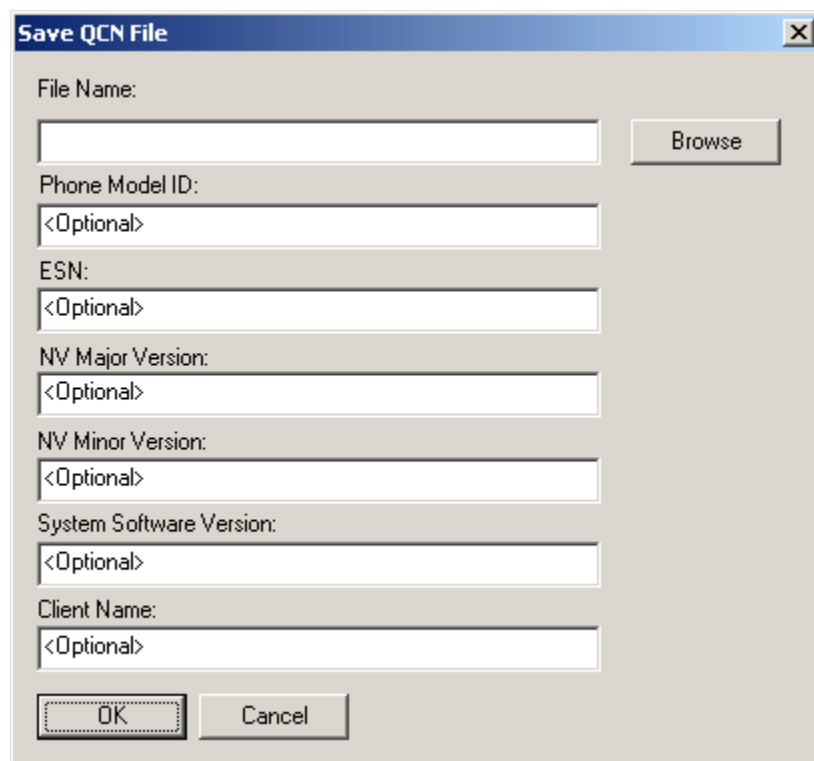
This operation writes all listed NV items to the phone. If the listed NV items have no data inside, the RF NV Manager will write to the phone with data 0.

6.2.5 Write only listed NV items to QCN

This operation writes all listed NV items to a user-defined QCN file.

NOTE The RF NV Manager only manages the RF-related NV items. Therefore, the QCN files that are created using this application only contain the RF-related NV items. To obtain a QCN file that contains all NV items (nonRF-related included), use Software Download to get such a file.

Once the operation is selected, a dialog box is launched for the information regarding the QCN file, as shown Figure 6-7. The fields identified as <Optional> are not required for user input.



The image shows a Windows-style dialog box titled "Save QCN File". It contains several input fields and buttons. The "File Name:" field is at the top, followed by a "Browse" button. Below this are five optional fields, each labeled and containing the text "<Optional>": "Phone Model ID:", "ESN:", "NV Major Version:", "NV Minor Version:", and "System Software Version:". At the bottom is the "Client Name:" field, also containing "<Optional>". At the very bottom are "OK" and "Cancel" buttons. The "OK" button is highlighted with a dashed border.

Figure 6-7 RF NV Manager write only listed NV items to QCN

6.2.6 Write only listed NV items to text

Select this option from the File menu. This option exports all the listed NV items to a text file that you have specified. The format of the text file is shown in Figure 6-8. The format consists of the NV item name (shown as first lines in the examples) and NV item values (shown as second lines in the examples).

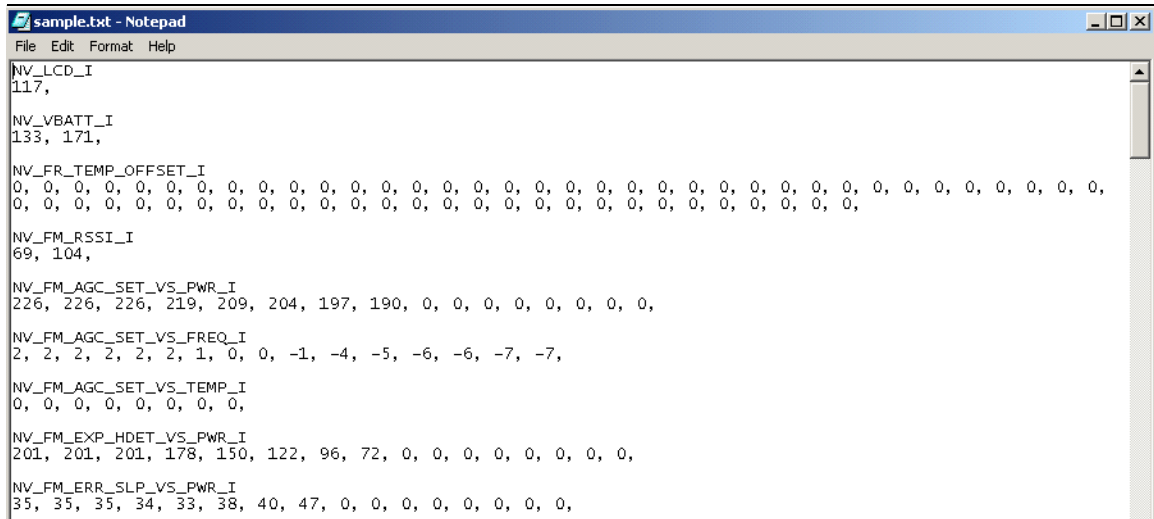


Figure 6-8 RF NV Manager write only listed NV items to text

6.2.7 Read supported RF NV items

Select this option from the File menu. This option displays all the RF NV items that the RF NV Manager GUI supports, despite the status of the target. Therefore, the list may also contain inactive and unsupported NV items depending on targets. This list can be different depending on the software version.

6.2.8 Exit

Select this option from the File menu to exit the program.

6.3 View menu

The view menu consists of the Sort and Search options.

6.3.1 Sort

The Sort option, shown in Figure 6-9, provides the capabilities to sort the list of NV items based on the ID number or in an alphabetical order.

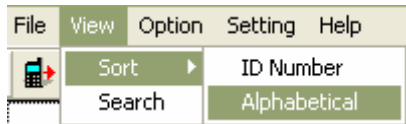


Figure 6-9 RF NV Manager view menu – sort

6.3.2 Search

The Search option, shown in Figure 6-10, provides the capability to find the closest NV item from the current list.



Figure 6-10 RF NV Manager view menu – search

Once the Search option is selected, a dialog box appears prompting for search requirements, as shown in Figure 6-11.

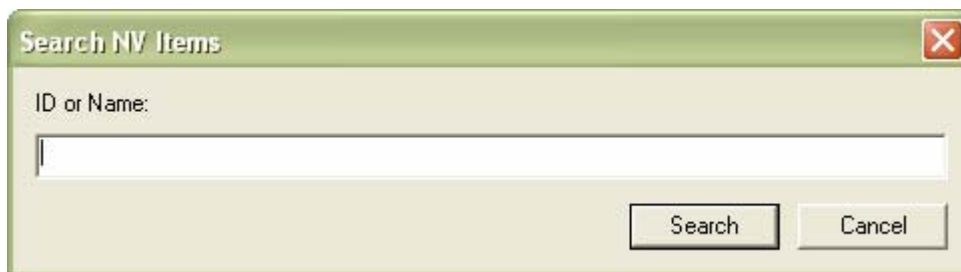


Figure 6-11 RF NV Manager view menu – search dialog

6.4 Option menu

The Option menu, shown in Figure 6-12, is described in the following subsections.

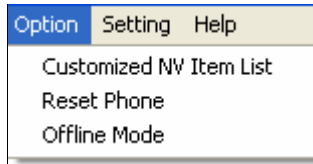


Figure 6-12 RF NV Manager Option menu

6.4.1 Customized NV item list

This option provides the capability to create a user-defined list of NV items, as shown in Figure 6-13.

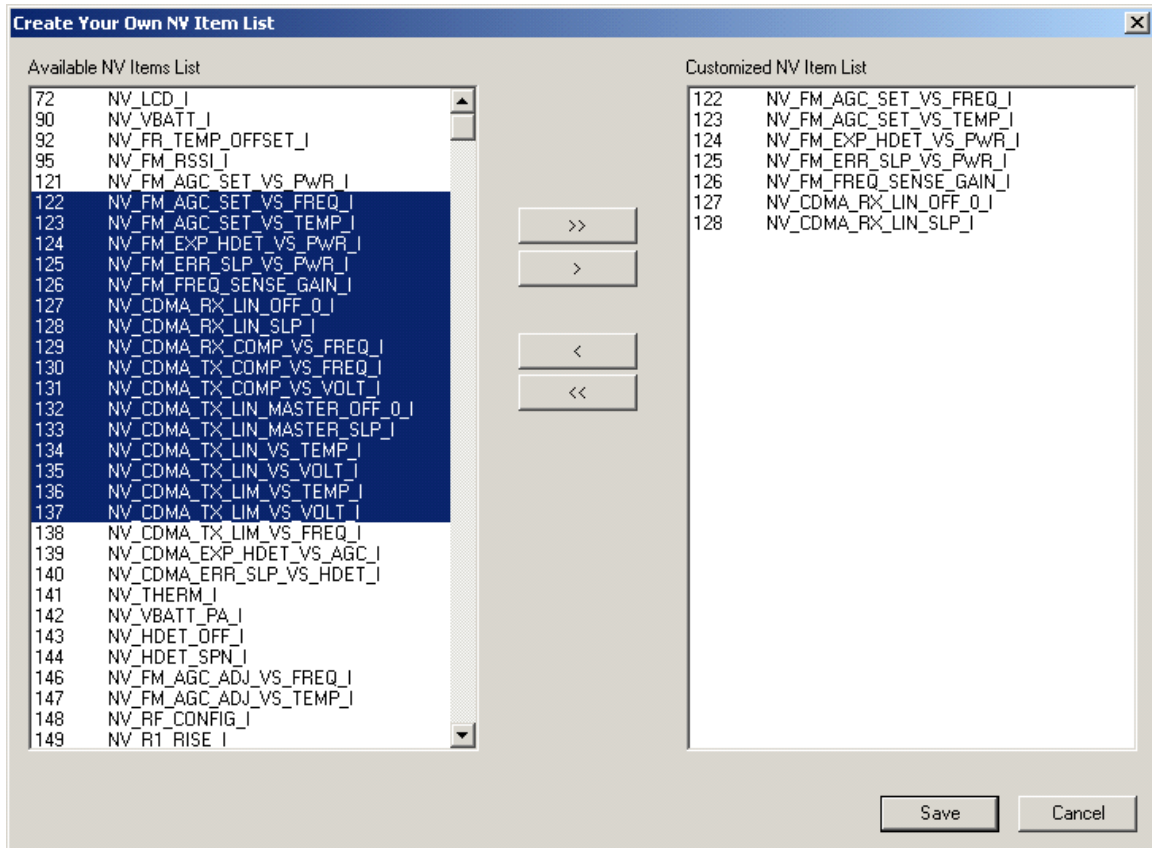
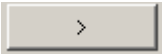
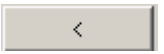
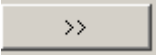


Figure 6-13 RF NV Manager option menu customized NV item list

Table 6-2 describes the buttons used to manage the list.

Table 6-2 RF NV Manager customized NV item list buttons

Button	Description
	Add one or multiple NV items to the current NV list
	Remove one or multiple NV items from the current NV list
	Add all supported NV items to the current NV list
	Remove all from the current NV list

6.4.2 Reset phone

This option provides a soft reset of the target.

6.4.3 Offline mode

This option switches the target to Offline mode.

6.5 Setting menu – comport

The Setting menu consists of the Comport, as shown in Figure 6-14.



Figure 6-14 RF NV Manager setting menu

This option configures the comport setting, as shown in Figure 6-15.

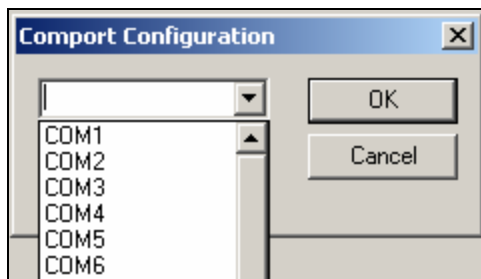


Figure 6-15 RF NV Manager setting menu comport

6.6 Help menu

The Help menu contains the software version of the RF NV Manager and copyright information.

7 EFS Explorer

The EFS Explorer application lets you navigate the embedded file system (EFS) of phones that support EFS. It is similar in function to the Windows Explorer program on a PC.

To start EFS Explorer, from the Start menu, select Programs→QPST→EFS Explorer.

7.1 EFS Explorer toolbar

The EFS Explorer application provides a toolbar that gives you quick access to functions that are available on the application’s File and Phone menus, as shown in Figure 7-1.



Figure 7-1 EFS Explorer toolbar

Descriptions of the toolbar buttons are provided in Table 7-1.

Table 7-1 EFS Explorer toolbar buttons

Button	Function
	Displays the Phone Selection dialog, which allows you to select a phone for reading or writing NV items.
	Requests an exclusive lock on the connected phone so that no other users or applications can access it.
	Refreshes the current view of the phone's EFS.
	Navigates to the parent directory of the current directory.
	Displays the Options dialog used to set EFS Explorer preferences.
	Displays information about the EFS Explorer application.

7.2 Selecting a phone

When EFS Explorer launches, it displays a Phone Selection dialog that lists the phones currently being monitored by the QPST server, as shown in Figure 7-2.

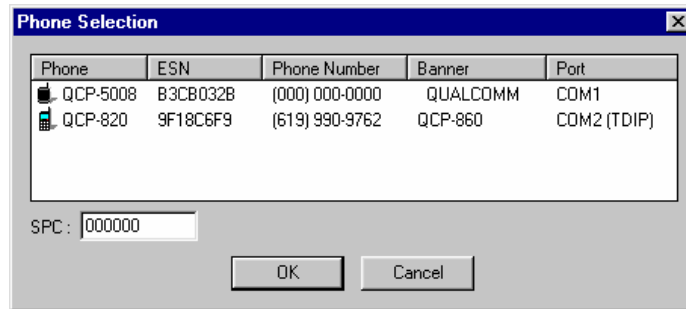


Figure 7-2 EFS Phone Selection dialog

To select a phone to explore:

1. Click to select it from the list of connected phones.
2. Type an SPC value in the SPC field.
3. Click OK.

When you click OK, the EFS Explorer window appears, showing the top, or root, level of the phone's EFS.

You can change the connected phone anytime by select Connect from the Phone menu to reaccess the Phone Selection dialog, as shown in Figure 7-3.

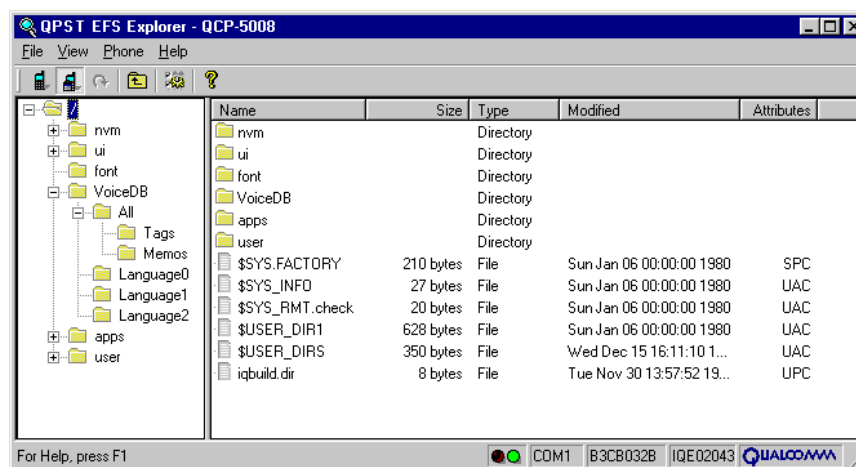


Figure 7-3 EFS Explorer application window

The application's status bar at the bottom of the window displays the COM port, ESN, and software build of the connected phone. In Figure 7-3, the build number is IQE02043.

The red/green status indicators to the left of the COM port information report the phone's "readiness." For example, if the phone is reset, the indicator will appear red, and then green again when the phone comes back online.

As with other QPST applications, you can lock the phone for exclusive access .

You can navigate in the application by using the mouse or keyboard just as you would in any other Windows application directory window.

The EFS Explorer window is divided into two panes:

- The left pane contains an expandable directory tree.
- When you select a folder in the directory tree, a listing of subfolders and files within that folder appears in the right pane.

To move files within the EFS Explorer, you can select one or more files and drag them to another directory.

To copy the files, hold down Ctrl when dropping the files just as you would in any other Windows Explorer application. You can drop the files into a folder in the tree pane (on the left) or the list pane (on the right). A directory in the tree pane that has subdirectories will automatically expand when you drag the mouse over it.

NOTE You can only drag files, not directories.

You can choose different display types for the file list (large icons, small icons, list, or detailed list) from the View menu. To sort the detail (Name, Size, Type, and so on), click the heading of the column by which you want the list sorted. Clicking the column heading toggles between ascending and descending order.

To refresh the current list, press F5.

7.3 Creating a directory

When you create a directory in the phone's EFS, the directory is created on the phone and the file structure list is refreshed.

To create a directory:

1. Navigate to the location where you want to create a new directory.
2. From the File menu, select New→Directory. The Create Directory dialog, as shown in Figure 7-4, appears.

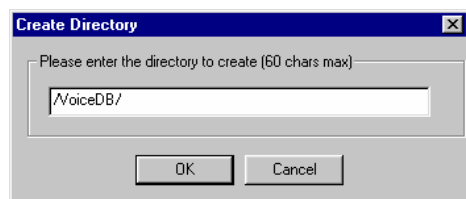


Figure 7-4 EFS Create Directory dialog

3. Type a name for the file in the field.
4. Click OK.

7.4 Copying a file to the phone

When you create a new file in the phone's EFS, you can specify a local or network file to copy to the phone and specify the creation date and attribute information.

To create a new file:

1. Navigate to the location where you want to create a new file.
2. From the File menu, select New→File. The Write File to Phone dialog as shown in Figure 7-5 appears.



Figure 7-5 Write File to Phone dialog

3. In the file selection field, do one of the following:
 - ❑ Type the fully qualified name of the file on your local PC or network server that you want to copy to the phone.
 - ❑ Click BROWSE and navigate to the file.
4. If needed, edit the file path and name that is displayed in the path/filename field.
5. Select Overwrite, Attribute, and Creation Date options as needed.
6. Click OK.

You can also copy files to the phone by dragging. You can drag a file from any Windows folder and drop it into the desired location in the EFS Explorer in either the directory tree or file listing display. Remember that you can only drag files, not directories.

7.5 Copying a file from the phone

When you copy a file from the phone's EFS, you are prompted to specify the destination path (local or network) for that file.

To copy a file from the phone:

1. Select the file to be copied.
2. From the File menu, select Copy from Phone. The Copy File from Phone dialog, as shown in Figure 7-6 appears.



Figure 7-6 Copy File from Phone dialog

3. In the field, if the destination directory is different from the directory that is displayed, do one of the following:
 - Type the fully qualified name of the destination directory.
 - Click BROWSE and navigate to the destination directory.
4. Click OK. The selected file is copied from the phone to the location that you specified.

7.6 Opening a file

To view a file listed in the EFS Explorer, do one of the following:

- Double-click the file.
- Click the file and then select File→Open.

When you do this, the file on the phone is copied temporarily to your PC, and the default viewer that is associated with that file type is launched. If no viewer is associated with the file, the Windows Open With dialog appears, prompting you to specify an application. The temporary files are deleted automatically when the application closes.

7.7 Viewing or changing file properties

To view the current properties of a file or modify them, select File→Properties. In the displayed File Attributes dialog, shown in Figure 7-7, you can change the file's properties as needed. Click OK when finished.

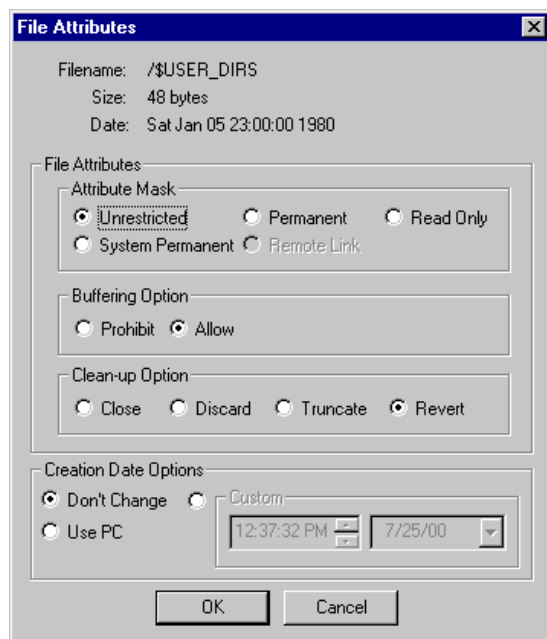


Figure 7-7 File Attributes dialog

7.8 Deleting files or directories

The EFS Explorer application lets you delete files and directories. Directories containing files or subdirectories can also be deleted.

To delete a file or directory, do one of the following:

- Right-click the file or directory to be deleted, then click **DELETE** from the displayed menu.
- Click the file, then choose File→Delete.
- Click the file, then press **DELETE** on the keyboard.

Then, respond to the prompt in the warning dialog that is displayed.

7.9 Setting EFS Explorer preferences

You can adjust some program preferences by selecting Edit→Preferences or by selecting the appropriate toolbar icon. The EFS Explorer Options dialog appears. Figure 7-8 depicts the Operations tab dialog.

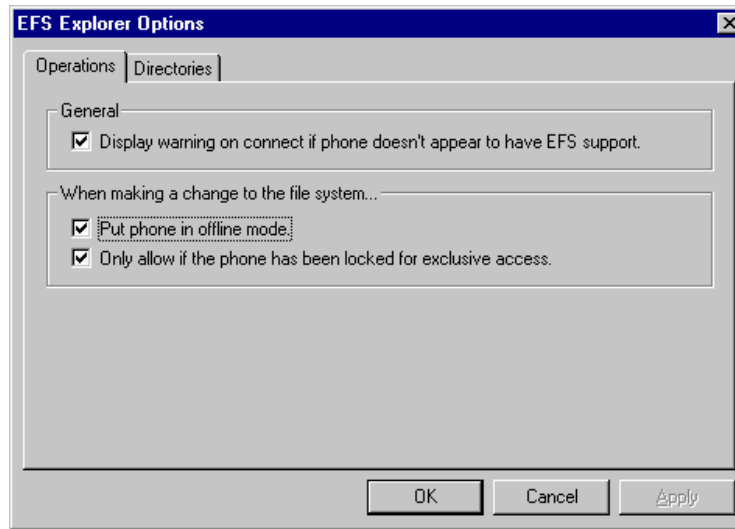


Figure 7-8 EFS Explorer Options Operations tab dialog

The Operations tab in this dialog enables you to specify the preferences described in Table 7-2.

Table 7-2 EFS Explorer Options Operations tab information

Option	Description	Default
Display a warning	When selected, displays a warning dialog if the phone you select for exploring does not have EFS support.	Selected
Offline mode	When selected, takes the phone offline before attempting operations that will modify the file system of the phone.	Selected
Exclusive only	When selected, allows file system operations only if the EFS Explorer application has an exclusive lock on the phone. Note: Unlike the other preferences, this setting is reset to the default whenever you close the EFS Explorer.	Selected

Figure 7-9 depicts the Directories tab dialog.

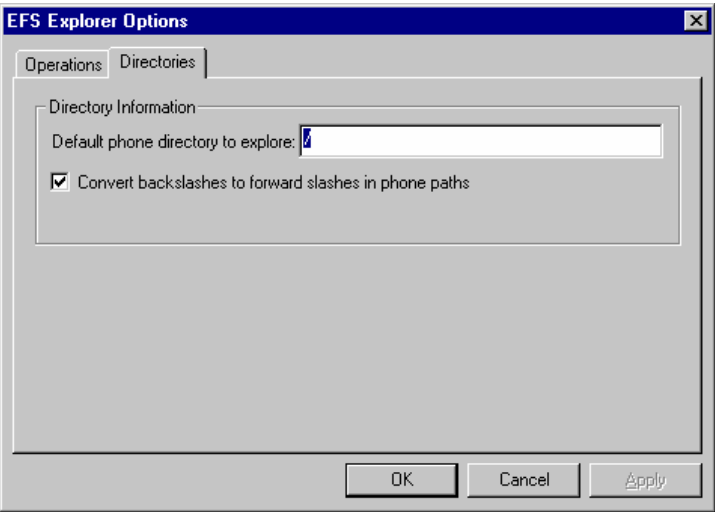


Figure 7-9 EFS Explorer Options Directories tab dialog

The Directories tab dialog enables you to specify the preferences described in Table 7-3.

Table 7-3 EFS Explorer Options: Directories tab information

Option	Description	Default
Default directory	Default directory when exploring will begin.	/
Convert backslashes	When selected, backslashes (\) will be converted automatically to forward slashes (/) for paths that you specify.	Selected

8 QCNView

QCNView is a standalone utility for viewing QCN files, which are used by various QPST utilities such as Software Download and Service Programming for backing up and restoring a phone's NV memory.

To start QCNView, from the Start menu, select Programs→QPST→QCNView.

To view a QCN file, choose File→Open and navigate to the file you want to view. You can open as many QCN files as needed. Each open file will be displayed in a separate window in QCNView, with tabs for Tree View and Text View, as shown in Figure 8-1 and Figure 8-2.

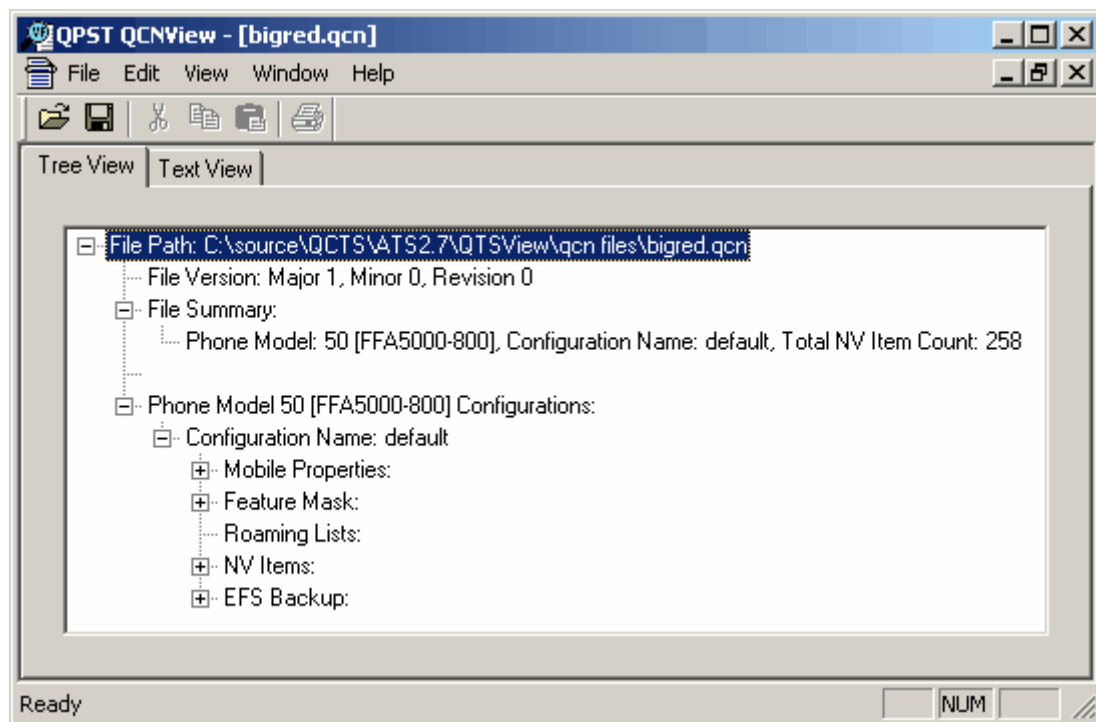


Figure 8-1 QCNView tree view

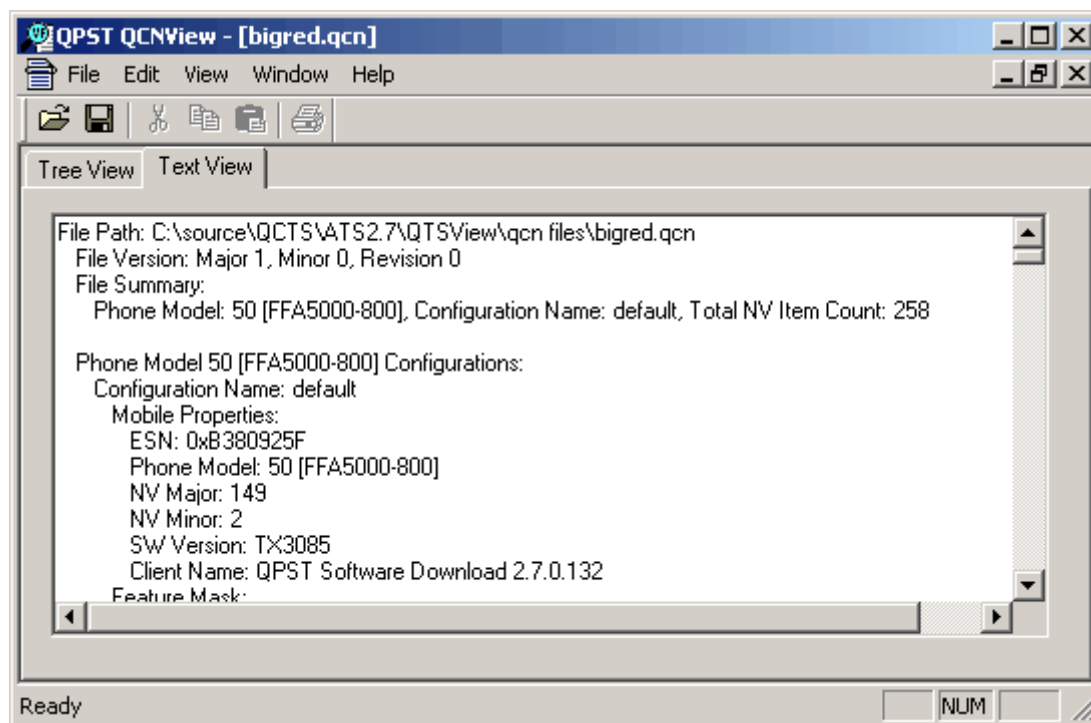


Figure 8-2 QCNView text view

In the Tree View tab, you can expand or collapse sections of the tree to display the information of interest to you.

In the Text View tab, you can select a range of text (or select all via Edit→Select All), copy the information to the clipboard, and then paste it into a document in another application. You can change the font of the Text View tab by choosing Edit→Font. You can save a text-only copy of the file by choosing File→Save As.

QCNView also supports command line usage for saving a text-only copy of a file. To do this, invoke QCNView from a command prompt with the switch `-s`, an input file path, and an output file path. For example, to generate an ASCII text file named “outfile.txt” from a binary file named “infile.qcn”:

```
C:\>QCNView.exe -s infile.qcn outfile.txt
```

9 Roaming List Editor

The Roaming List Editor is a standalone utility that displays a phone's roaming protocol information. You may use this tool to edit an existing roaming list file, create a new roaming list, or print the contents of a roaming list.

To start Roaming List Editor, from the Start menu, select Programs→QPST→RL Editor.

9.1 Operating modes

Roaming List Editor operating modes consist of Edit, Text View, and Command Line, which are described in detail in this chapter.

The Roaming List Editor has two user interface modes:

- Edit mode
- Text View mode

Roaming List Editor always begins in Edit mode. All roaming list creation and modification occurs in Edit mode. Text View mode presents a roaming list file formatted entirely as text. You can see a file in Text View mode by clicking the Text View icon on the toolbar. You can save from Text View mode into an ASCII text file (as opposed to the standard binary roaming list file). You can subsequently reopen the ASCII file with the Roaming List Editor and work with it exactly as you would a standard binary file.

NOTE If you click the Text View icon before entering all required information in the Edit mode window, a warning appears notifying you of the first field where an entry is missing or incorrect. You must correct all errors before using Text View mode.

Roaming List Editor also supports a third mode, Command Line mode. This mode is useful when specific commands need to be applied to a roaming list file without any user interaction.

9.2 Edit mode

Roaming List Editor opens in Edit mode with a new empty roaming list file displayed. You can then open or create additional roaming lists using the File menu.

The Edit mode window is divided into three areas:

- Properties – see Section 9.2.1
- Acquisition Records – see Section 9.2.2
- System Records – see Section 9.2.3

The Edit mode of the Roaming List Editor is shown in Figure 9-1.

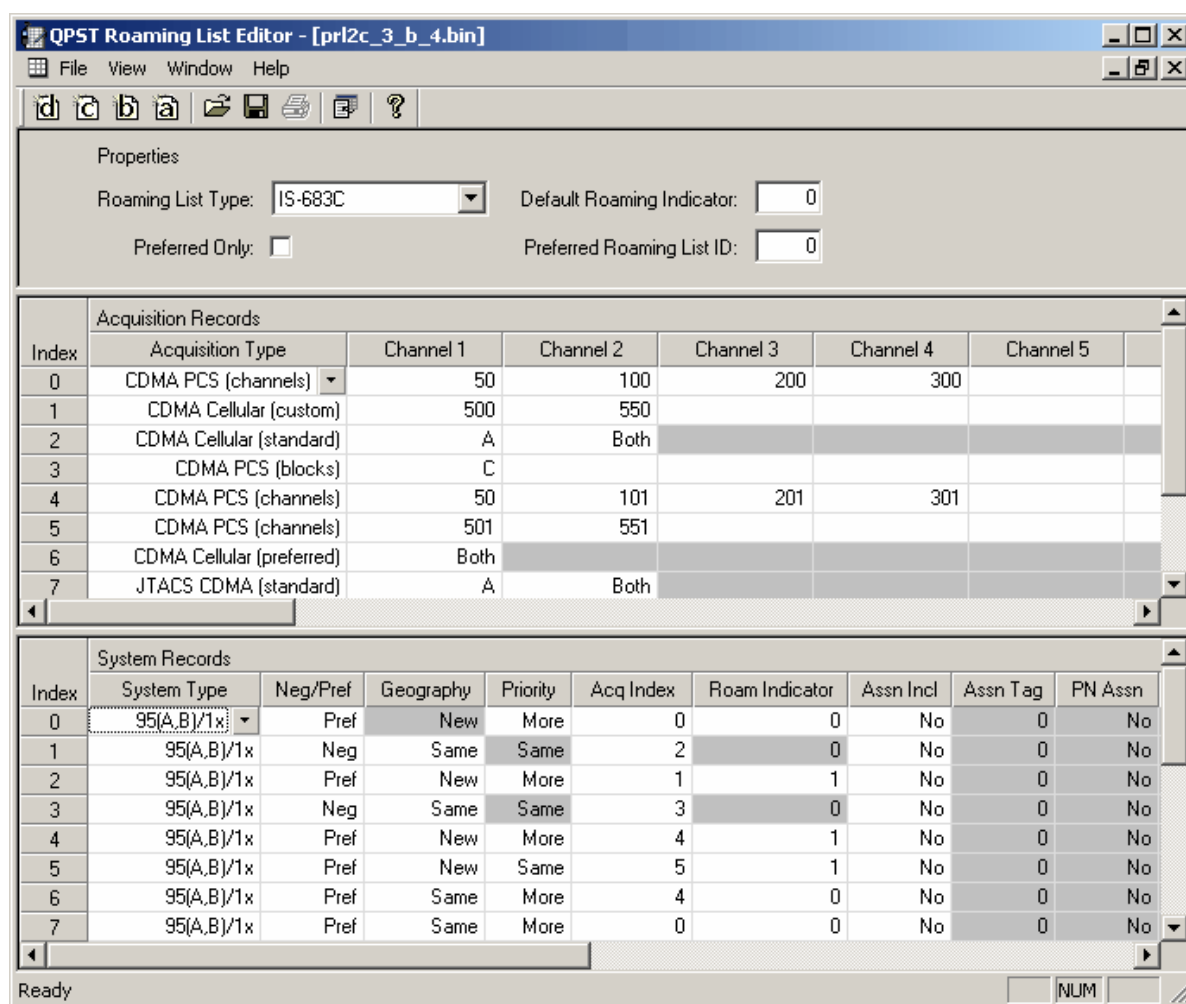


Figure 9-1 Roaming List Editor edit mode

9.2.1 Properties

The upper area of the Edit mode window defines roaming list properties. These include Roaming List Type, Preferred Only, Default Roaming Indicator, and Preferred Roaming List ID.

The Roaming List Editor supports four roaming list file types, IS-683A, IS-683B, IS-683C, and IS-683D. You can change the type by selecting from the Roaming List Type drop-down list in the Properties area. Changing from a newer standard to an older standard (D to C for example) may result in data loss if any records in the file apply only to the newer standard. The Roaming List Editor will display a warning before making such a conversion.

The Preferred Only check box specifies that System Records with the Neg/Pref field set to “Neg” are to be ignored.

The Default Roaming Indicator field specifies which roaming indicator is displayed by default. Each System Record can have its own Roaming Indicator setting as well.

The Preferred Roaming List ID field specifies the System Record index of the preferred roaming list.

9.2.2 Acquisition records

The middle area of the Edit mode window defines acquisition records for the roaming list.

An acquisition record contains parameters that the mobile station can use to acquire a system. Each type of acquisition record is tailored for use in acquiring a particular kind of system.

Select the acquisition record type from the drop-down list in the first field. Values for the other fields can then be filled in according to the acquisition type.

Create new acquisition records as needed (using the contextual menu, right-click and select Insert Record) to define settings for all desired acquisition types.

Note that the field titles at the top of the acquisition record table are updated according to the type of record that is currently selected.

The acquisition record table must contain at least one valid acquisition type definition.

9.2.2.1 Permissible entries

Roaming List Editor ensures that the value in each field of each acquisition record is valid for the selected acquisition type. Table 9-1 describes the permissible values in all types of acquisition records.

NOTE The “Roaming list format” column specifies the oldest format in which this acquisition type is available; for example, “A” means the acquisition type is available in IS-683A and higher; “C” means the acquisition type is available in IS-683C and higher.

1

Table 9-1 Permissible values in acquisition records

Acquisition type	Field	Permissible values	Roaming list format
Analog Cellular	System	Select A, B, or Both.	A
CDMA Cellular (standard)	System	Select A, B, or Both.	A
	Channel	Select Pri, Sec, or Both.	A
CDMA Cellular (custom)	Channel 1-32	Enter a channel value within the range 1 to 799, 801 to 1039, 1041 to 1199, or 1201 to 1600, inclusive. A minimum of one channel must be specified.	A
CDMA Cellular (preferred)	System	Select A, B, or Both.	A
CDMA PCS (blocks)	Block 1-6	Select A, B, C, D, E, F, or Any. A minimum of one block must be specified.	A
CDMA PCS (channels)	Channel 1-32	Enter a channel value within the range of 25 to 1175, inclusive. A minimum of one channel must be specified.	A
JTACS CDMA (standard)	System	Select A, B, or Both.	B
	Channel	Select Pri, Sec, or Both.	B
JTACS CDMA (custom)	Channel 1-32	Enter a channel value. A minimum of one channel must be specified.	B
2GHz Band (channel)	Channel 1-32	Enter a channel value. A minimum of one channel must be specified.	B
CDMA Generic	Note: A minimum of one band/channel pair must be specified.		
	Band 1-16	Select a band class from the menu – 800-MHz-Cellular, PCS, TACS, JTACS, Korean-PCS, NMT-450, IMT-2000, 700-MHz-Cellular.	C
	Channel 1-16	Enter a channel value for the selected band class.	C
HDR Generic	Note: A minimum of one band/channel pair must be specified.		
	Band 1-16	Select a band class from the menu – 800-MHz-Cellular, PCS, TACS, JTACS, Korean-PCS, NMT-450, IMT-2000, 700-MHz-Cellular.	C
	Channel 1-16	Enter a channel value for the selected band class.	C
GSM Generic	Band 1-32	Select a band class from the menu – GSM-450, GSM-480, GSM-750, GSM-850, P-GSM-900, E-GSM-900, R-GSM-900, DCS-1800, PCS-1900. A minimum of one band must be specified.	D
UMTS Generic	Note: A minimum of one band/UARFCN pair must be specified.		
	Band 1-16	Select a band class from the menu – 2.1GHz, 1.9GHz, 1.7GHz.	D
	UARFCN 1-16	Enter a UTRA Absolute Radio Frequency Channel Number, or leave blank to indicate that no UARFCN is included.	D

Acquisition type	Field	Permissible values	Roaming list format
GSM/UMTS Pref	Preferred System	Select GSM or UMTS.	D
GSM/UMTS Pref Generic	Note: A minimum of one system/band/UARFCN triplet must be specified.		
	System 1-10	Select a system from the menu – GSM, UMTS.	D
	Band 1-10	Select a band class from the menu. If system is GSM – GSM-450, GSM-480, GSM-750, GSM-850, P-GSM-900, E-GSM-900, R-GSM-900, DCS-1800, PCS-1900. If system is UMTS – 2.1GHz, 1.9GHz, 1.7GHz.	D
	UARFCN 1-10	If system is UMTS, enter a UTRA Absolute Radio Frequency Channel Number, or leave blank to indicate that no UARFCN is included.	D
Undefined	Data Length	Enter a value for the number of bytes of undefined data in the record. These bytes will all be set to 0.	D

9.2.2.2 Working with records

New Roaming List Editor files are created with a single acquisition record and system record, ready to be defined. Select the record type from the drop-down list, then specify values for the rest of the fields for that type as needed.

To add another record, right-click in the acquisition record or system record area of the window to display the contextual menu and select Insert Record. The new record will be inserted above the record you right-clicked, or at the end of the table if you did not click any record. Continue as before, selecting a type for the new record and entering values for all corresponding fields.

To delete a record from the table, right-click the record to display the contextual menu and select Delete Record.

To cut a record from the table and place it on the clipboard, right-click the record to display the contextual menu and select Cut Record.

To copy a record from the table and place it on the clipboard, right-click the record to display the contextual menu and select Copy Record.

To paste a record from the clipboard into the table, right-click in the acquisition record or system record area of the window to display the contextual menu and select Paste Record. The new record will be inserted above the record you right-clicked, or at the end of the table if you did not click any record.

NOTE The Delete, Cut, Copy, and Paste commands apply to the record level, not to individual fields within a record, even if only one field appears to be selected.

To delete entries or selections from individual fields, press DELETE.

9.2.3 System records

The lower area of the Edit mode window defines system records for the roaming list.

A system record contains parameters that the mobile station can use for identifying an acquired system, for determining whether an acquired system is the optimal system on which to operate, and for determining the mobile station's roaming status.

Select the system record type from the drop-down list in the first field. Values for the other fields can then be filled in according to the system type.

Create new system records as needed (using the contextual menu, right-click and select Insert Record) to define settings for all desired system types. Each system record must reference a valid acquisition record (using the Acquisition Index field). Multiple system records may reference the same acquisition record, but not all acquisition records need to be referenced by system records.

Note that the field titles at the top of the system record table are updated according to the type of record that is currently selected.

The system record table must contain at least one valid system type definition.

9.2.3.1 Permissible entries

Roaming List Editor ensures that the value in each field of each system record is valid for the selected system type. Table 9-2 describes the permissible values in all types of system records.

NOTE The “Roaming list format” column specifies the oldest format in which this system type is available; for example, “A” means the system type is available in IS-683A and higher; “C” means the system type is available in IS-683C and higher.

Table 9-2 Permissible values in system records

System type	Field	Permissible values	Roaming list format
Any	Neg/Pref	Select Pref or Neg. ■ Pref – mobile station is allowed to operate on the system associated with this record ■ Neg – mobile station is not allowed to operate on the system associated with this record	A
	Geography	Select New or Same. Same means the geographical region is the same as the previous system record. Note that the value of this field in the first system record is always New.	A
	Priority	Select Same or More. More means the system associated with this system record is more desirable than the system associated with the next system record. If this is the last system record in a geographical region, or if the Neg/Pref field in the next system record is Neg, this field has no meaning.	A

System type	Field	Permissible values	Roaming list format
Any (cont.)	Acq Index	Enter an acquisition index corresponding to the Index field in the acquisition table for the record associated with this system record. Note that multiple system records can reference the same acquisition record.	A
	Roam Indicator	Enter a roaming indicator value within the range 0 to 255, inclusive. Note that this value overrides the default setting in the Properties area.	A
	Assn Incl	Select No or Yes. Yes means this system record is part of a set that shares a PN offset assignment (colocated) or which can reach the same PSDN (associated), as specified by the following three fields, Assn Tag, PN Assn, Data Assn.	C
	Assn Tag	Enter a number that specifies the set to which this system record belongs. All of the system records in the same Geography with the same Assn Tag form a set.	C
	PN Assn	Select No or Yes. Yes means the system identified by this system record has the same PN assignment as other systems in the same Geography with the same Assn Tag and whose PN Assn field is also Yes.	C
	Data Assn	Select No or Yes. Yes means the system identified by this system record can reach the same set of PDSNs as other systems in the same Geography with the same Assn Tag and whose PN Assn field is also Yes.	C
95(A,B)/1x	SID	Enter a system ID value within the range 1 to 32767, or enter 0 to indicate a wildcard system ID.	A
	NID	Enter a network ID value within the range 0 to 65534, or enter 0 to indicate a wildcard network ID	A
IS-856	Subnet ID	Enter a subnet ID value formatted according to the IPV6 protocol—a 128-bit address composed of eight 16-bit values separated by colons followed by a slash and a length value within the range 0 to 127. Enter /0 to indicate a wildcard subnet ID. It is not necessary to specify leading zeros for a subfield, but there must be at least one numeral in every subfield. For example, 0000:0000:0000:0000:0000:0000:0100:0000/104 is equivalent to 0:0:0:0:0:0:100:0/104. Only the number of bits specified by the length are actually written to the roaming list file.	C

System type	Field	Permissible values	Roaming list format
PLMN-based (public land mobile network)	PLMN Type	Select a value from the menu – Select Mode, PLMN Only, PLMN+Single LAC, PLMN+Multi LAC. The setting for this field determines the types of the remaining fields in the record. ■ Select Mode – PLMN and LAC are not included ■ PLMN Only – PLMN is included but LAC is not ■ PLMN+Single LAC – PLMN and LAC are included ■ PLMN+Multi LAC – PLMN and multiple LACs are included	D
	PLMN	(This field is only defined if the PLMN Type field is Select Mode.) Select a value from the menu – Any PLMNs, Allowed PLMNs, Home PLMN ■ Any PLMNs – limited-service network selection mode ■ Allowed PLMNs – automatic network selection mode	D
	MCC (mobile country code)	(This field is only defined if the PLMN Type field is not Select Mode.) Enter a value for the MCC portion of the PLMN. The format is three decimal digits.	D
	MNC (mobile network code)	(This field is only defined if the PLMN Type field is not Select Mode.) Enter a value for the MNC portion of the PLMN. The format is two or three decimal digits. If only two digits are specified, the third digit will be stored as 0xF.	D
	Network Sel Mode	(This field is only defined if the PLMN Type field is not Select Mode.) Select a value from the menu – Manual, Automatic.	D
	LAC (Location Area Code)	(This field is only defined if the PLMN Type field is PLMN+Single LAC.) Enter a value for the LAC of the system associated with this record.	D
	LAC Count	(This field is only defined if the PLMN Type field is PLMN+Multi LAC.) Enter a value within the range 1 to 15 for the number of LACs included in this record.	D
	LAC 1-15	(These fields are only defined if the PLMN Type field is PLMN+Multi LAC, and the number is dependent on the value of the LAC Count field.) Enter a value for the corresponding LAC of the system associated with this record.	D
Undefined	Data Length	Enter a value for the number of bytes of undefined data in the record. These bytes will all be set to 0.	D

9.3 Text view mode

Text View mode presents a roaming list file formatted entirely as text, as shown in Figure 9-2. You can see a file in Text View mode by clicking the Text View icon on the toolbar. You can save from Text View mode into an ASCII text file (as opposed to the standard binary roaming list file). You can subsequently reopen the ASCII file with the Roaming List Editor and work with it exactly as you would a standard binary file.

NOTE If you click the Text View icon before entering all required information in the Edit mode window, a warning is displayed notifying you of the first field where an entry is missing or incorrect. You must correct all errors before using Text View mode.

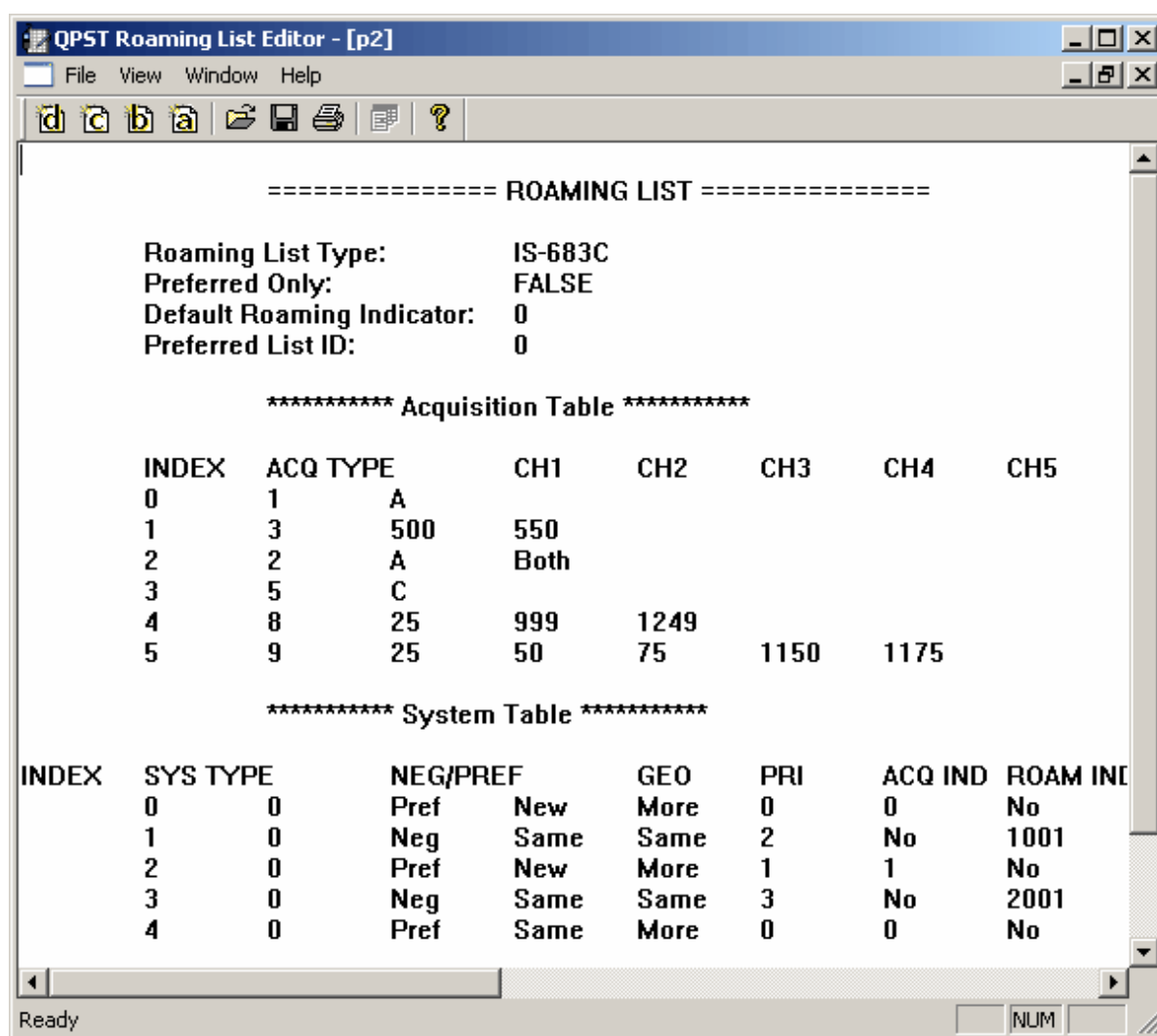


Figure 9-2 Roaming List Editor text view mode

9.4 Operating conventions

9.4.1 Use of mouse

Use your computer's mouse with Roaming List Editor's Edit mode as you would when using any Windows application:

- Left-click to select a toolbar icon, menu item, or field in the Roaming List Editor, or to switch the focus out of a field
- Right-click to open a pop-up menu for edit functions

9.4.2 Toolbar

The Roaming List Editor toolbar, shown in Figure 9-3, allows you to:

- Create a new roaming list in any of the supported formats
- Open a roaming list file, save a roaming list file
- Print a roaming list; printing is only available in Text View mode
- View a roaming list in Text View mode
- Display Roaming List Editor Help topics

You can show or hide the toolbar by selecting View→Toolbar.



Figure 9-3 Roaming List Editor toolbar

9.4.3 Special keys

Use TAB and ENTER to accept entered data and move through fields in each area of the Edit mode window. In a field containing a drop-down list, press ENTER to open the list, and then use the up and down arrow keys to highlight an entry in the list. Pressing ENTER again selects the highlighted item.

The left and right arrow keys move the focus through the cells of a row. The up and down keys move the focus within an open drop-down list.

Use ESC if you are typing a new entry in a table field and want to revert to the previous value.

Use DELETE to clear an entry from a table field.

9.5 Command line mode

Roaming List Editor can also be used in Command Line mode. This mode is useful when specific commands need to be applied to a roaming list file without any user interaction.

To use Command Line mode, invoke the Roaming List Editor from a command prompt with one of the supported command line options described in the following paragraphs.

Convert file from Binary to ASCII: -f

This option takes a binary file as input and generates an ASCII text file as output. For example, to generate an ASCII text file named “outfile.txt” from a binary file named “infile.prl”:

```
C:\>RLEditor.exe -f infile.prl outfile.txt
```

If the command fails to execute properly (perhaps due to a malformed input file), no output file will be generated.

Convert file from ASCII to Binary: -u

This option takes an ASCII text file as input and generates a binary file as output. For example, to generate a binary file named “outfile.prl” from an ASCII text file named “infile.txt”:

```
C:\>RLEditor.exe -u infile.txt outfile.prl
```

If the command fails to execute properly, no output file will be generated.

Note that the format of the input ASCII text file must strictly follow the format generated by the Roaming List Editor when it saves an ASCII text file; any deviation from this format will result in failure of the command. A suggested method to ensure adherence to the proper format is to start by converting a binary file into an ASCII text file, modifying that file as needed, then converting it back to binary.

10 FTM RF Evaluation GUI Application

This chapter provides information on how to use the Factory Test Mode (FTM) Radio Frequency (RF) Evaluation Graphical User Interface (GUI) software to test a phone.

FTM RF Evaluation GUI is an application used to control a QUALCOMM phone such as a Subscriber Unit Reference Design (SURF) or Form Factor Accurate (FFA) for testing RF in three system modes – CDMA 1X, GSM, and WCDMA.

This application requires Dual-Mode Subscriber Station (DMSS) or Advanced Mode Subscriber Software (AMSS) software with FTM built into it. The FTM mode must be enabled before using the CDMA 1X, GSM, and WCDMA RF controls.

FTM is a mode of operation that allows a user to perform diagnostic or design verification functionality by exposing functions not discretely available to the user in DMSS mode. FTM does not provide the ability to make phone calls and is not driven by the DMSS Call Processing State Machine.

10.1 Getting to know the application

For easier use of the application, become familiar with the miscellaneous configuration and menu commands.

10.1.1 Miscellaneous configuration

The miscellaneous configuration bar is located near the top of the application window, as shown in Figure 10-1. The bar allows you to change several configuration settings, such as FTM on and off, Mode Control, and Com Port.

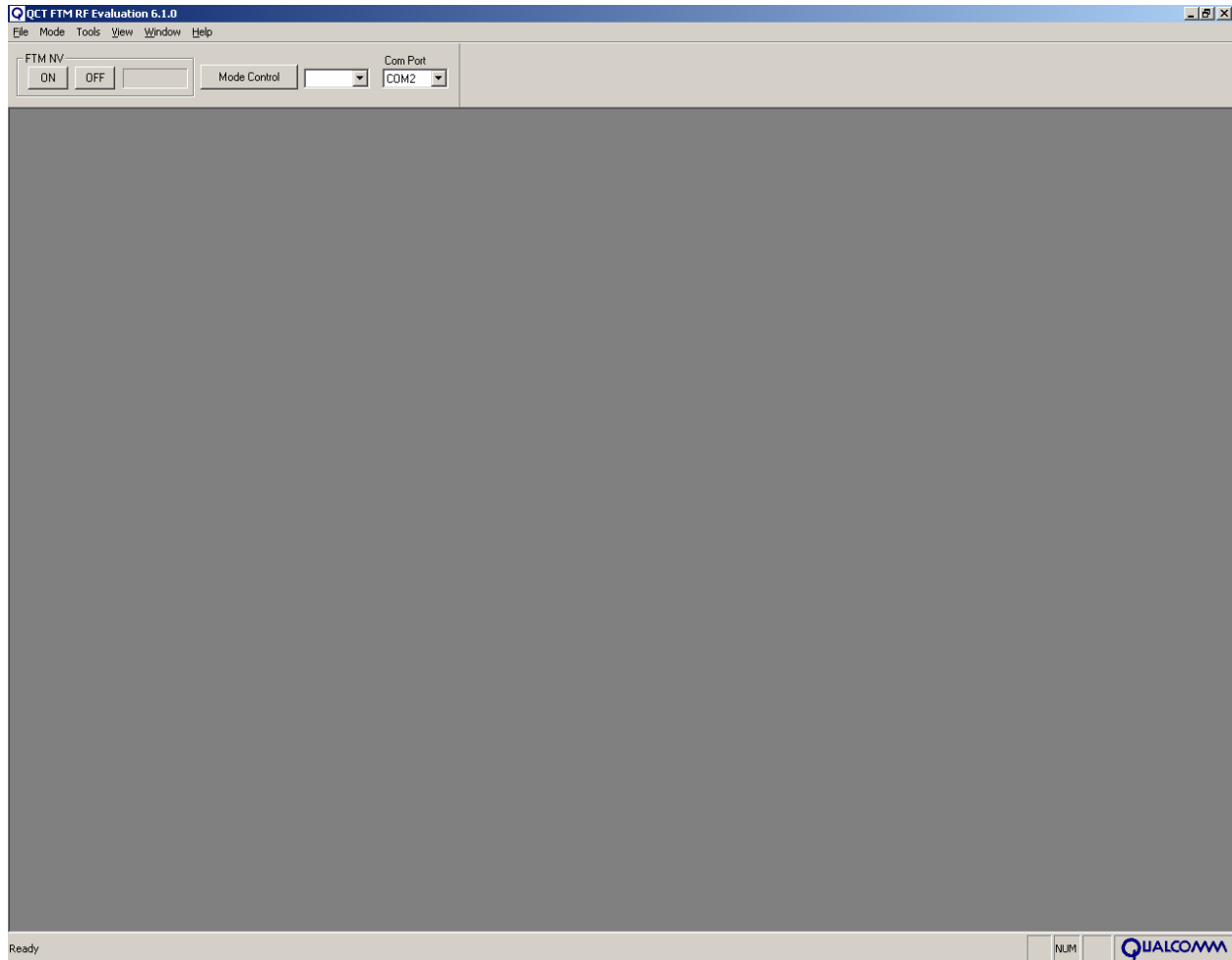


Figure 10-1 Miscellaneous configuration bar

10.1.1.1 FTM ON/OFF buttons and status box

The FTM area manually sets the boot-up mode of a factory test mode phone by writing to DMSS nonvolatile (NV) memory item, NV_FTM_MODE_I. The buttons function as follows:

- On sets the NV_FTM_MODE_I to 1 and writes it to NV memory in the phone.
- Off sets the NV_FTM_MODE_I to 0 and writes it to NV memory in the phone.

Refer to Section 10.2 for enabling FTM mode.

10.1.1.2 Mode control drop-down and button

The Mode Control drop-down list lets you select the DMSS operating mode. The operating modes are:

- Offline-d – offline digital mode
- Reset – resets DMSS, causing the phone to power cycle
- FTM – FTM mode
- Online – goes to online mode

Click MODE CONTROL to execute the selected DMSS operating mode.

10.1.1.3 COM port drop-down list

Use this list to select the COM port to which you have attached the phone, as shown in Figure 10-2.

10.1.2 Menu commands

The menu bar consists of menus for File, Edit, Mode, Tools, View, Window, and Help, as shown in Figure 10-2.

NOTE QCT FTM Evaluation does not monitor the state of the target.

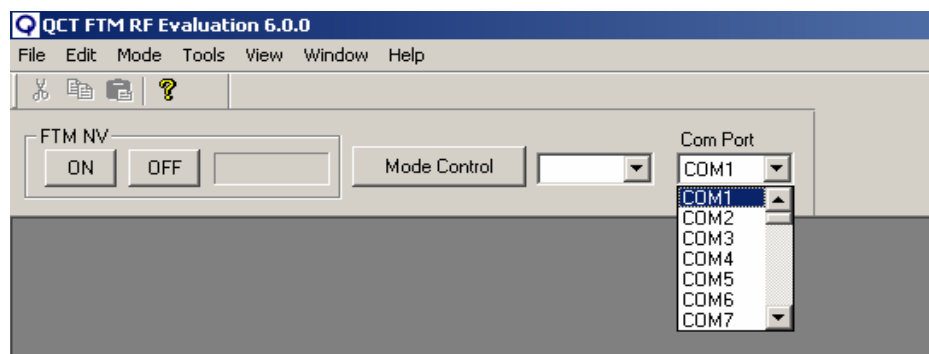


Figure 10-2 Menu commands

Menu commands are described in Table 10-1.

Table 10-1 Menu commands

Menu	Description
File	To close the application: Select File → Exit
Edit	The items in this menu have been disabled.
Mode	To switch between testing the CDMA 1x, CDMA 1x Dual Rx, GSM, or WCDMA services: Select Mode → CDMA 1x Note: Only one mode is active at one time.
Tools	This menu has two selections: ■ Tools → CDMA 2000 – displays supported cdma2000® controls ■ Tools → 1xEV-DO – displays supported 1xEV-DO controls
View	This menu has three selections: ■ View → Toolbar – displays or hides the Edit toolbar (below the menu bar) ■ View → Status Bar – displays or hides the Status Bar (at the bottom of the window) ■ View → Misc Config Bar – displays or hides the Misc Config Bar (below the menu bar)
Window	The features on the Window menu are either disabled or are not available with this version of the application.
Help	To display the About dialog: Select Help → About FtmGui

10.2 Enable FTM mode

10.2.1 Run-time switch to FTM

The preferred way of enabling FTM is at run-time, switching from DMSS to FTM with no reboot required. The DMSS software build must have this feature in order to switch at run-time.

To switch to FTM at run-time:

1. Open the drop-down list to the right of MODE CONTROL in the Miscellaneous Configuration bar, as shown in Figure 10-3.

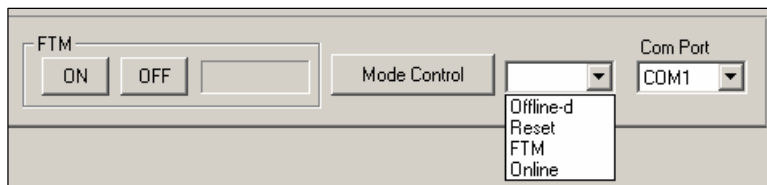


Figure 10-3 Mode control drop-down list

2. Select FTM.
3. Click MODE CONTROL.

Once in FTM mode, you can switch back to DMSS by selecting Online in the drop-down list and clicking MODE CONTROL.

10.2.2 Setting NV_FTM_MODE_I item

Setting the NV_FTM_MODE_I NV item is another way of enabling FTM mode, and it is a boot-time feature that requires a phone reset after setting the NV item. This procedure is suggested if run-time switching from DMSS to FTM is not enabled in the DMSS software.

To enable FTM by setting the NV item:

1. Open the drop-down list to the right of MODE CONTROL.
2. Select Offline-d mode.
3. Click MODE CONTROL.
4. Click ON in the FTM area of the Miscellaneous Configuration bar (see Section 10.1.1.1 for details).
5. Open the drop-down list to the right of MODE CONTROL.
6. Select Reset mode.
7. Click MODE CONTROL again.

To disable FTM mode, repeat the procedure above, but instead of clicking ON in step 4, click OFF.

10.2.3 Selecting system mode

To start using this application for RF evaluation, select a system mode from the Mode menu, as shown in Figure 10-4. A window with RF controls appropriate to the system mode you selected will appear.

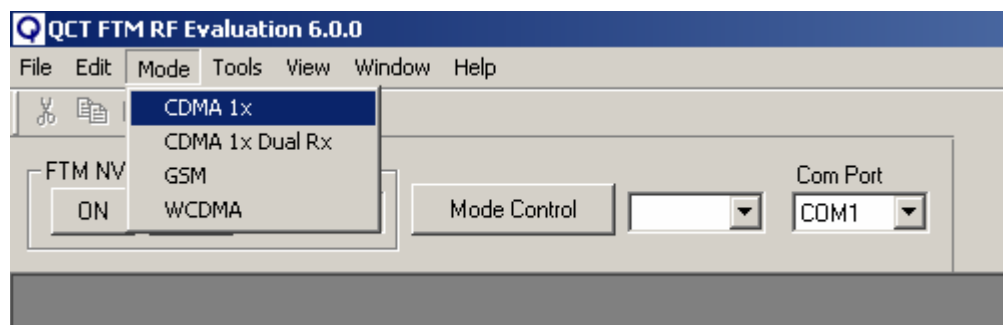


Figure 10-4 Mode menu

When you close the application, it remembers which system mode you have selected and will display the window for that mode the next time it runs.

10.3 CDMA 1X mode

The CDMA 1X mode window is shown in Figure 10-5. It consists of four control areas, Misc, Tx, Rx, and FM, which are described in detail in the following subsections.

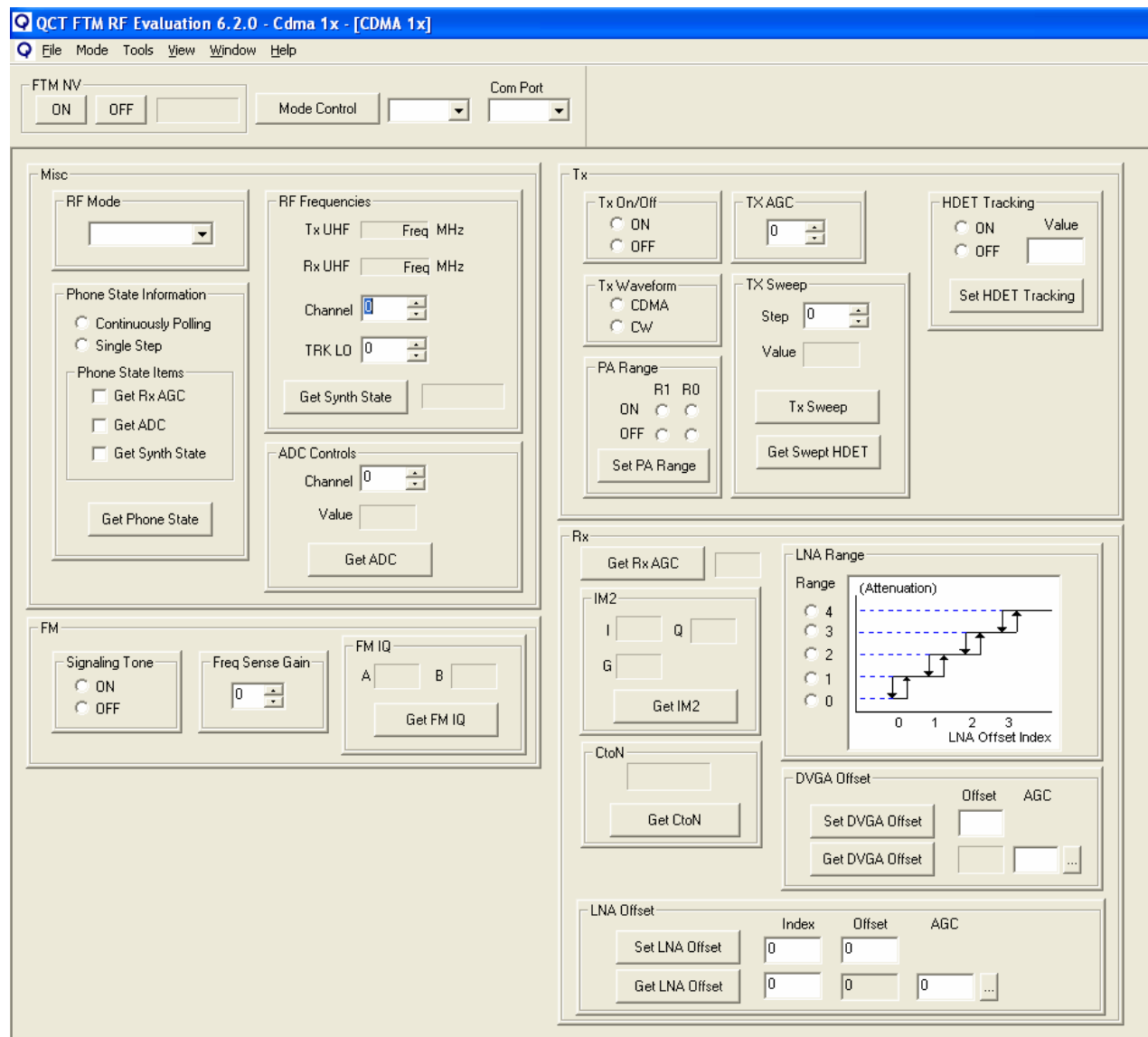


Figure 10-5 CDMA 1X mode window

10.3.1 Miscellaneous CDMA 1X controls

The miscellaneous CDMA 1X controls, as shown in Figure 10-6, consist of the following:

- RF Mode – see Section 10.3.1.1 for details
- RF Frequencies – see Section 10.3.1.2 for details
- Phone State Information – see Section 10.3.1.3 for details
- ADC Controls – see Section 10.3.1.4 for details

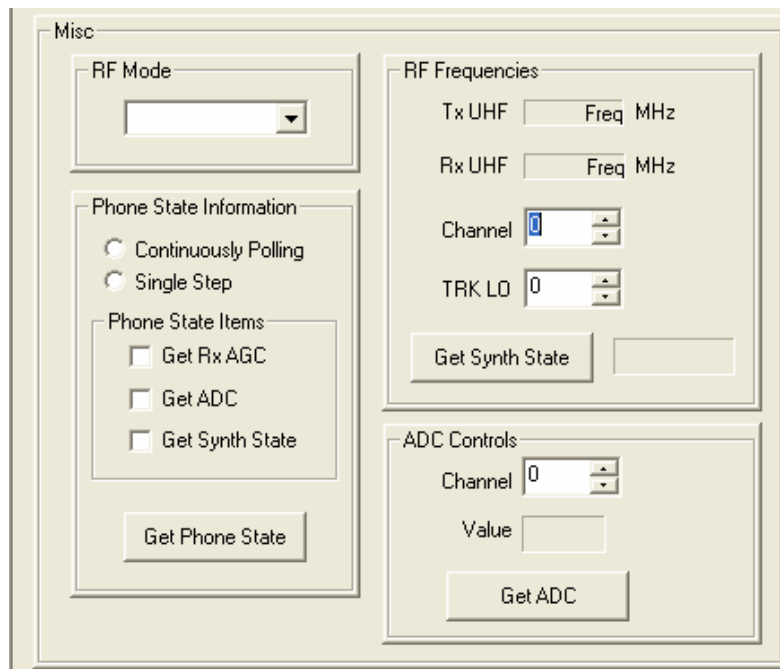


Figure 10-6 Miscellaneous CDMA 1X controls

10.3.1.1 RF mode

The RF mode drop-down list, shown in Figure 10-7, lets you select from several RF modes; CDMA 800, CDMA 1900, FM, GPS-SINAD, CDMA 1800, JCDMA, GPS, CDMA 450, HDR 800, HDR 1900, CDMA IMT, and BC11.

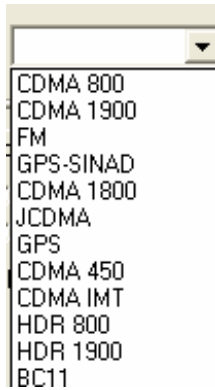


Figure 10-7 RF mode drop-down list

10.3.1.2 RF frequencies

The RF Frequencies area contains the following:

- The current values for the Tx UHF and Rx UHF, for the channel indicated in the Channel field, are displayed. The Channel field shows the channel that is currently being tested. You can change the channel by clicking the up/down arrows or by double-clicking in the Channel field and typing a number. A valid channel number, per the applicable standard, is available.
- The TRK LO is used to set the tracking local oscillator (TRK LO), as shown in Figure 10-6. You set this value by clicking the up/down arrows or by double-clicking in the field and typing a number. TRK LO controls the voltage controlled temperature compensated crystal oscillator (VCTXO) frequency.
- GET SYNTH STATE retrieves and displays the synthesizer status; indicates whether all active phase-lock loops (PLLs) are locked or unlocked

10.3.1.3 Phone state information

This area offers two methods for collecting the selected phone state items:

- Click the Continuously Polling radio button to update the selected phone state items continuously. The data for the selected phone state items will be retrieved continuously.
- Click the Single Step radio button for a single data retrieval of the phone state items. Then click GET PHONE STATE and the software will retrieve and display the selected items.

NOTE The Get IM2 button (in CDMA 1x Rx Controls, discussed in Section 10.3.3.4) is disabled if continuous polling is used.

- Select or deselect the following phone state items by clicking the item to place or remove a check mark:
 - Get Rx AGC – see Section 10.3.3.1 for details
 - Get ADC – see Section 10.3.1.4 for details
 - Get Synth State – see Section 10.3.1.2 for details

10.3.1.4 ADC controls

You can change the analog-to-digital converter (ADC) channel by clicking the up/down arrows or by double-clicking in the Channel box and typing a channel number from 0 to 9.

Click GET ADC to retrieve the ADC housekeeping data for the selected ADC channel and display it in the Value box.

10.3.2 CDMA 1x Tx controls

The CDMA 1x Tx controls, as shown in Figure 10-8, consist of:

- Tx On/Off – see Section 10.3.2.1 for details
- Tx AGC – see Section 10.3.2.2 for details
- Tx Waveform – see Section 10.3.2.3 for details
- Tx Sweep – see Section 10.3.2.4 for details
- PA Range – see Section 10.3.2.5 for details
- HDET Tracking – see Section 10.3.2.6 for details

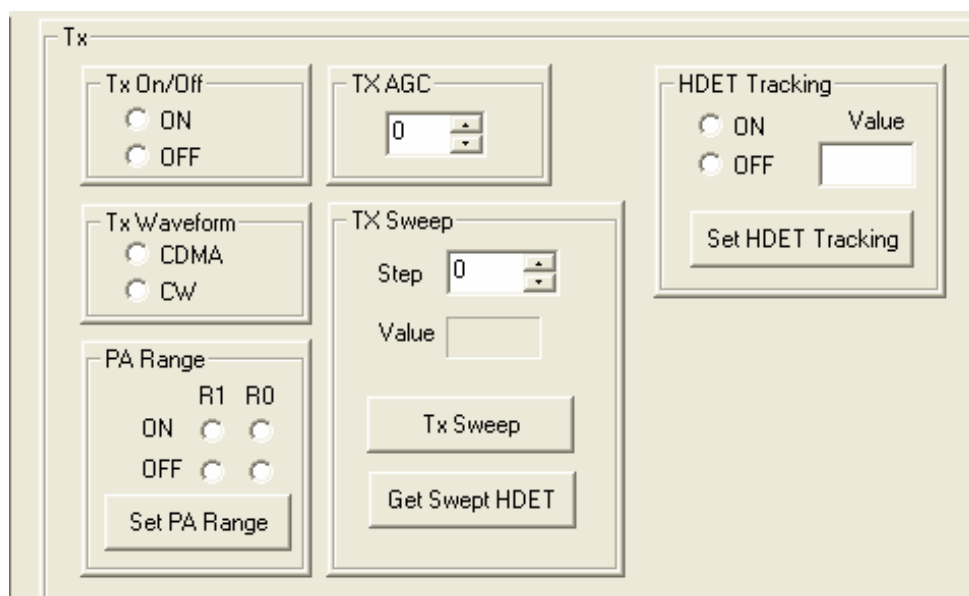


Figure 10-8 CDMA 1x Tx controls

10.3.2.1 Tx on/off

Click the appropriate radio button to turn the transmit chain, including the power amplifier, On or Off.

10.3.2.2 Tx AGC

You can change the Tx AGC value by clicking the up/down arrows or by double-clicking in the TX AGC box and typing a number from 0 to 511. In CDMA RF modes, 0 represents maximum transmit gain and 511 represents minimum transmit gain. In FM mode, the maximum and minimum transmit gains are reversed.

10.3.2.3 Tx waveform

Click the appropriate radio button to select CDMA or continuous waveform (CW). The CDMA option delivers a CDMA waveform from the hardware platform under test and CW delivers a continuous sinusoidal waveform, both centered at the selected Tx channel frequency.

10.3.2.4 Tx sweep

You can change the channel by clicking the up/down arrows or by double-clicking in the Step box and typing a number.

Click GET SWEPT HDET to retrieve high power detector (HDET) power data at the selected HDET step, and the data is displayed in the Value box.

10.3.2.5 PA range

Select power amplifier (PA) range by clicking the appropriate radio button. OFF sets the PA to high-power mode, and ON sets it to low-power mode. R1 controls the PA Range 1 settings, and R0 controls the PA Range 0 settings. Set PA by clicking SET PA RANGE, based on the R1 and R0 selections.

10.3.2.6 HDET tracking

Click the ON radio button to enable the HDET tracking loop at the desired HDET value. The OFF button disables the HDET tracking loop. When enabling the HDET tracking loop, enter an HDET number in the Value field. Click SET HDET TRACKING to execute the command.

10.3.3 CDMA 1X Rx controls

The CDMA 1x Rx controls, as shown in Figure 10-9, consist of:

- Get Rx AGC – see Section 10.3.3.1 for details
- DVGA Offset – see Section 10.3.3.2 for details
- LNA Range – see Section 10.3.3.3 for details
- IM2 – see Section 10.3.3.4 for details
- LNA Offset – see Section 10.3.3.5 for details
- CtoN – see Section 10.3.3.6 for details

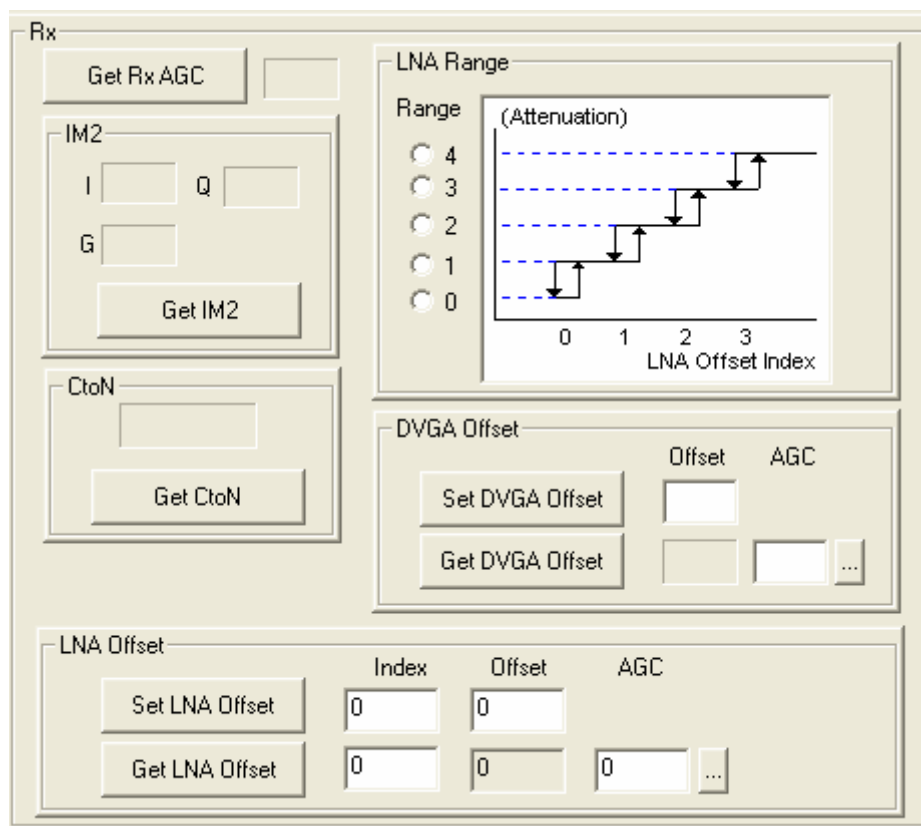


Figure 10-9 CDMA 1X Rx controls

10.3.3.1 Get Rx AGC

Click GET RX AGC to retrieve CDMA receiver AGC value, and the data is displayed in the box to the right of the button.

10.3.3.2 DVGA offset

To set DVGA offset, type a number in the Set DVGA (digital variable gain amplifier) Offset box and click SET DVGA OFFSET to set a value.

To get DVGA offset, provide the corresponding AGC value, and click GET DVGA OFFSET to retrieve the DVGA offset.

Click the  button to obtain a power to AGC converter.

NOTE The AGC parameter might not be supported depending on the embedded software. If the embedded software does not support the AGC parameter, the AGC value is discarded. For details, refer to [R1].

10.3.3.3 LNA range

The LNA (low noise amplifier) Range section sets the LNA gain state for the RF modes:

- CDMA – five gain settings; 0, 1, 2, 3, and 4; 0 = highest, 4 = lowest
- FM – two gain settings 0 and 1; 0 = high gain, 1 = low gain
- GPS – fixed gain (LNA range is not applicable)

Click the appropriate radio button to select the gain state at the particular RF mode.

10.3.3.4 IM2

Click GET IM2 to retrieve the IM2 (intermodulation 2) calibration register values and display the results in the I, Q, and G (transconductance) boxes.

10.3.3.5 LNA offset

To set LNA offset, type numbers into the Index and Value boxes and click SET LNA OFFSET to set the LNA offset register for the given index value.

To get LNA offset, click GET LNA OFFSET to retrieve the LNA offset value for the given index.

10.3.3.6 CtoN

Click GET CTON to display the carrier-to-noise ratio as calculated at the Rx front end of the receive chain.

10.3.4 CDMA 1X FM controls

The CDMA 1x FM controls, as shown in Figure 10-10, consist of:

- Signaling Tone – see Section 10.3.4.1 for details
- Freq Sense Gain – see Section 10.3.4.2 for details
- FM IQ – see Section 10.3.4.3 for details

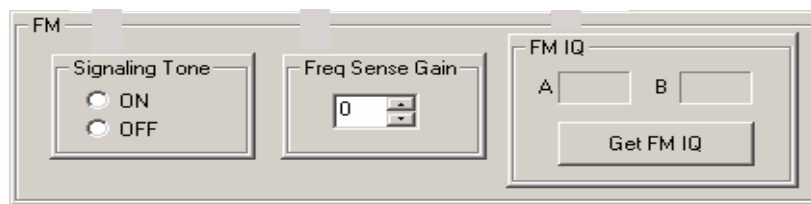


Figure 10-10 CDMA 1X FM controls

10.3.4.1 Signaling tone

Click the appropriate radio button to turn signaling tone on or off. When Signaling Tone is set to On, it generates a 10-kHz FM signal for the mobile to transmit.

10.3.4.2 Freq sense gain

Set the frequency sense gain register to set the digital frequency modulation (DFM) index value by clicking the up/down arrows or by double-clicking in the box and typing a number. The range of data is from 0 to 63, with 0 the minimum value and 63 the maximum value.

10.3.4.3 FM IQ

The frequency modulation inphase and quadrature (FM IQ) displays A and B compensation values. Click Get FM IQ to retrieve A and B compensation values for the FM RF mode and display them in the A and B boxes.

10.4 CDMA 1X dual-Rx mode

The CDMA 1x dual-Rx mode window is shown in Figure 10-11. It has two main areas, Primary Chain Controls and Secondary Chain Controls.

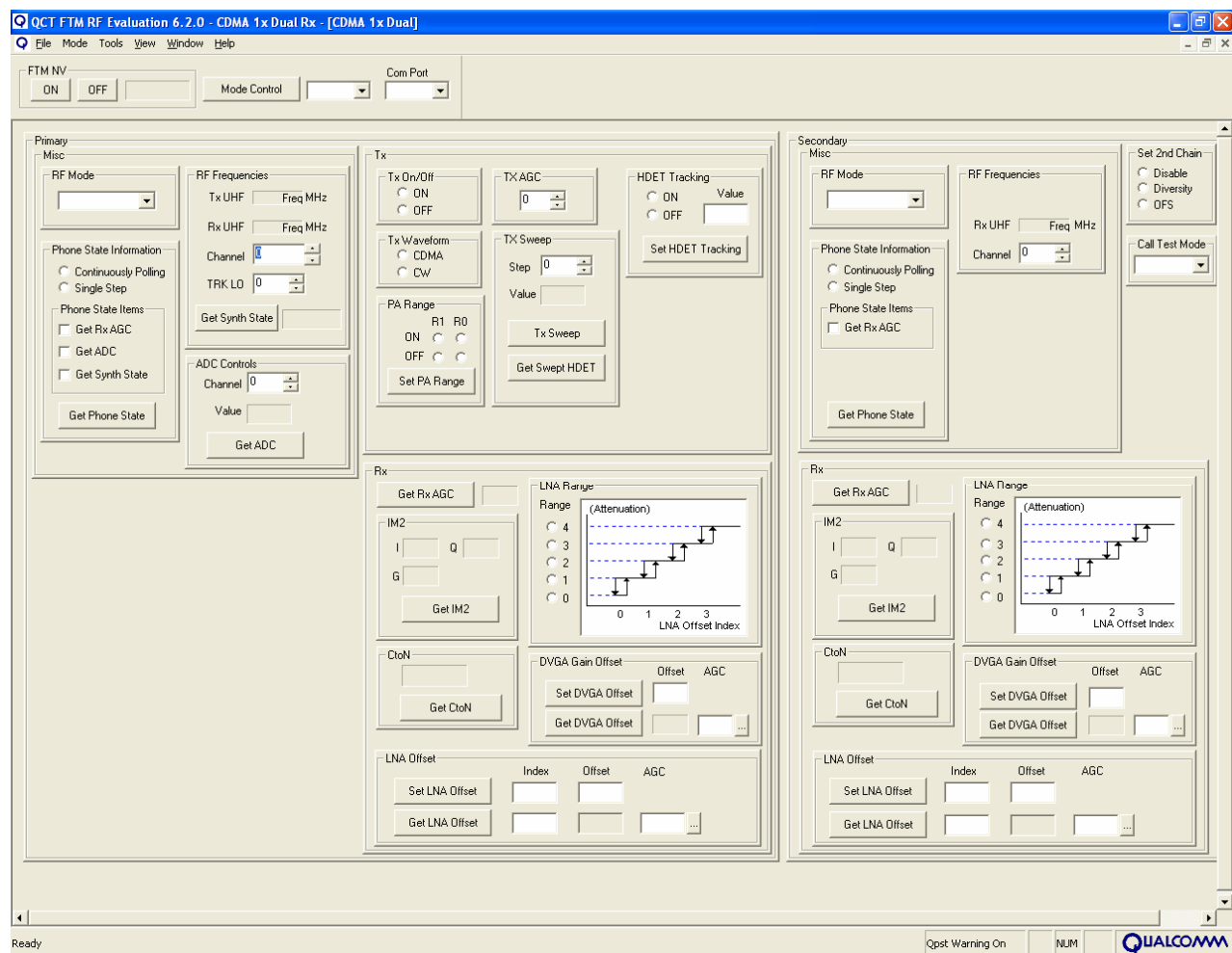


Figure 10-11 CDMA 1X dual-Rx mode window

10.4.1 Primary chain controls

The CDMA 1X dual-Rx primary chain controls, as shown in Figure 10-12, consist of three control areas, Misc, Tx, and Rx. These are described in detail in the following subsections.

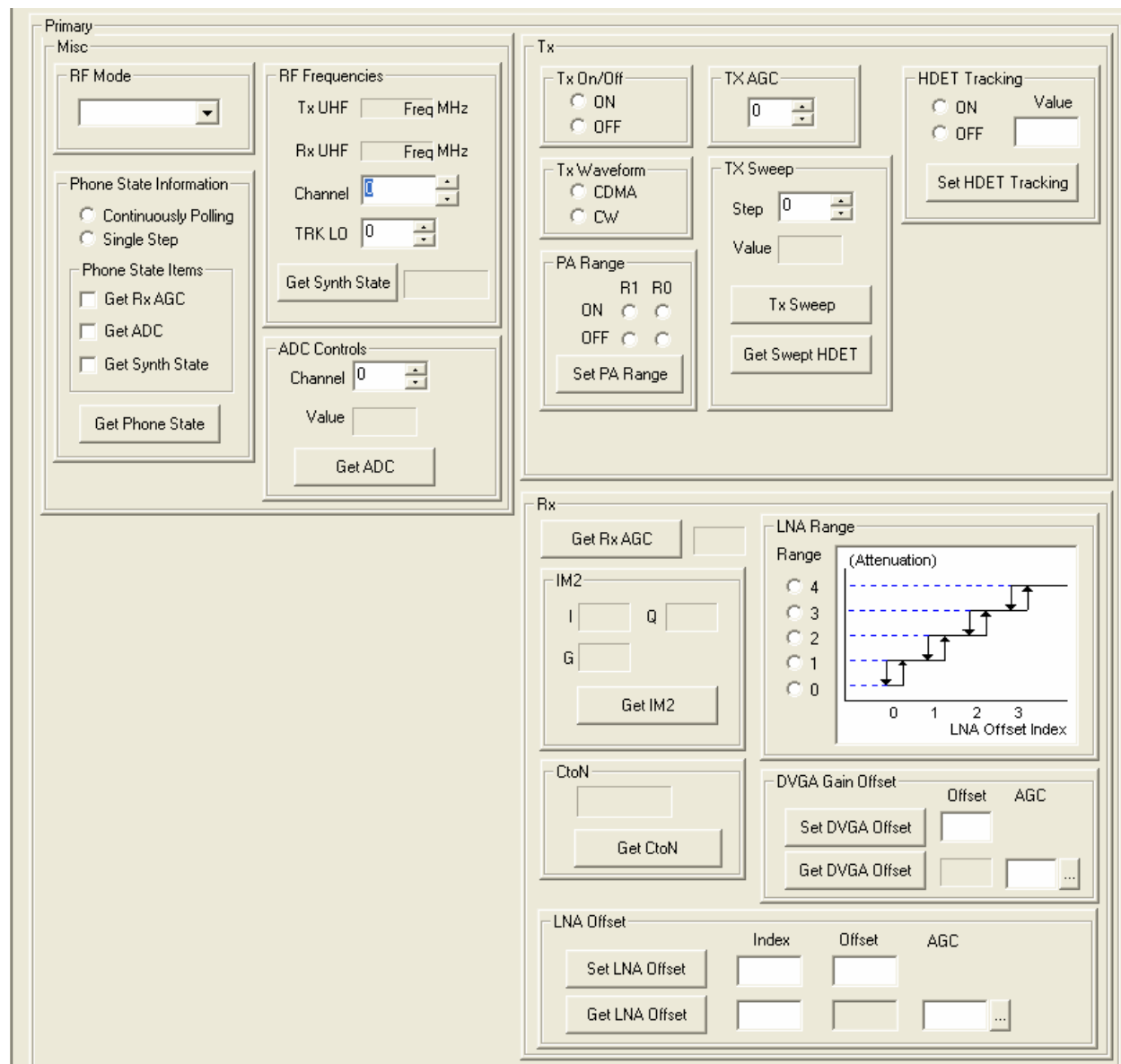


Figure 10-12 CDMA 1X dual-Rx primary chain controls

10.4.1.1 Miscellaneous CDMA 1X dual-Rx primary chain controls

The miscellaneous controls in the CDMA 1X dual-Rx primary chain control area are the same as those in the miscellaneous CDMA 1X controls. See Section 10.3.1 for details.

10.4.1.2 CDMA 1X dual-Rx primary chain Tx controls

The Tx controls in the CDMA 1X dual-Rx primary chain control area are the same as those in the CDMA 1X Tx controls. See Section 10.3.2 for details.

10.4.1.3 CDMA 1X dual-Rx primary chain Rx controls

The Rx controls in the CDMA 1X dual-Rx primary chain control area are the same as those in the CDMA 1X Rx controls. See Section 10.3.3 for details.

10.4.2 Secondary chain controls

The CDMA 1X dual-Rx secondary chain controls, as shown in Figure 10-13, consist of four control areas, Misc, Rx, Set 2nd Chain, and Call Test Mode. These are described in detail in the following subsections.

The screenshot shows the 'Secondary' control panel with the following sections:

- Misc:**
 - RF Mode:** A dropdown menu.
 - RF Frequencies:**
 - Rx UHF: A text field.
 - Freq MHz: A text field.
 - Channel: A dropdown menu with '0' selected.
 - Phone State Information:**
 - ☐ Continuously Polling
 - ☐ Single Step
 - Phone State Items:**
 - ☐ Get Rx AGC
 - Get Phone State:** A button.
- Rx:**
 - Get Rx AGC:** A button.
 - IM2:**
 - I: A text field.
 - Q: A text field.
 - G: A text field.
 - Get IM2:** A button.
 - CtoN:**
 - A text field.
 - Get CtoN:** A button.
 - LNA Range:**
 - Range: Radio buttons for 4, 3, 2, 1, 0.
 - (Attenuation) graph showing a step function with LNA Offset Index (0, 1, 2, 3) on the x-axis.
 - DVGA Gain Offset:**
 - Offset: A text field.
 - AGC: A text field.
 - Set DVGA Offset:** A button.
 - Get DVGA Offset:** A button.
 - LNA Offset:**
 - Index: A text field.
 - Offset: A text field.
 - AGC: A text field.
 - Set LNA Offset:** A button.
 - Get LNA Offset:** A button.
- Set 2nd Chain:**
 - ☐ Disable
 - ☐ Diversity
 - ☐ OFS
- Call Test Mode:** A dropdown menu.

Figure 10-13 CDMA 1X dual-Rx secondary chain controls

10.4.2.1 Miscellaneous CDMA 1X dual-Rx secondary chain controls

The miscellaneous controls in the CDMA 1X dual-Rx secondary chain control area are the same as those in the miscellaneous CDMA 1X controls, with the following exception:

- Phone State Information area does not have a Get ADC selection

See Section 10.3.1 for all other control details.

10.4.2.2 CDMA 1X dual-Rx secondary chain Rx controls

The Rx controls in the CDMA 1X dual-Rx secondary chain control area are the same as those in the CDMA 1X Rx controls. See Section 10.3.3 for details.

10.4.2.3 CDMA 1X dual-Rx secondary chain Set 2nd Chain controls

The Set 2nd Chain controls, shown in Figure 10-14, consist of:

- Disable – disables the secondary chain; the buttons will be grayed out accordingly
- Diversity – enables the diversity mode to the secondary chain
- OFS – enables the OFS mode to the secondary chain



Figure 10-14 CDMA 1X dual-Rx Set 2nd Chain controls

10.4.2.4 CDMA 1x dual-Rx secondary chain call test mode controls

The Call Test Mode controls configure DMSS for secondary chain test call mode. Use the drop-down list to enable or disable the controls.

10.5 GSM mode

The GSM mode window is shown in Figure 10-15. It consists of five control areas, Misc, Power Control, TX Burst Command, RX Burst Command, and PDM, which are described in detail in the following subsections.

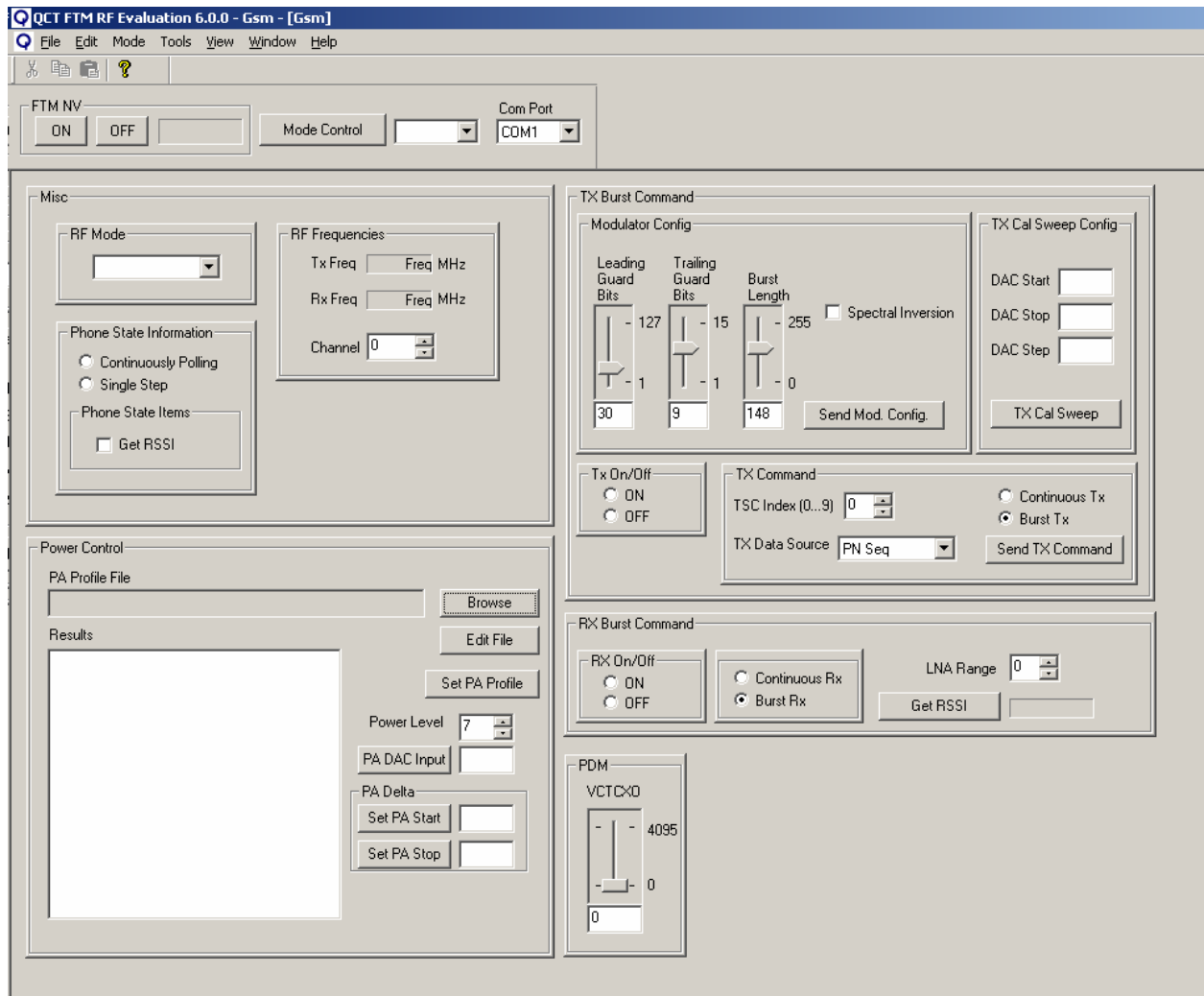


Figure 10-15 GSM mode window

10.5.1 Miscellaneous GSM controls

The miscellaneous GSM controls, as shown in Figure 10-16, consist of:

- RF Mode – see Section 10.5.1.1 for details
- RF Frequencies – see Section 10.5.1.2 for details
- Phone State Information – see Section 10.5.1.3 for details

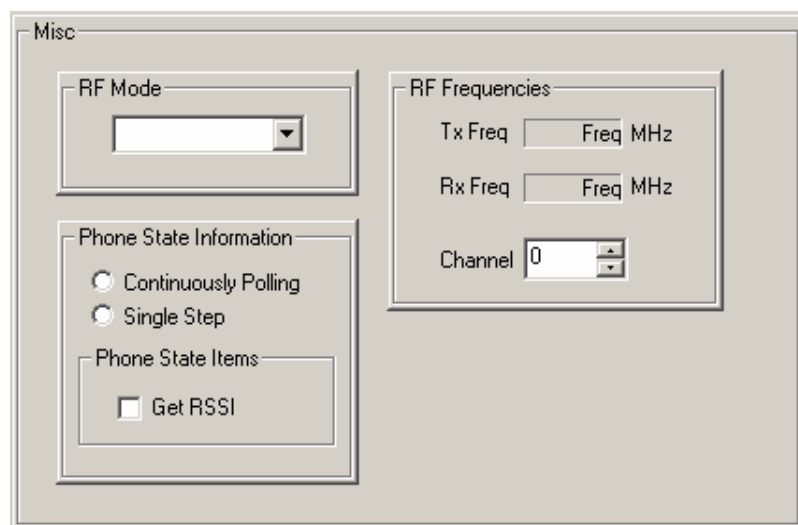


Figure 10-16 Miscellaneous GSM controls

10.5.1.1 RF mode

The RF mode drop-down list, shown in Figure 10-17, lets you select from several RF modes; GSM 900, GSM 1900, GSM 850, and GSM 1800.

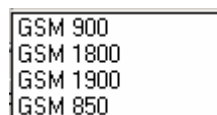


Figure 10-17 RF mode drop-down list

10.5.1.2 RF frequencies

This area displays the current values for the Tx UHF and Rx UHF for the channel indicated in the Channel box. The Channel box shows the channel that is currently being tested.

You can change the channel by clicking the up/down arrows or by double-clicking in the Channel box and typing a number. A valid channel number per the applicable standard is available.

10.5.1.3 Phone state information

This area offers two methods for collecting the selected phone state items:

- Click the Continuously Polling radio button to update the selected phone state items continuously. The data for the selected phone state items will be retrieved continuously.
- Click the Single Step radio button for a single data retrieval of the phone state items. Then click Get Phone State and the software will retrieve and display the selected Phone State Item. Select or deselect the Get RSSI phone state item by clicking the item to place or remove a check mark. See Section 10.5.4 for details on Get RSSI.

10.5.2 GSM power controls

GSM power controls allow you to control the PA. The GSM power controls, as shown in Figure 10-18, consist of:

- Browse – see Section 10.5.2.1 for details
- Edit File – see Section 10.5.2.2 for details
- Set PA Profile – see Section 10.5.2.3 for details
- Power Level – see Section 10.5.2.4 for details
- PA DAC Input – see Section 10.5.2.6 for details
- PA Delta – see Section 10.5.2.6 for details

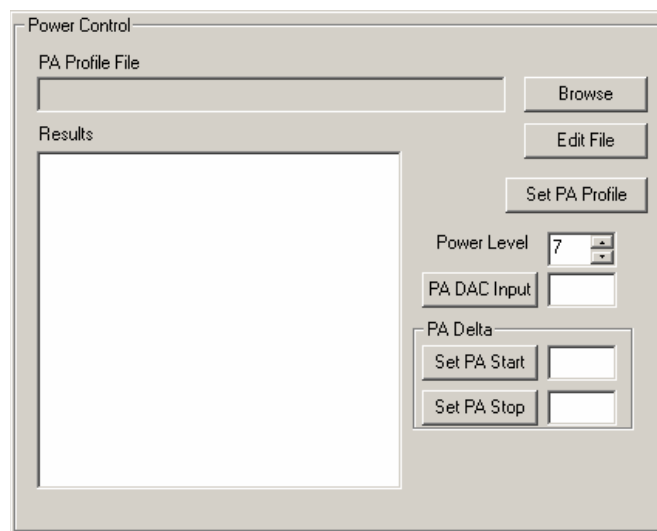


Figure 10-18 GSM power controls

10.5.2.1 Browse

Click BROWSE to use standard Windows navigation procedures to locate and select a PA profile file. The PA Profile File box displays the filename.

10.5.2.2 Edit File

Click EDIT FILE to edit the PA profile file you have selected. The application will launch the file in Notepad.

10.5.2.3 Set PA profile

Click SET PA PROFILE to load the selected PA profile file. The PA profile file contains:

- PA ramp-up data
- PA ramp-down data
- PA look-up table (LUT) size
- PA step size

The Sample_PA_Profile.txt file is provided with the FTM RF Evaluation GUI application. Refer to that file for sample contents and format.

10.5.2.4 Power level

You can change the PA power level by clicking the up/down arrows or by double-clicking in the box and typing a number.

10.5.2.5 PA DAC Input

Click in the box, type a PA (DAC input value, and click PA DAC INPUT to set the digital sequence input code to the PA DAC, which scales the last PA ramp set.

10.5.2.6 PA delta

To set PA start, click in the Set PA Start box, type the PA start time value, and click SET PA START to offset the PA ramp start time.

To set PA stop, click in the Set PA Stop box, type the PA stop time value, and click SET PA STOP to offset the PA ramp stop time.

10.5.3 GSM Tx burst command controls

The GSM Tx burst command controls, as shown in Figure 10-19, consist of:

- Modulator Config – see Section 10.5.3.1 for details
- Tx On/Off – see Section 10.5.3.2 for details
- Tx Cal Sweep Config – see Section 10.5.3.4 for details
- Tx Command – see Section 10.5.3.3 for details

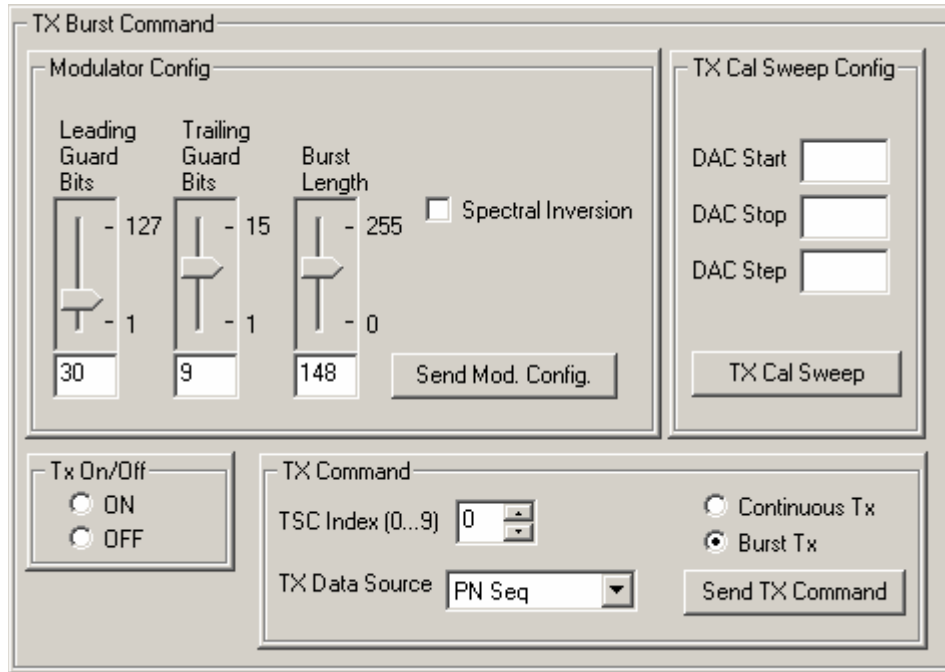


Figure 10-19 GSM Tx burst command controls

10.5.3.1 Modulator Config

To configure the modulator, adjust the settings in the Modulator Config area and click SEND MOD CONFIG. The settings are:

- Leading Guard Bits – drag the slider to select the leading guard bit value, or double-click in the box and type a number; valid range is 1 to 127
- Trailing Guard Bits – drag the slider to select the trailing guard bit value, or double-click in the box and type a number; valid range of the trailing guard bits is 1 to 15
- Burst Length – drag the slider to select the burst length value, or double-click in the box and type a number; valid range is 0 to 255
- Spectral Inversion – click to place a check in the square to enable (or click to remove the check to disable) spectral inversion

10.5.3.2 On/off

Click the radio button to turn the transmit chain on or off.

10.5.3.3 Tx cal sweep config

Configure the DAC start, stop, and step, and then click TX CAL SWEEP to send the command.

10.5.3.4 Tx command

There are two ways of setting the Tx command, Continuous Tx and Burst Tx. Click the radio button to select which Tx command, adjust the settings in the Tx command area, then click SEND TX COMMAND to execute this command and configure the settings. The settings are:

- TX Data Source – use this drop-down list to select PN sequence or tone
- TSC Index – set a value from 0 to 9 by clicking the up/down arrows or by double-clicking in the TSC (training sequence) Index box and typing a number

NOTE The Continuous Tx command does not use the TSC index.

10.5.4 GSM Rx burst command controls

GSM Rx burst command controls, shown in Figure 10-20, consist of:

- Rx On/Off – Select On or Off to start or stop receiver processing
- Continuous/Burst – continuous and burst Rx determines how the receiver processes; to configure the receiver processing, turn off the Rx before setting the continuous or burst configuration
- Get RSSI – click Get RSSI to display the return signal strength indicator value
- LNA Range – set the LNA gain state by clicking the up/down arrows in the LNA Range box or by double-clicking in the box and typing a number

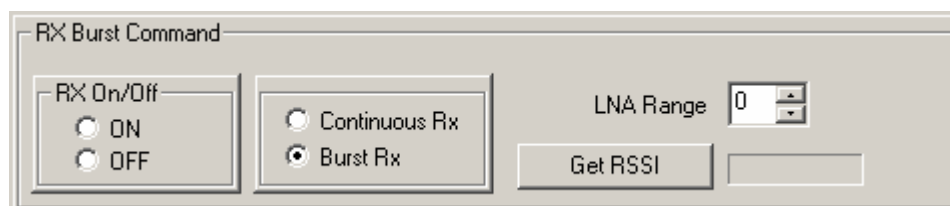


Figure 10-20 GSM Rx burst command controls

10.5.5 GSM PDM control

The GSM PDM control is shown in Figure 10-21. To set the VCTCXO frequency value, drag the slider or double-click in the box and type a number. The maximum VCTCXO frequency is 4095, and the minimum value is 0.



Figure 10-21 GSM PDM control

10.6 WCDMA mode

The WCDMA mode window is shown in Figure 10-22. It consists of three control areas, Misc, Tx, and Rx, which are described in detail in the following subsections.

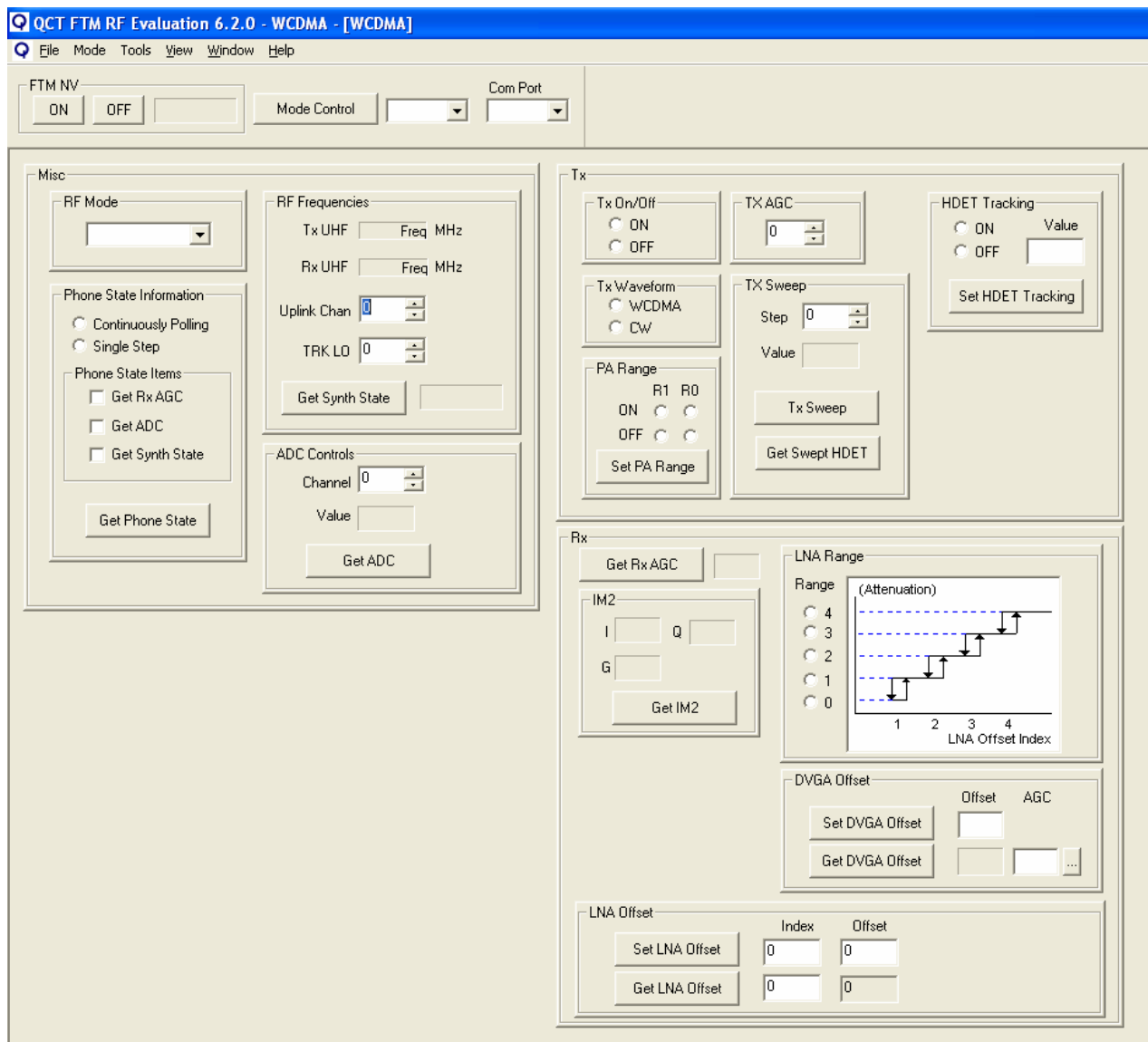


Figure 10-22 WCDMA mode window

10.6.1 Miscellaneous WCDMA controls

The miscellaneous WCDMA controls are the same as those in the miscellaneous CDMA 1x controls, with the following exceptions:

- RF Mode drop-down list is specific to WCDMA; RF mode selections are WCDMA IMT, WCDMA 1900A, WCDMA 1900B, and WCDMA 800
- RF Frequencies area displays Tx UHF, Rx UHF, Uplink Chan values, TRK LO, and Get Synth State

See Section 10.3.1 for all other control details.

10.6.2 WCDMA Tx controls

The WCDMA Tx controls are the same as those in the CDMA 1x Tx controls, except that the values displayed are for WCDMA. See Section 10.3.2 for details.

10.6.3 WCDMA Rx controls

The WCDMA Rx controls are the same as those in the CDMA 1x Rx controls, with the following exceptions:

- Values displayed are for WCDMA
- LNA range is for WCDMA – five gain settings 0, 1, 2, 3, and 4; 0 = highest, 4 = lowest
- No CtoN area

See Section 10.3.3 for all other control details.

10.7 cdma2000

The cdma2000 tool is only supported in CDMA 1x mode. Select Tools → CDMA2000, as shown in Figure 10-23.

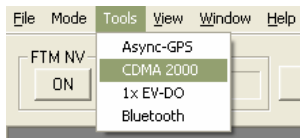


Figure 10-23 Selecting cdma2000

The cdma2000 is only supported in CDMA 1x mode. The cdma2000 window, as shown in Figure 10-24, consists of two areas, Configuration and FTM Log, which are described in detail in the following subsections.

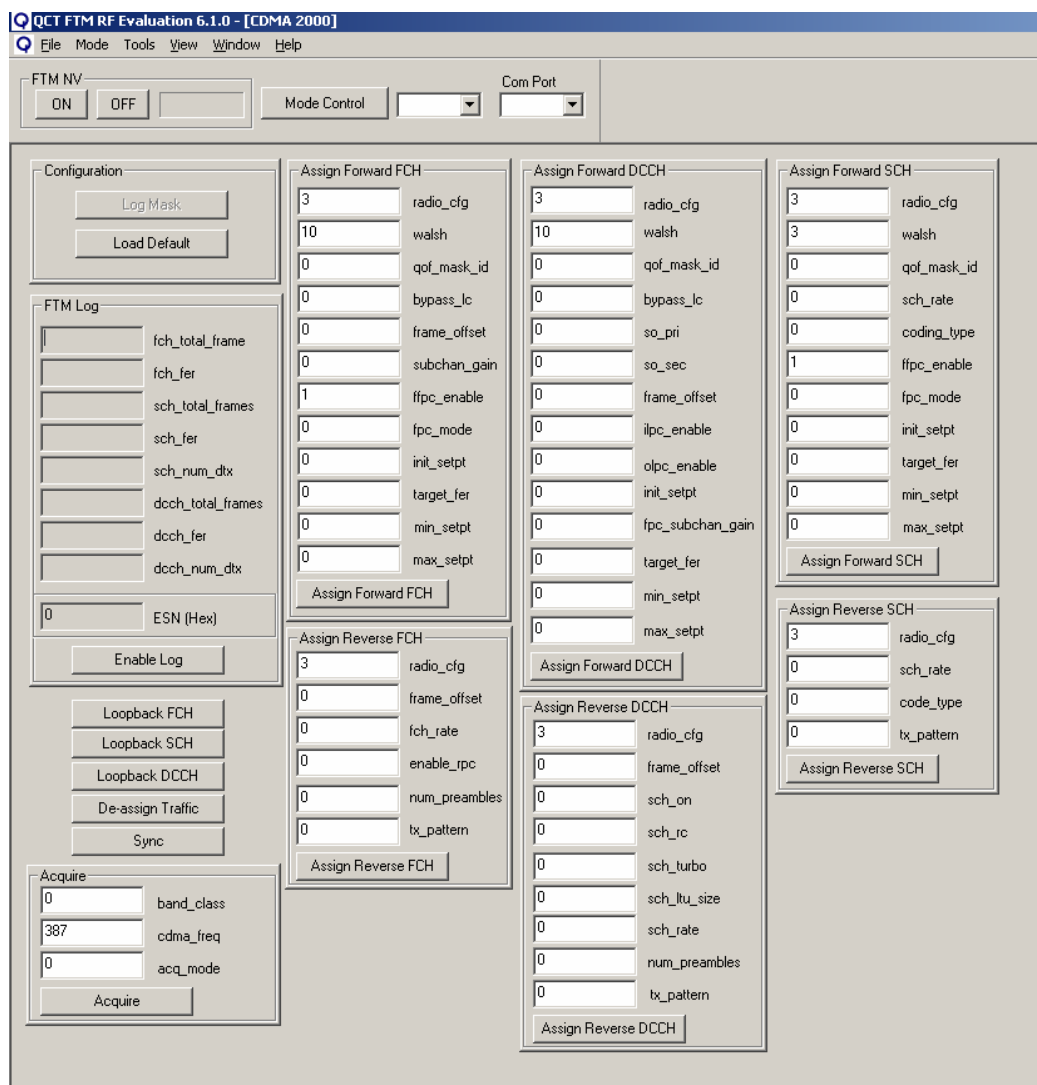


Figure 10-24 cdma2000 window

10.7.1 Configuration

Configuration consists of Log Mask and Load Default. Click LOG MASK to display a dialog box, as shown in Figure 10-25, that enables and displays available log packets. Click LOAD DEFAULT to provide default values to the edit boxes.

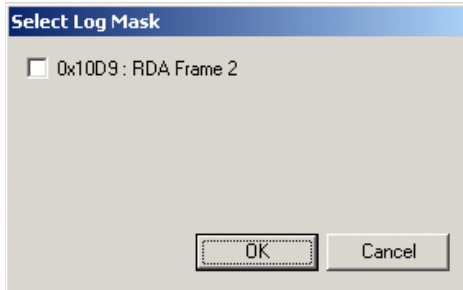


Figure 10-25 Select Log Mask dialog

10.7.2 FTM log

FTM log displays the FTM log status, as shown in Figure 10-26. If there is no log data coming back from the target, the Log Mask Status dialog box will remain blank. Click Enable Log to re-enable the log mask for the cdma2000 log packets.

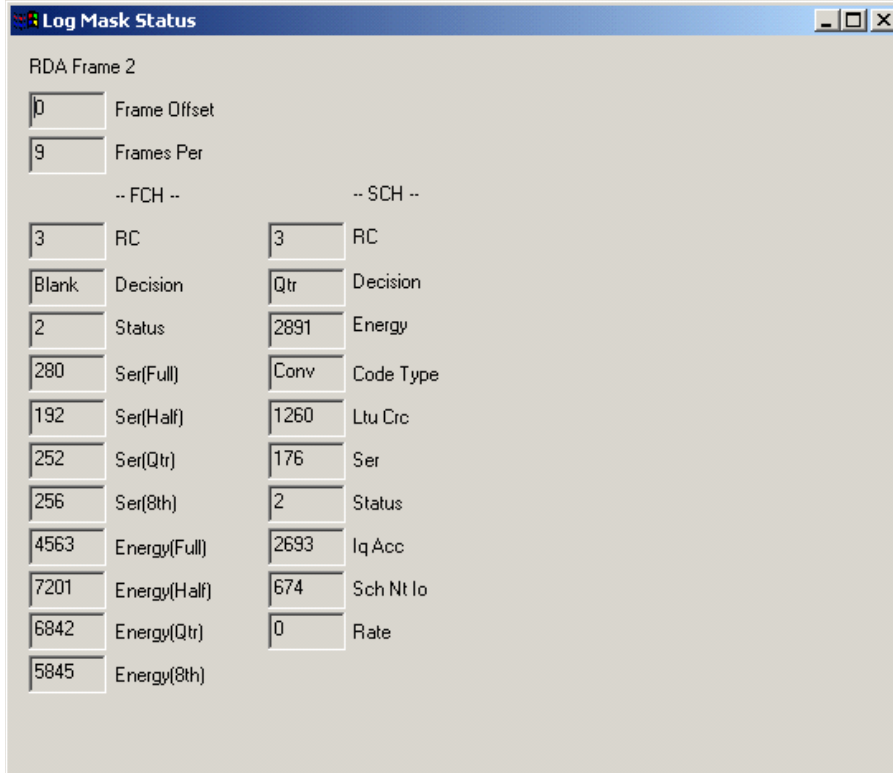


Figure 10-26 Log Mask Status dialog

10.8 1xEV-DO

The 1xEV-DO tool is only supported in CDMA 1x mode. Select Tools → 1xEV-DO, as shown in Figure 10-27.

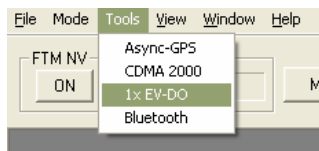


Figure 10-27 Selecting 1xEV-DO

Use the 1xEV-DO window, as shown in Figure 10-28, to display the 1xEV-DO log mask. Click Log Mask and the log mask appears, as shown in Figure 10-29. The log mask displays the log packets that are returned from the target; the dialog window can be resized.

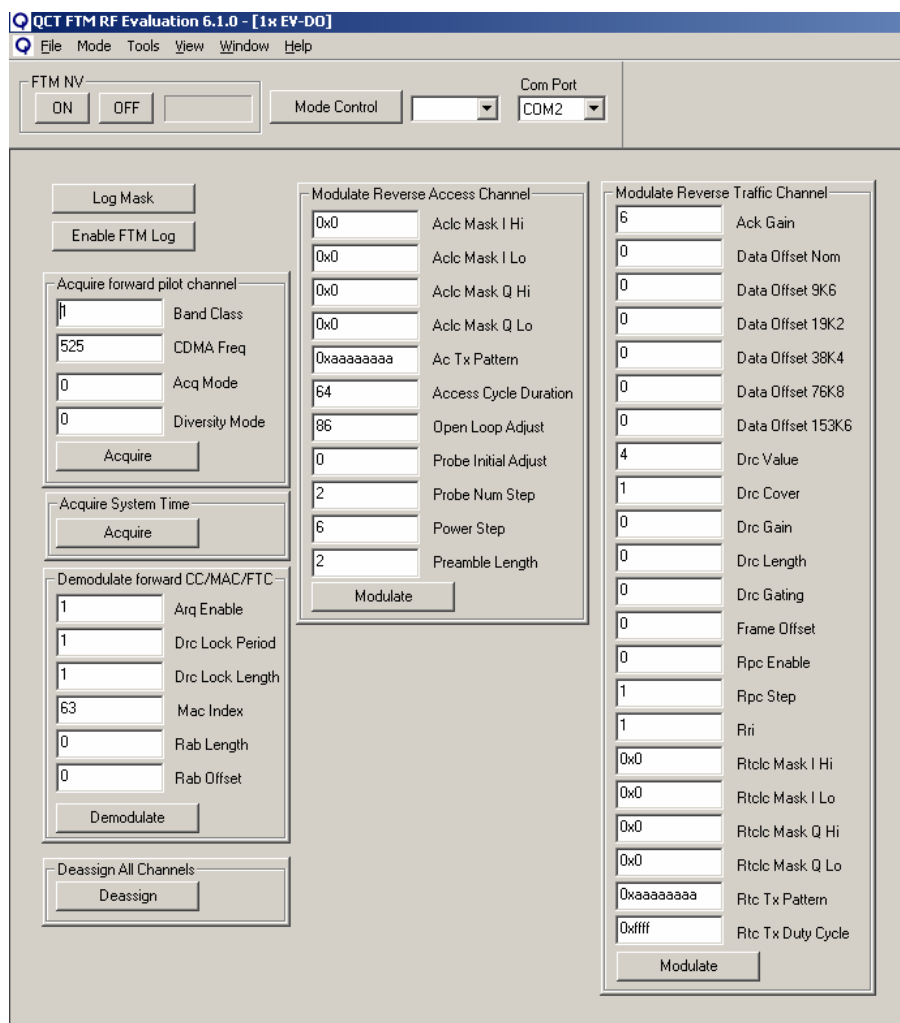
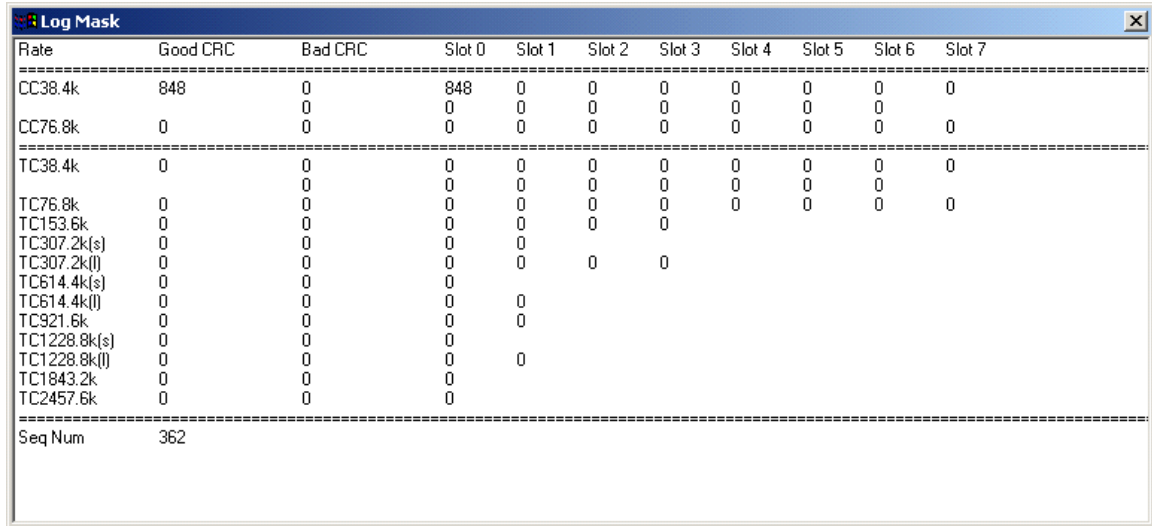


Figure 10-28 1xEV-DO window



Rate	Good CRC	Bad CRC	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
CC38.4k	848	0	848	0	0	0	0	0	0	0
CC76.8k	0	0	0	0	0	0	0	0	0	0
TC38.4k	0	0	0	0	0	0	0	0	0	0
TC76.8k	0	0	0	0	0	0	0	0	0	0
TC153.6k	0	0	0	0	0	0	0	0	0	0
TC307.2k(s)	0	0	0	0	0	0	0	0	0	0
TC307.2k(l)	0	0	0	0	0	0	0	0	0	0
TC614.4k(s)	0	0	0	0	0	0	0	0	0	0
TC614.4k(l)	0	0	0	0	0	0	0	0	0	0
TC921.6k	0	0	0	0	0	0	0	0	0	0
TC1228.8k(s)	0	0	0	0	0	0	0	0	0	0
TC1228.8k(l)	0	0	0	0	0	0	0	0	0	0
TC1843.2k	0	0	0	0	0	0	0	0	0	0
TC2457.6k	0	0	0	0	0	0	0	0	0	0
Seq Num	362									

Figure 10-29 1xEV-DO log mask

10.9 Async GPS

To open the Async GPS window, select Tools → Async-GPS, as shown in Figure 10-30.

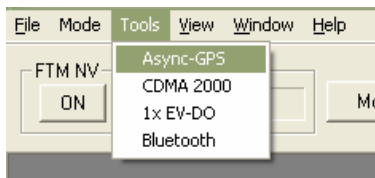


Figure 10-30 Selecting Async GPS

The Async GPS window, as shown in Figure 10-31, consists of three control areas, Self Test, GPS Tests, and GPS IQ Capture, which are described in detail in the following subsections. Click SET IDLE MODE to stop all the tests currently being performed. Click RESET to reset all read-only status boxes.

Set Idle Mode Clear Status

Self Test

Do Self Test

	Results	PASS	FAIL
Memory			
SPT			
Bootcode Chksum			

GPS Tests

Test Parameter	Test	Status
	Standalone Test	
Satellite ID 0	SV Tracking Test	

GPS IQ Capture

Center Freq (Hz) ☐ Auto Center Freq

Start Delay (ms) Sampling Freq

☐ Log IQ to file

Figure 10-31 Async GPS window

10.9.1 Self test controls

The Self Test area is shown in Figure 10-32. Click DO SELF TEST to start a self-test, which could include tests for memory, signal processing, and boot code checksum. The results of the tests will be displayed in the PASS and FAIL boxes.

Self Test

Do Self Test

	Results	PASS	FAIL
Memory			
SPT			
Bootcode Chksum			

Figure 10-32 Async GPS self test

10.9.2 GPS tests controls

The GPS Tests area is shown in Figure 10-33. Click STANDALONE TEST to verify the GPS operation of an AGPS-based MSM in Standalone mode. Click SV TRACKING TEST to process the signal SV tracking continuously.

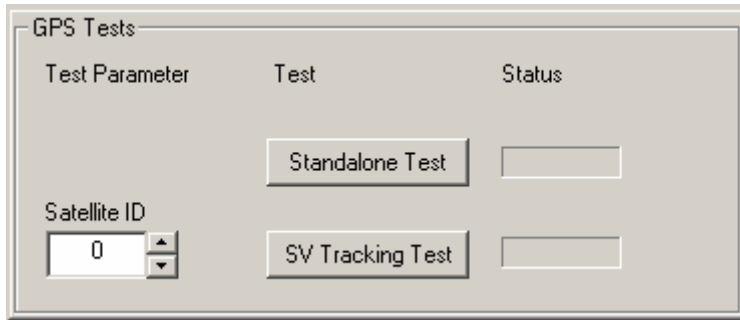


Figure 10-33 Async GPS tests

10.9.3 GPS IQ capture

The GPS IQ Capture area is shown in Figure 10-34. CAPTURE IQ captures a snapshot of the baseband IQ data and stores the data. If the Log IQ to file check box is selected, the IQ data will be saved to a text-based file, which is specified in the edit box. The default file is located in c:\GPS IQ Capture.dat.

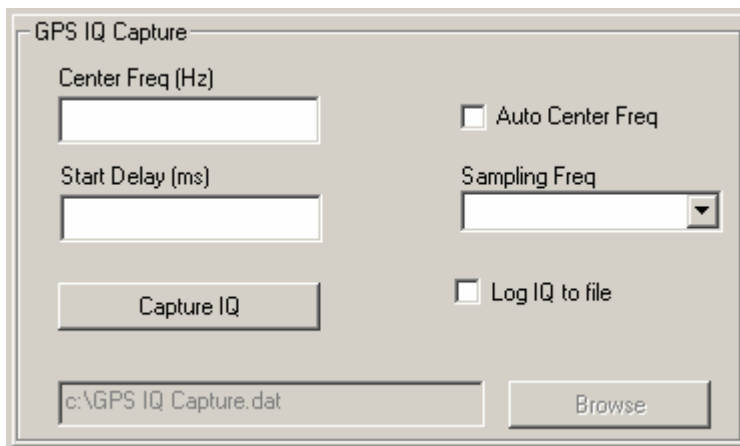


Figure 10-34 Async GPS IQ capture

10.10 Bluetooth

To use the Bluetooth tool, select Tools → Bluetooth, as shown in Figure 10-35.

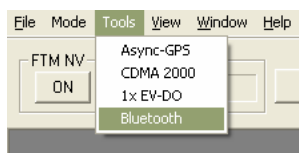


Figure 10-35 Selecting Bluetooth

The Bluetooth page provides a set of commands to enable connection to a Bluetooth test box, as well as a flexible API that allows the user to send any combination of Bluetooth Host Controller Interface (HCI) commands. All responses from the Bluetooth HCI layer will be logged out to the Bluetooth FTM Logs screen. Refer to [Q2] for details.

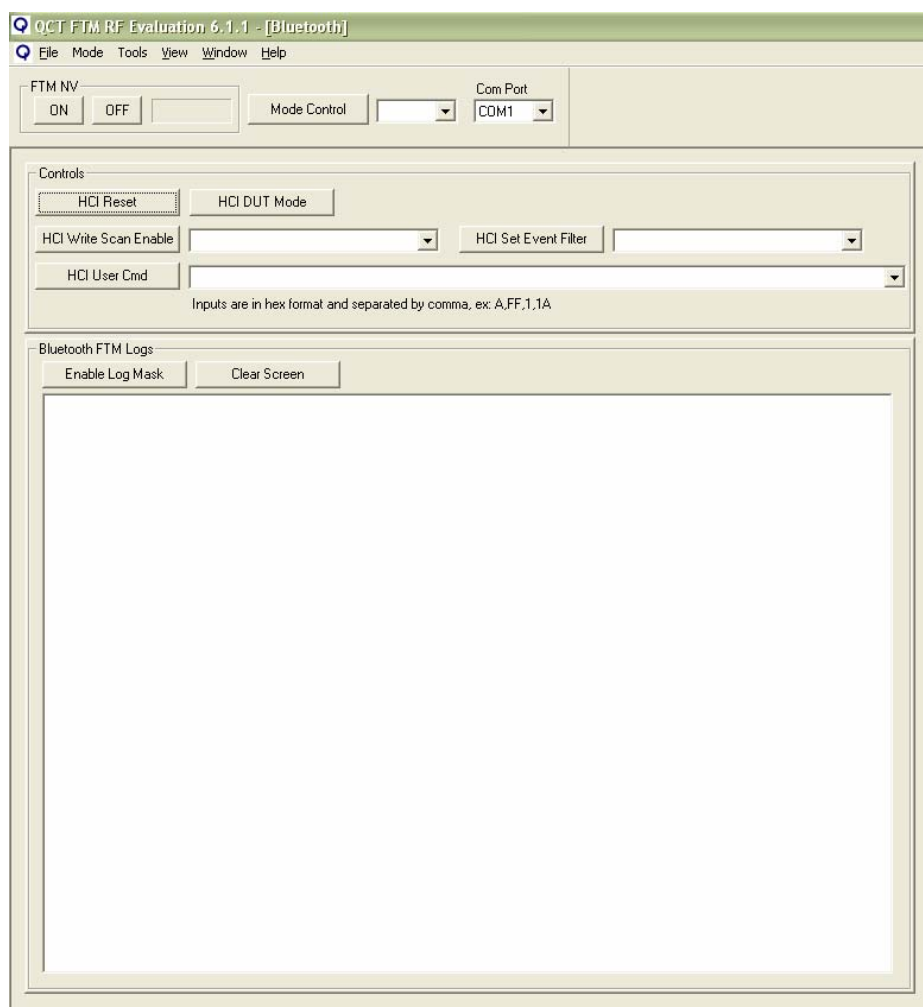


Figure 10-36 Bluetooth FTM logs screen

10.10.1 Controls

The Controls dialog is shown in Figure 10-37.

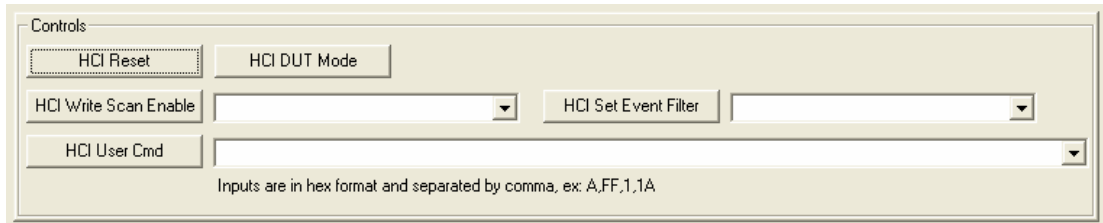


Figure 10-37 Controls dialog

10.10.1.1 HCI Reset

The HCI RESET button is shown in Figure 10-38.

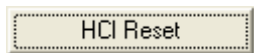


Figure 10-38 HCI Reset button

This command sends an HCI Reset Command to the Bluetooth subsystem.

10.10.1.2 HCI DUT Mode

The HCI DUT MODE button is shown in Figure 10-39.



Figure 10-39 HCI DUT Mode button

This command sends the Enable DUT HCI command to the Bluetooth subsystem.

10.10.1.3 HCI Write Scan Enable

Figure 10-40 shows a sample drop-down menu for the WRITE SCAN ENABLE control.

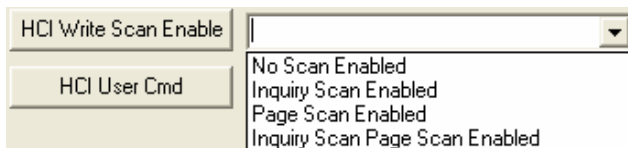


Figure 10-40 HCI write scan enable options

This control sends a Write Scan Mode HCI command to the Bluetooth subsystem to enable or disable different scan modes the Bluetooth device supports.

10.10.1.4 HCI Set Event Filter

Figure 10-41 shows a sample drop-down menu for the HCI SET EVENT FILTER control.

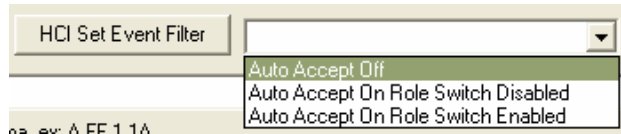


Figure 10-41 HCI set event filter options

This control sends a Set Event Filter command to the HCI subsystem. The type of filter is fixed to be a Connection Setup Filter Type, which accepts incoming connections from all Bluetooth devices.

10.10.1.5 HCI User Cmd

Figure 10-42 shows a sample drop-down menu for the HCI USER CMD.

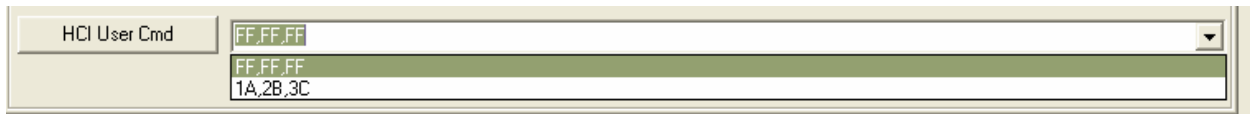


Figure 10-42 HCI user cmd options

This command presents a thin interface to the Bluetooth HCI subsystem. The payload data may be of variable length, which is specified in the FTM command header. No validation of the data packet will be performed. The user must fill out the payload with a valid HCI command or data packet. Refer to [R2], Sections H-1 and H-2, for definition of the HCI layer.

10.10.2 Bluetooth FTM Logs

The Bluetooth FTM Logs window is shown in Figure 10-43.

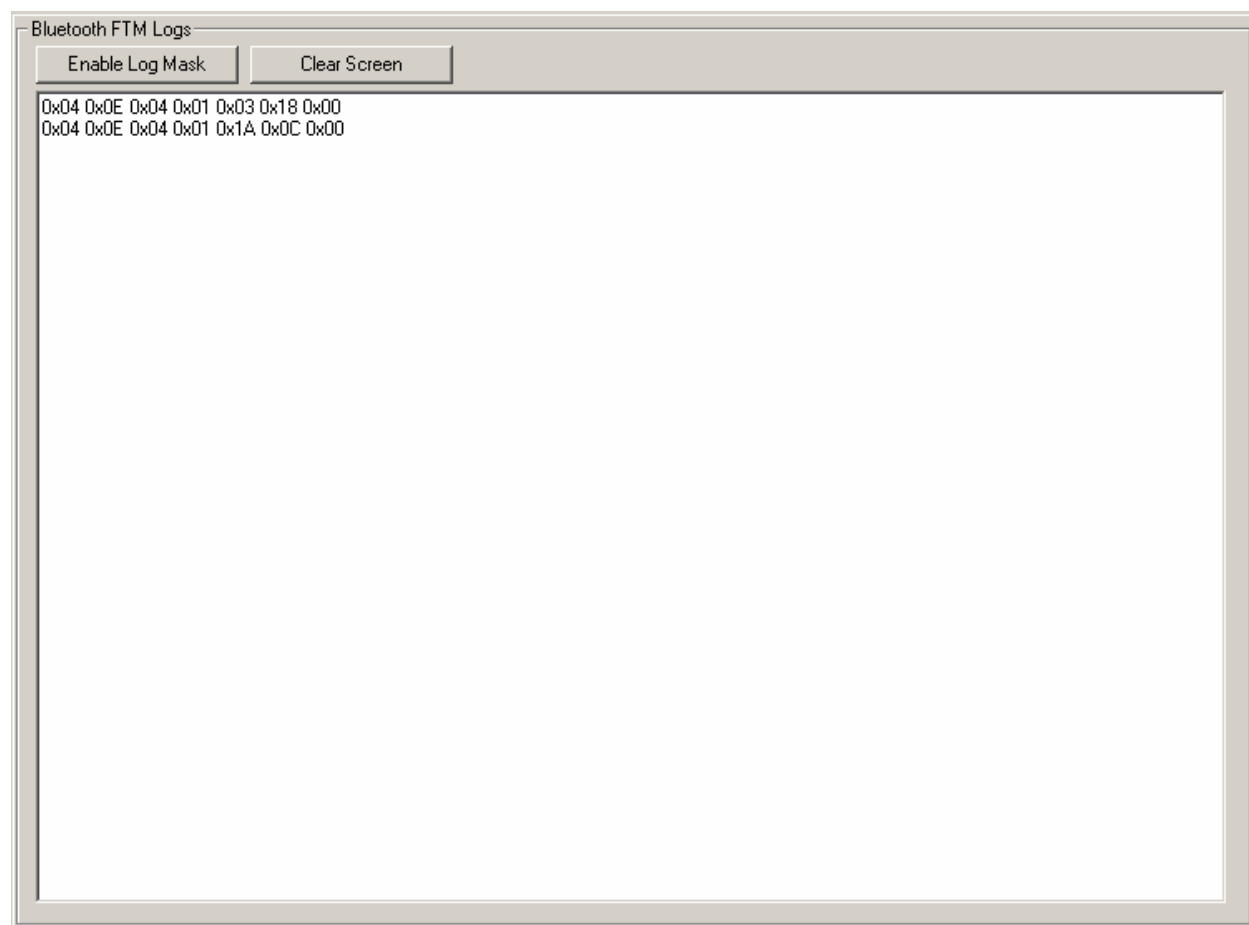


Figure 10-43 Bluetooth FTM logs window

10.10.2.1 Enable Log Mask

The ENABLE LOG MASK button is shown in Figure 10-44.

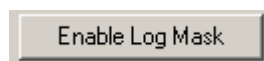


Figure 10-44 Enable log mask button

This command enables the FTM Log Mask.

10.10.2.2 Clear Screen

The CLEAR SCREEN button is shown in Figure 10-45.

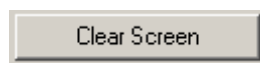


Figure 10-45 Clear Screen button

This command clears the output log screen.

10.10.2.3 Output Log Screen

The payload data is displayed in the output log screen as shown in Figure 10-46.



Figure 10-46 Output log screen

10.11 Camera mode

The Camera mode controls are shown in Figure 10-47. This window consists of three control areas, Camera Flow Chart, Get Param, and Get Sensor Info. Each control area is described in detail in the following subsections.

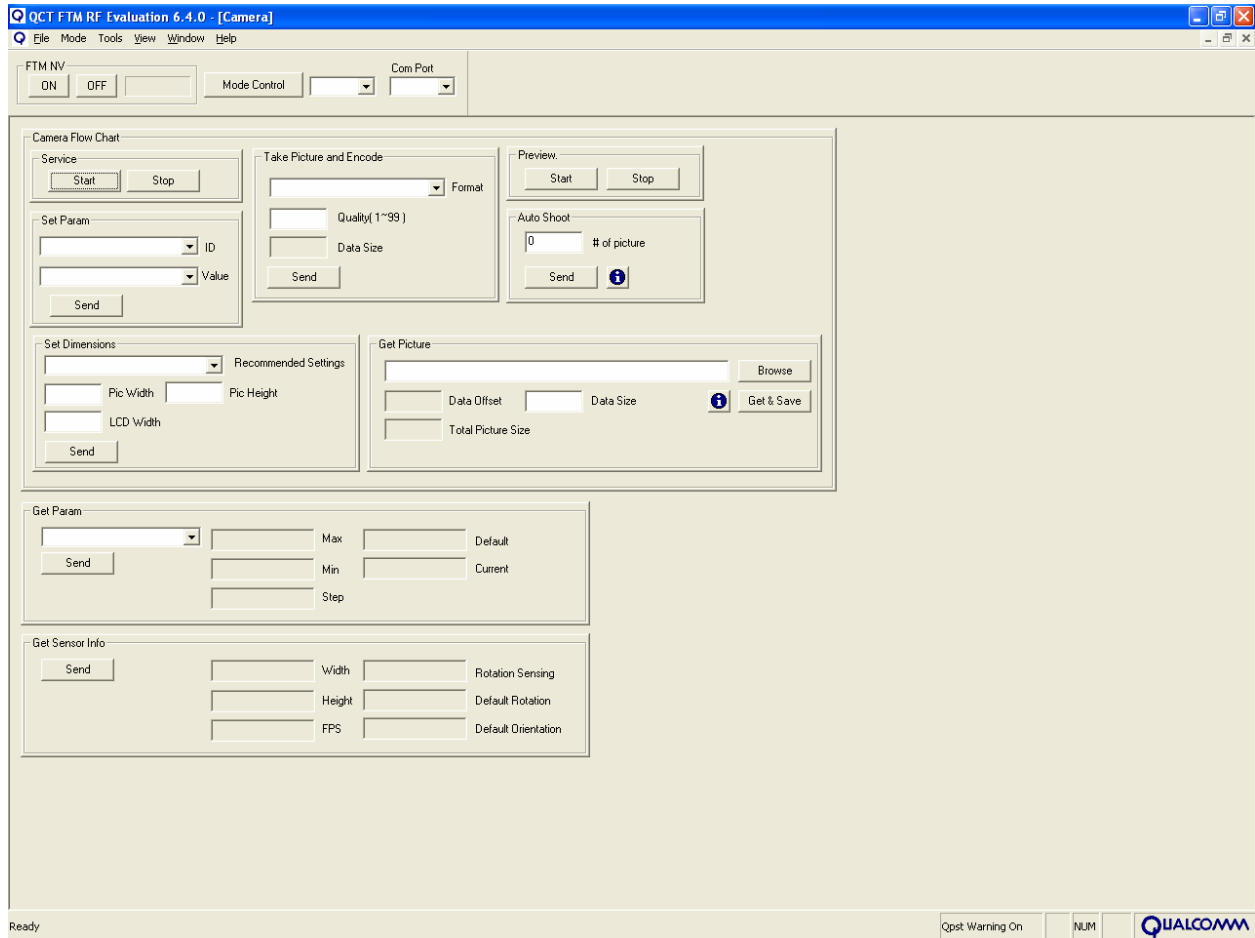


Figure 10-47 Camera mode window

10.11.1 Camera Flow Chart controls

The Camera Flow Chart area, shown in Figure 10-48, consists of:

- Service – see Section 10.5.1.1 for details
- Set Param– see Section 10.5.1.2 for details
- Set Dimensions – see Section 10.5.1.3 for details
- Take Picture and Encode– see Section 10.11.1.4 for details
- Preview – see Section 10.11.1.5 for details
- Get Picture– see Section 10.11.1.6 for details
- Auto Shoot– see Section 10.11.1.7 for details

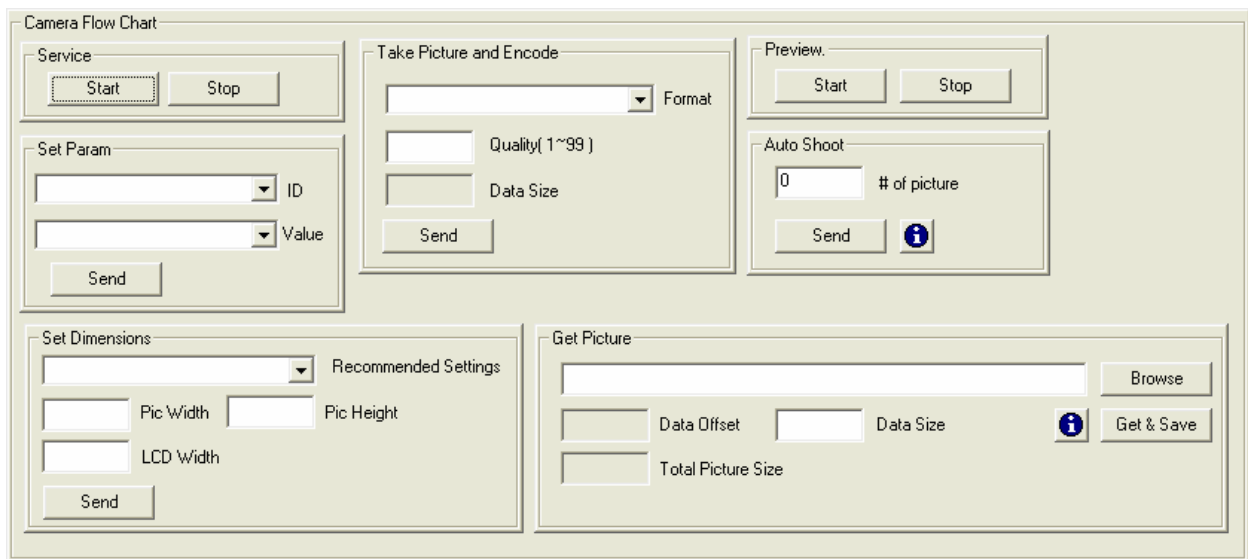


Figure 10-48 Camera Flow Chart area

10.11.1.1 Service

The Service controls provide a means of starting and stopping camera services. START starts the camera services. The power to the sensor is turned on and set to the power-up state for operation. The sensor and the device driver are initialized. Setting picture dimensions and taking pictures cannot happen until this command is executed. STOP terminates the camera services. The power sensor is turned off. This command also deallocates the memory heap allocated for picture storage.

10.11.1.2 Set Param

The Set Param controls are used to set the operational parameters of the camera sensor. For a list of possible parameter identifiers, refer to [Q3].

10.11.1.3 Set Dimensions

The Set Dimensions controls set the picture dimensions. The picture width is the horizontal width of the picture in pixels, and the picture height is the vertical height of the picture in number of lines. The Camera Start command must be executed before using this command.

10.11.1.4 Take Picture and Encode

The Take Picture and Encode controls are used to take the picture, encode it, and save it in the phone's allocated memory heap. The format of the picture can be either raw or JPEG-encoded data stored in the allocated memory buffer. Memory heap is allocated when this command is executed.

10.11.1.5 Preview

The Preview controls are used to start and stop the preview state of camera services.

10.11.1.6 Get Picture

The Get Picture controls are used to retrieve raw or JPEG-encoded picture data from the allocated memory space used in the Camera Take Picture and Encode command, based on a data offset and size.

10.11.1.7 Auto Shoot

Auto Shoot simulates multiple camera shoots. “# of pictures” specifies the number of pictures to be taken. Users are responsible to enter all the necessary parameters before using the Auto Shoot feature. The steps taken in Auto Shoot are:

1. Start camera service.
2. Set the parameter.
3. Set the dimension.
4. Take a picture and encode it.
5. Get a picture and save it to files.
6. Repeat step 5 the specified “# of pictures” times.
7. Stop the camera.

10.11.2 Get Param

The Get Param controls, shown in Figure 10-49, are used to set the operational parameters of the camera sensor. For a list of possible parameter identifiers, refer to [Q3].

Get Param

Send

Max

Default

Min

Current

Step

Figure 10-49 Get Param controls

10.11.3 Get Sensor Info

The Get Sensor Info controls, shown in Figure 10-50, are used to retrieve camera information such as the sensor width, height, rotation, and orientation.

Get Sensor Info

Send

Width

Rotation Sensing

Height

Default Rotation

FPS

Default Orientation

Figure 10-50 Get Sensor Info area

10.12 PMIC

The PMIC3 test commands provide an interface to the low-level device drivers for the PMIC. The PMIC3 controls are divided into the following six areas, as shown in Figure 10-51, that are accessed by tabs in the PMIC3 window: Vreg, Rtc, Interrupt, Charger, Amux, and UI. Each area is described in detail in the following subsections.

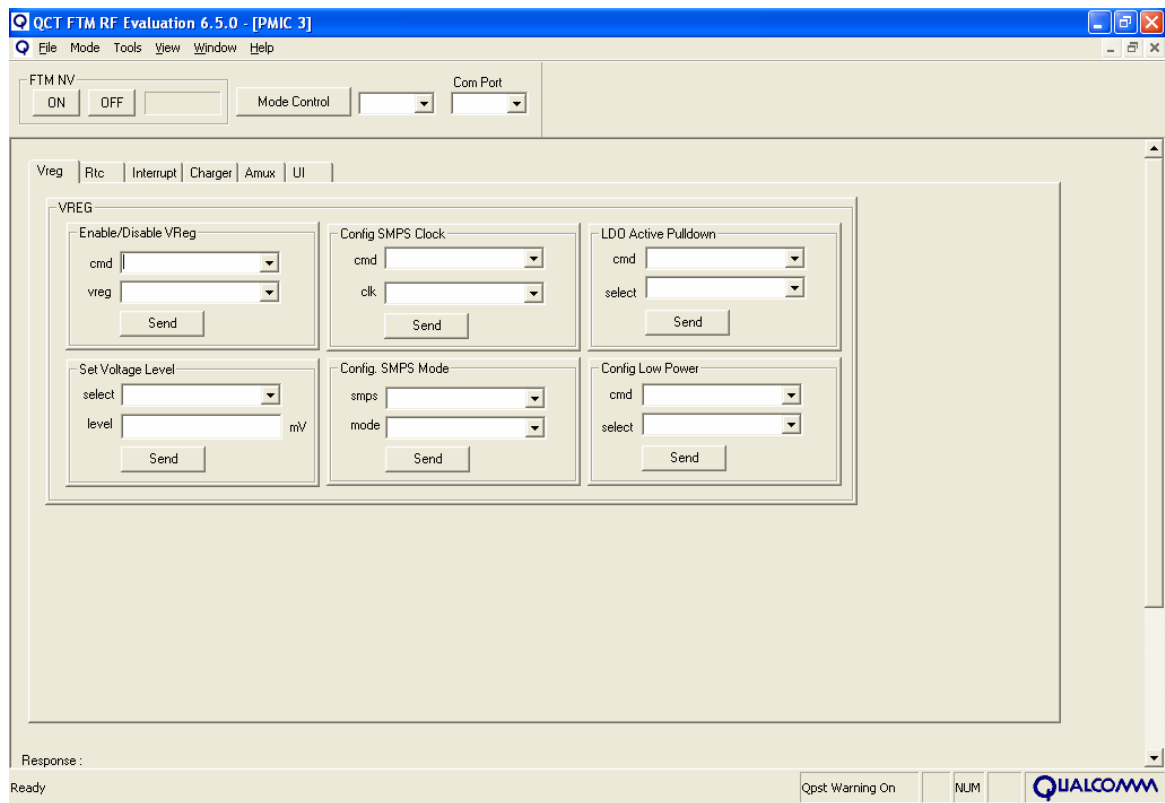


Figure 10-51 PMIC3 window

10.12.1 VREG controls

The VREG area, shown in Figure 10-52, provides the following controls:

- Enable/Disable VReg
- Set Voltage Level
- Config SMPS Clock
- Config SMPS Mode
- LDO Active Pulldown
- Config Low Power

The screenshot shows a GUI window titled 'VREG' containing six sub-panels arranged in a 2x3 grid. Each panel has a title, two dropdown menus, and a 'Send' button.

- Enable/Disable VReg:** 'cmd' dropdown, 'vreg' dropdown, 'Send' button.
- Config SMPS Clock:** 'cmd' dropdown, 'clk' dropdown, 'Send' button.
- LDO Active Pulldown:** 'cmd' dropdown, 'select' dropdown, 'Send' button.
- Set Voltage Level:** 'select' dropdown, 'level' text input with 'mV' unit, 'Send' button.
- Config SMPS Mode:** 'smps' dropdown, 'mode' dropdown, 'Send' button.
- Config Low Power:** 'cmd' dropdown, 'select' dropdown, 'Send' button.

Figure 10-52 VREG area

10.12.1.1 Enable/Disable VReg

The Enable/Disable VReg controls are used to enable or disable one or more voltage regulators.

10.12.1.2 Set Voltage Level

The Set Voltage Level controls set the voltage level of a particular regulator.

NOTE The API may allow a wide range of voltages for each regulator, but the hardware may not support all levels. The user should understand what levels can be tolerated by the hardware before using this command.

10.12.1.3 Config SMPS Clock

The Config SMPS Clock controls are used to select the clock source for the SMPS regulators, or the TCXO divide ratio for the SMPS clock. The user configures the divide ratio prior to configuring the clock source to TCXO.

10.12.1.4 Config SMPS Mode

The Config SMPS Mode controls configure the SMPS mode for the selected SMPS regulator. Not all mode options are available for each regulator.

10.12.1.5 LDO Active Pulldown

The LDO Active Pulldown controls enable or disable the active pull-down for the selected regulator.

10.12.1.6 Config Low Power

The Config Low Power controls enable or disable the low-power mode of the specified regulator.

10.12.2 RTC controls

The RTC area, shown in Figure 10-53, provides the following controls:

- Set or Get Time
- Set or Get Time Adjust
- Set or Get Alarm Time
- Get Alarm Status
- Disable Alarm
- Stop Time

The screenshot shows the RTC control panel with the following sections and controls:

- Set or Get Time:** Includes a 'rw' dropdown, a 'mode' dropdown, and input fields for month, day, year, hour, min, and sec. A 'Send' button is at the bottom.
- Set or Get Time Adjust:** Includes a 'rw' dropdown and a 'time_adj' input field. A 'Send' button is at the bottom.
- Set or Get Alarm Time:** Includes a 'rw' dropdown, an 'alarm_id' dropdown, a 'mode' dropdown, and input fields for month, day, year, hour, min, and sec. A 'Send' button is at the bottom.
- Get Alarm Status:** Includes a 'status' input field and a 'Send' button.
- Disable Alarm:** Includes an 'alarm_id' dropdown and a 'Send' button.
- Stop Time:** Includes a 'Send' button.

Figure 10-53 RTC area

10.12.2.1 Set or Get Time

The RTC Set Time controls start the RTC module (if not started previously) and set the time, given in Julian format. The RTC Get Time controls return the current time, if it was previously activated. Currently, the Get Time command will return the time in 24-hour mode, independent of the user selection.

10.12.2.2 Set or Get Time Adjust

The RTC Set Time Adjust controls are used to correct for crystal variations in the 32.768 kHz sleep clock that drives the RTC. The RTC Get Time Adjust controls return the current setting of the time adjust parameter.

10.12.2.3 Set or Get Alarm Time

The RTC Set Time Alarm command sets the alarm time, given in Julian format. The RTC Get Alarm Time command returns the current alarm time if it was previously activated. Currently, the Get Alarm Time command returns the time in 24-hour mode, independent of the user selection.

10.12.2.4 Get Alarm Status

The RTC Get Alarm Status command is used to determine if any supported alarms have been triggered.

10.12.2.5 Disable Alarm

The RTC Disable Alarm command prevents the selected alarm from triggering.

10.12.2.6 Stop Time

The RTC Stop command stops the RTC module from ticking if it was previously activated.

10.12.3 Interrupt controls

The Interrupt area, shown in Figure 10-54, provides the following controls:

- Get Real Time Status
- Clear IRQ

The screenshot shows a window titled "INTERRUPT". Inside, there are two distinct panels. The top panel is titled "Get Real Time Status" and contains a dropdown menu labeled "id", a text input field labeled "status", and a "Send" button. The bottom panel is titled "Clear IRQ" and contains a dropdown menu labeled "handle" and a "Send" button.

Figure 10-54 Interrupt area

10.12.3.1 Get Real Time Status

The Get Real Time Status command retrieves the real-time (not latched) status of a particular interrupt source. This can be used to obtain the interrupt status if the associated interrupt source has not been configured to generate an interrupt to the MSM. The current FTM PMIC API does not allow the user to enable a particular IRQ in the PMIC. Only the Set RTC Alarm Time command, if sent successfully, will enable the RTC IRQ to test the alarms.

10.12.3.2 Clear IRQ

This command is used to clear a particular IRQ.

10.12.4 AMUX Config controls

The AMUX Config area, shown in Figure 10-55, provides controls for AMUX configuration.

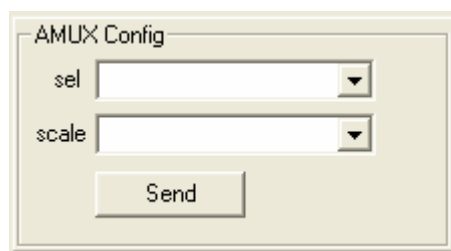


Figure 10-55 AMUX Config area

10.12.4.1 Amux Config

This command sets up the analog MUX to a specified channel and scalar setting.

NOTE The AMSS software may, with no notification to the user, override this setting after this command has been sent for an ADC read on a different channel.

10.12.5 UI controls

The UI area, shown in Figure 10-56, provides the following controls:

- Speaker Config
- Pin Drive Lvl

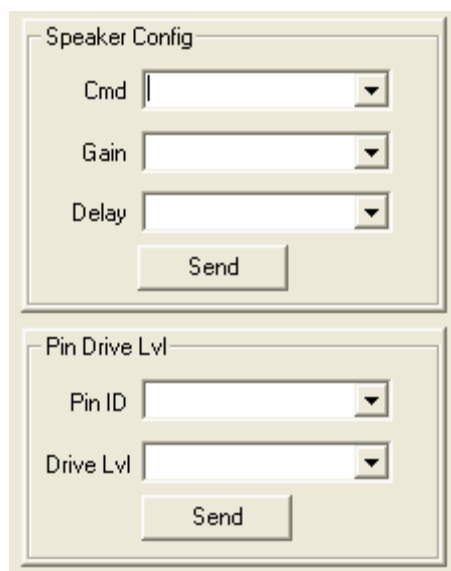


Figure 10-56 UI area controls

10.12.5.1 Speaker Config

This command configures the portion of the audio path that goes through the PMIC. The command supports the ability to enable/disable the speaker, set the speaker gain, and set the speaker delay.

10.12.5.2 Pin Drive Lvl

The PMIC has three high-strength drive pins that are connected to the LCD backlight (LCD_DRV pin), the keypad LEDs (KPD_DRV pin), and the vibrator (VIB_DRV pin). A drive level selection of 0 will turn off the pin drive.

10.13 GSM BER

The GSM BER test commands allow the user to acquire a GSM frequency correction channel (FCCH)/synchronization channel (SCH), decode the broadcast control channel (BCCH) data, acquire a traffic channel (TCH), and loop data back using the user-selected loopback mode. Figure 10-57 illustrates the GSM BER Page layout. Each area is described in detail in the following subsections.

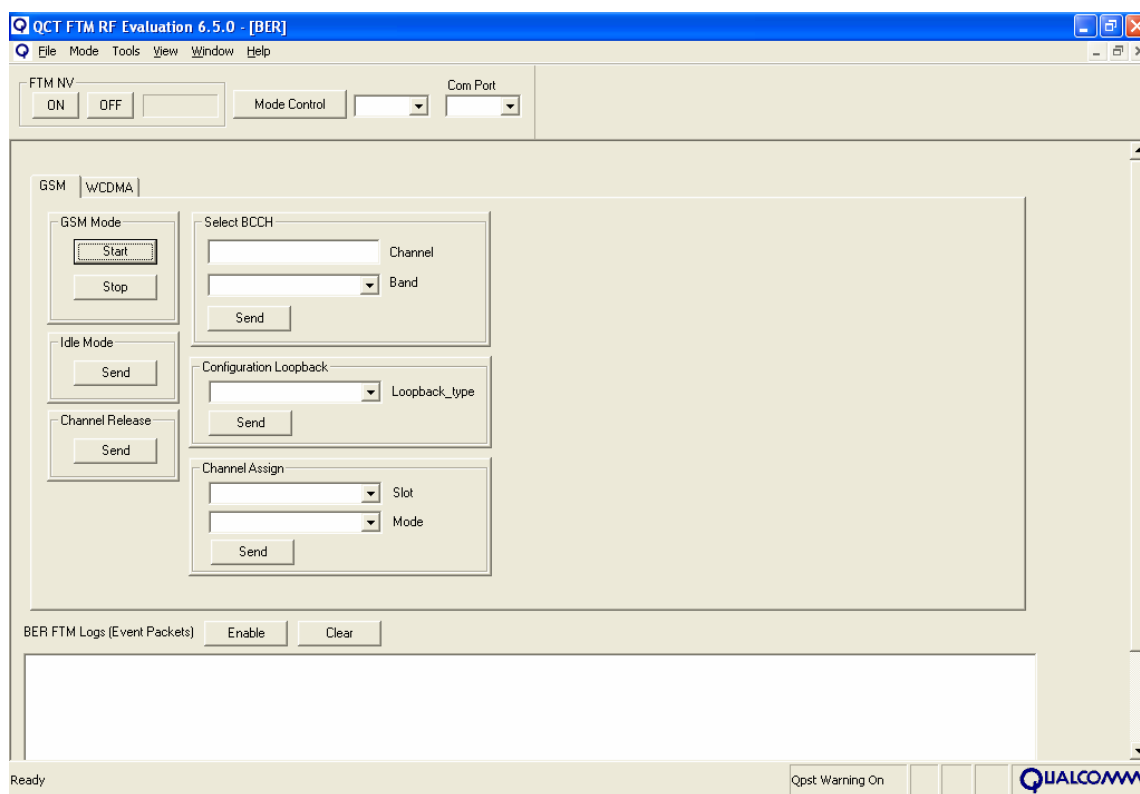


Figure 10-57 GSM BER window

10.13.1 GSM Mode controls

The GSM Mode area, shown in Figure 10-58, provides:

- START button
- STOP button



Figure 10-58 GSM Mode controls

10.13.1.1 Start control

The Start command starts the GSM Layer 1 task from an inactive state. This initializes the Layer 1 subsystem and the necessary drivers.

10.13.1.2 Stop control

The Stop command stops the GSM Layer 1 services and returns to the inactive state. If the user has previously given a Start GSM mode request, the user must issue this command before proceeding to other FTM tests.

10.13.2 Idle Mode control

The Idle Mode command, shown in Figure 10-59, is used when after-system acquisition has succeeded and the UE is decoding BCCH data. This command sets the UE up for GSM Idle mode, where it is camped. The Idle mode parameters are default parameters, since the test box will transmit data on all possible paging channels.

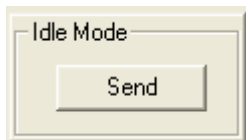


Figure 10-59 Idle Mode control

10.13.3 Channel Release control

The Channel Release command, shown in Figure 10-60, allows the user to release the TCH channel and reacquire the BCCH channel. Prior to issuing this command, the user should disable the Loopback mode, if enabled on the TCH.



Figure 10-60 Channel Release control

10.13.4 Select BCCH controls

The Select BCCH controls, shown in Figure 10-61, allow the user to acquire timing and decode BCCH data on a specific RF channel.

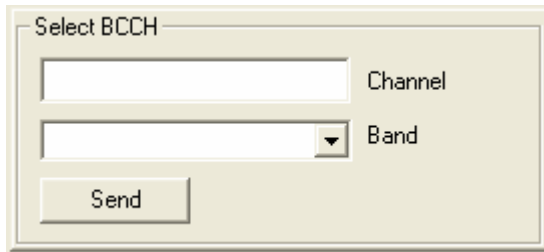


Figure 10-61 Select BCCH controls

10.13.5 Configuration Loopback controls

The Configuration Loopback controls, shown in Figure 10-62, are used to set the UE to one of the supported loopback modes. Currently, the supported modes are Loopback A (TCH loop with signaling of erased frames), Loopback B (TCH loop without signaling of erased frames), and Loopback C (TCH burst by burst). The user should be able to change loopback modes directly, e.g., Loopback C to Loopback A, at any time on the TCH.

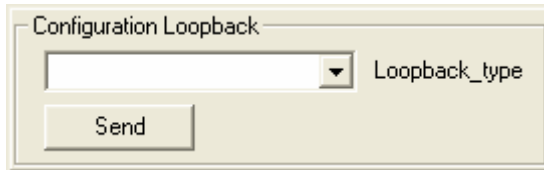


Figure 10-62 Configuration Loopback controls

10.13.6 Channel Assign controls

The Channel Assign controls, shown in Figure 10-63, allow the user to transition from idle mode to TCH mode on a specified time slot and channel mode.

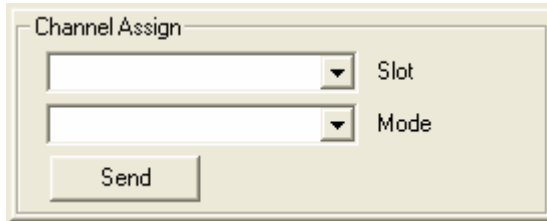


Figure 10-63 Channel Assign controls

10.14 WCDMA BER

The WCDMA BER test commands allow the user to acquire a WCDMA common pilot channel (CPICH), acquire a dedicated physical data channel (DPDCH), and loop back the received bits on the uplink data channel. Figure 10-64 illustrates the GSM BER page layout. Each area is described in detail in the following subsections.

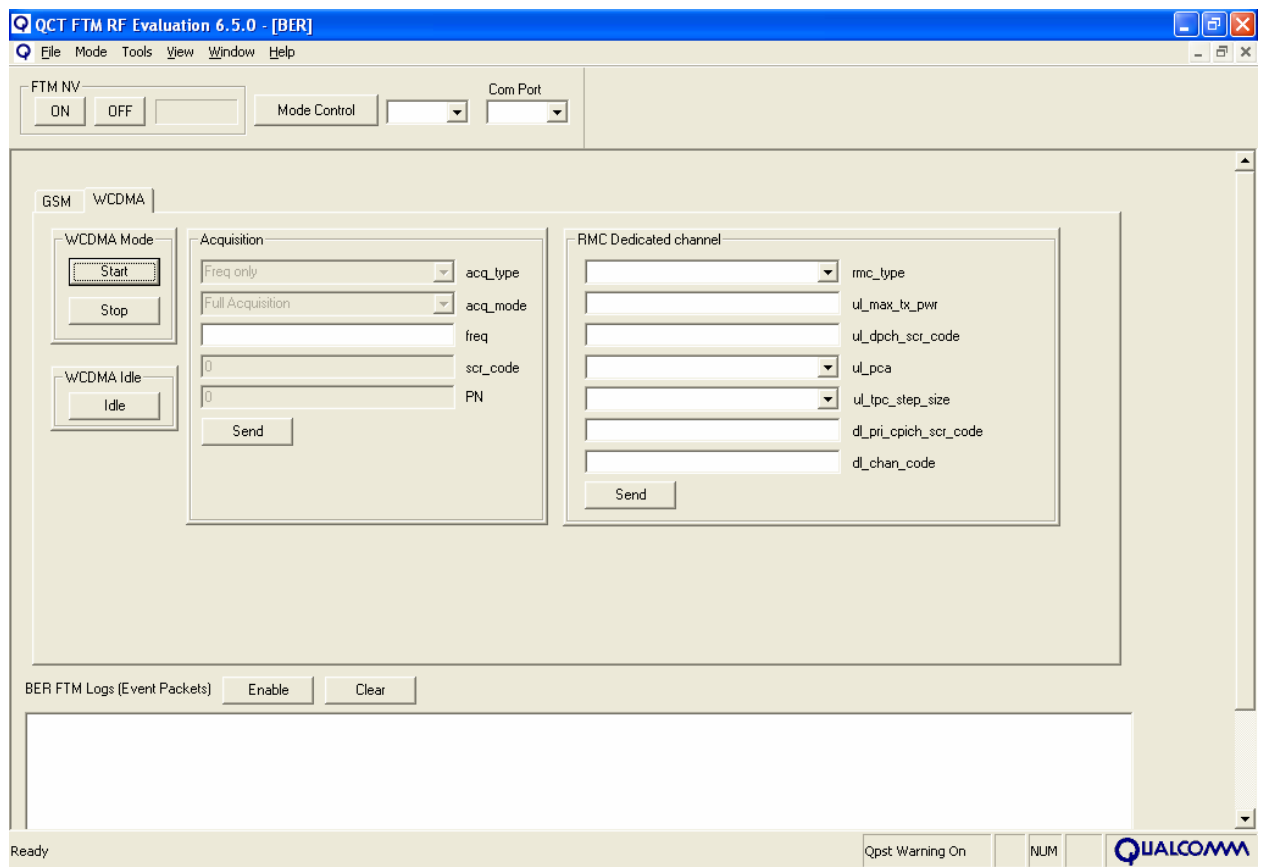


Figure 10-64 WCDMA BER window

10.14.1 WCDMA Mode controls

The WCDMA Mode area, shown in Figure 10-65, consists of:

- START button
- STOP button



Figure 10-65 WCDMA Mode controls

10.14.1.1 Start control

This command starts the WCDMA Layer 1 task from an inactive state. START initializes the Layer 1 subsystem and the necessary drivers.

10.14.1.2 Stop control

This command stops the WCDMA Layer 1 services and returns to the inactive state. If the user has previously given a start WCDMA mode request, the user must issue this command before proceeding to other FTM tests, or entering online mode.

10.14.2 WCDMA Idle control

The WCDMA Idle control, shown in Figure 10-66, tears down all logical channels and the physical channel, returning the physical layer to a default state.

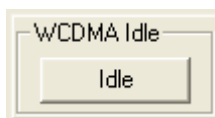


Figure 10-66 WCDMA Idle control

10.14.3 Acquisition control

The Acquisition control, shown in Figure 10-67, is used to acquire a CPICH signal. If successful, it will also set up to decode the P-CCPCH and extract the System Frame Number (SFN) to resolve the Transmission Time Interval (TTI) ambiguity.

Figure 10-67 Acquisition control

10.14.4 RMC Dedicated Channel

The RMC Dedicated Channel controls, shown in Figure 10-68, are used to command the UE to acquire a dedicated channel (DCH). The FTM WCDMA BER feature is meant to be used only with Reference Measurement Channels (RMC). The UE will operate in a Test Loop 2 configuration. Key parameters for the physical layer can be configured using this command.

Figure 10-68 RMC Dedicated Channel controls

10.15 CDMA RF Calibration

10.15.1 Commit Cal to NV control

The Commit Cal to NV control, shown in Figure 10-69, is used to store the current state of the RF calibration into NV. The RF calibration APIs maintain state internally, temporarily recording any receiver calibration updates. When calibration is complete, all values can be written to NV with a single command, eliminating the need to externally compute Rx calibration NV and resend the values to the mobile.



Figure 10-69 Commit Cal to NV control

10.15.2 Calibrate DVGA control

The Calibrate DVGA controls, shown in Figure 10-70, calculate and return the DVGA offset for the current channel of operation. This is a frequency-dependent API, and the DVGA offset returned will be automatically associated with the correct bin in the channel list.

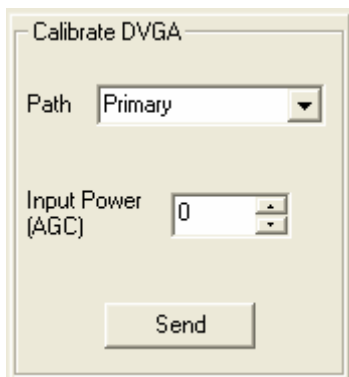


Figure 10-70 Calibrate DVGA controls

10.15.3 Calibrate LNA control

The Calibrate LNA control, shown in Figure 10-71, calculates and returns the LNA offset for a particular gain state for the current channel of operation. This command is a frequency-dependent API, and the LNA offset returned will be automatically associated with the correct bin in the channel list.

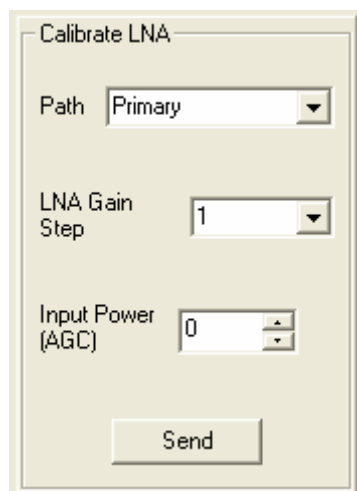


Figure 10-71 Calibrate LNA control

10.15.4 Calibrate IM2 control

The Calibrate IM2 control, shown in Figure 10-72, returns the optimum IM2 value for the current band. This command is a frequency-independent calibration item.

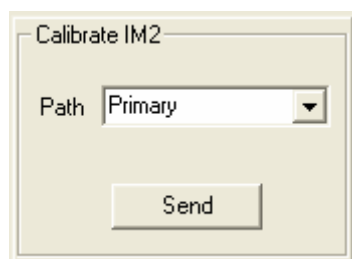


Figure 10-72 Calibrate IM2 control

10.15.5 Calibrate Intelliceiver

The Calibrate Intelliceiver controls, shown in Figure 10-73, calibrate the internal circuitry of IntelliCeiver™ chips. This command is a frequency-independent calibration item.

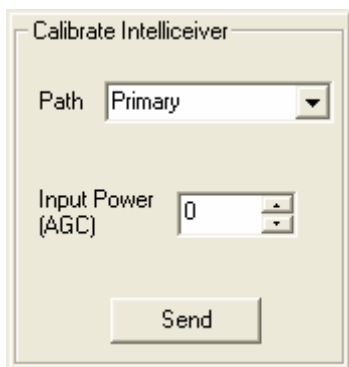


Figure 10-73 Calibrate Intelliceiver controls

11 Gang Flash Image Application

NOTE Numerous changes were made in this section. It should be read in its entirety.

The QPST Gang Image Tool is used to create a binary file suitable for use by an offline programmer, such as Data I/O ProLINE RoadRunner™ or Data I/O FlashPAK™.

11.1 Setup

The tool requires a golden phone to be connected by a data cable to the computer hosting the tool. The golden phone is programmed with a boot loader and AMSS image by JTAG or QPST Software Download. The phone is also loaded with EFS files and NV items by other QPST tools, e.g., EFS Explorer and Software Download.

11.2 Operation

To start the QPST Gang Image Tool:

1. Copy the target AMSS build to your computer.
2. Refer to Section 11.3 for instructions on creating QPSTbuild.mbn configuration file.
3. Connect a working phone to the computer using USB or serial cable.

NOTE The tool can also work without a connected phone if extraction of the EFS file is not required.

4. Select Start → Programs → QPST → Gang Flash Image Application.

5. Under the Select MSM tab, use the pull-down list to select the appropriate MSM chip (Figure 11-1).



Figure 11-1 MSM chip selection

6. Under the Boot Mode tab, select the appropriate radio button to configure the boot mode (Figure 11-2).



Figure 11-2 Boot mode selection

7. Under the Select AMSS tab, use BROWSE to navigate to amss.mbn in the target build (Figure 11-3).

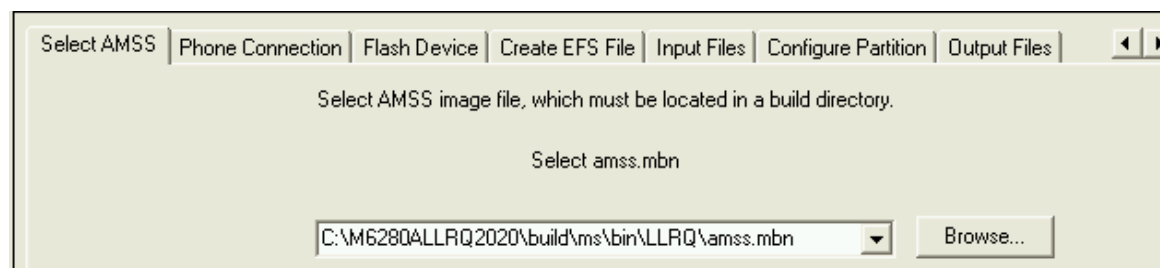


Figure 11-3 AMSS image file selection

NOTE If you wish to initialize the Flash device's EFS partition, perform steps 8 through 11. Otherwise, skip to step 12 and deselect the EFS Image checkbox.

8. Under the Phone Connection tab, use BROWSE to locate the connected phone (Figure 11-4).



Figure 11-4 Phone connection

9. Select the COM port where the phone is connected, then click OK (Figure 11-5).

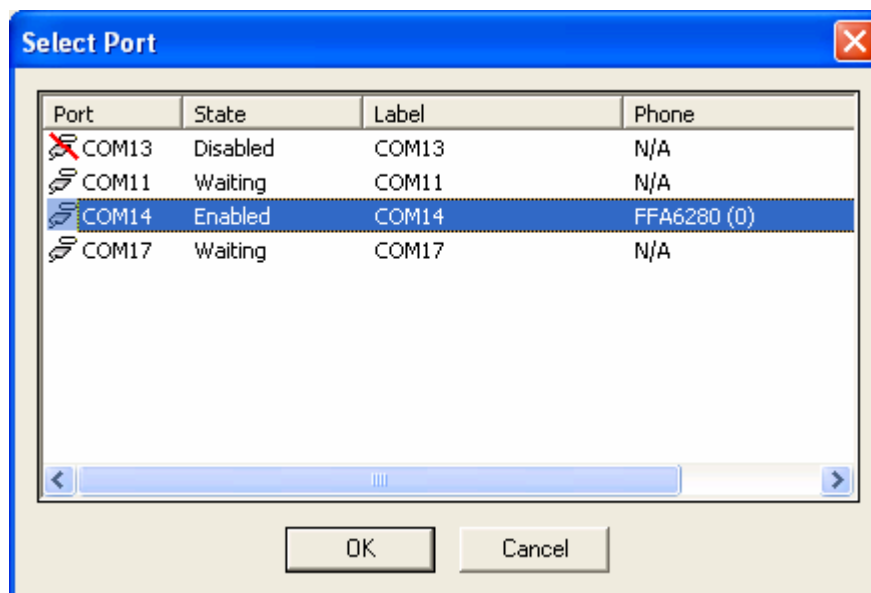


Figure 11-5 COM port selection

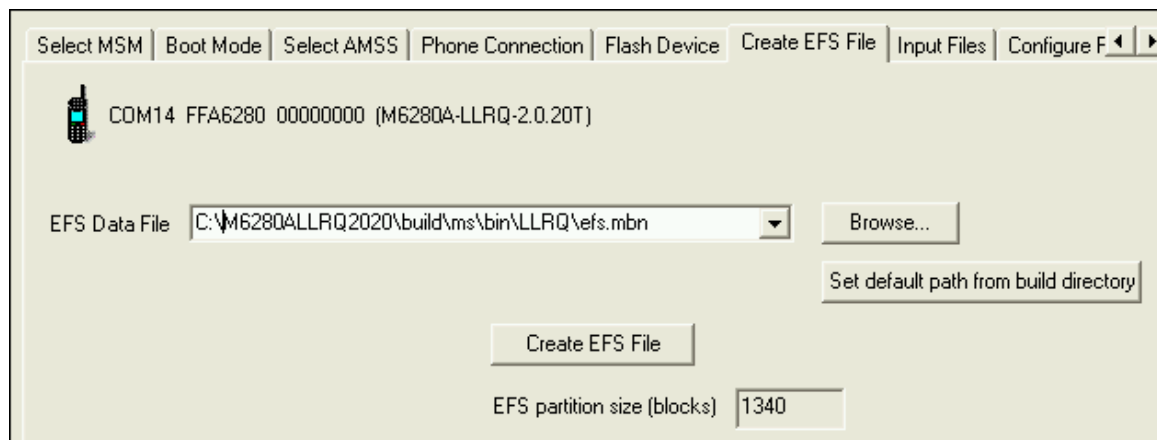
10. Under the Flash Device tab, select the appropriate radio button to read the Flash device type from the connected phone or from a build directory (Figure 11-6).

Figure 11-6 Flash device selection

If Read Flash Info from Phone is selected, the dialog shown in Figure 11-7 may appear. Enter the device size in blocks or megabytes and click OK.

Figure 11-7 Flash device size dialog

- 1 11. Under the Create EFS File tab, BROWSE may be used to select a file other than the default
2 value of efs.mbn. Click CREATE EFS FILE. After the EFS file has been extracted, the EFS
3 partition size will be displayed as shown in Figure 11-8.



4
5 **Figure 11-8 EFS file selection**

12. Under the Input Files tab, remove the check marks beside the SIM Secure Image and the FOTA Image file names (Figure 11-9).

The screenshot shows the 'Input Files' tab of the Gang Flash Image Application. The interface includes a 'Set all to defaults' button and a list of input files with checkboxes and file paths. The 'SIM Secure Image' and 'FOTA Image' checkboxes are unchecked, while others are checked. The 'Cust Image' and 'Cust2 Image' fields are partially obscured by black boxes.

File Name	Path	Selected
(OTP) Boot Loader		☐
Primary Boot	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\pbl.mbn	☒
QC SBL Header and Config Data	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\qcsblhd_cfgdata.mbn	☒
MBIB Page 1	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\partition.mbn	☒
Page 3	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\oemsblhd.mbn	☒
Page 4	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\amsshd.mbn	☒
Page 5		☐
Page 6		☐
QC SBL Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\qcsbl.mbn	☒
OEM SBL Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\oemsbl.mbn	☒
SIM Secure Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\simsecure.mbn	☐
AMSS Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\amss.mbn	☒
APPS Image		☐
FOTA Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\fotaui.mbn	☐
Cust Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\cust.mbn	☐
EFS Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\efs.mbn	☒
Cust2 Image	C:\M6280ALLRQ2020\build\ms\bin\LLRQ\cust2.mbn	☐

Figure 11-9 Input files deselection

13. Under the Configure Partition tab, use the radio button to select Hex Radix. The partition name, start address, maximum length, and actual length are shown (Figure 11-10).

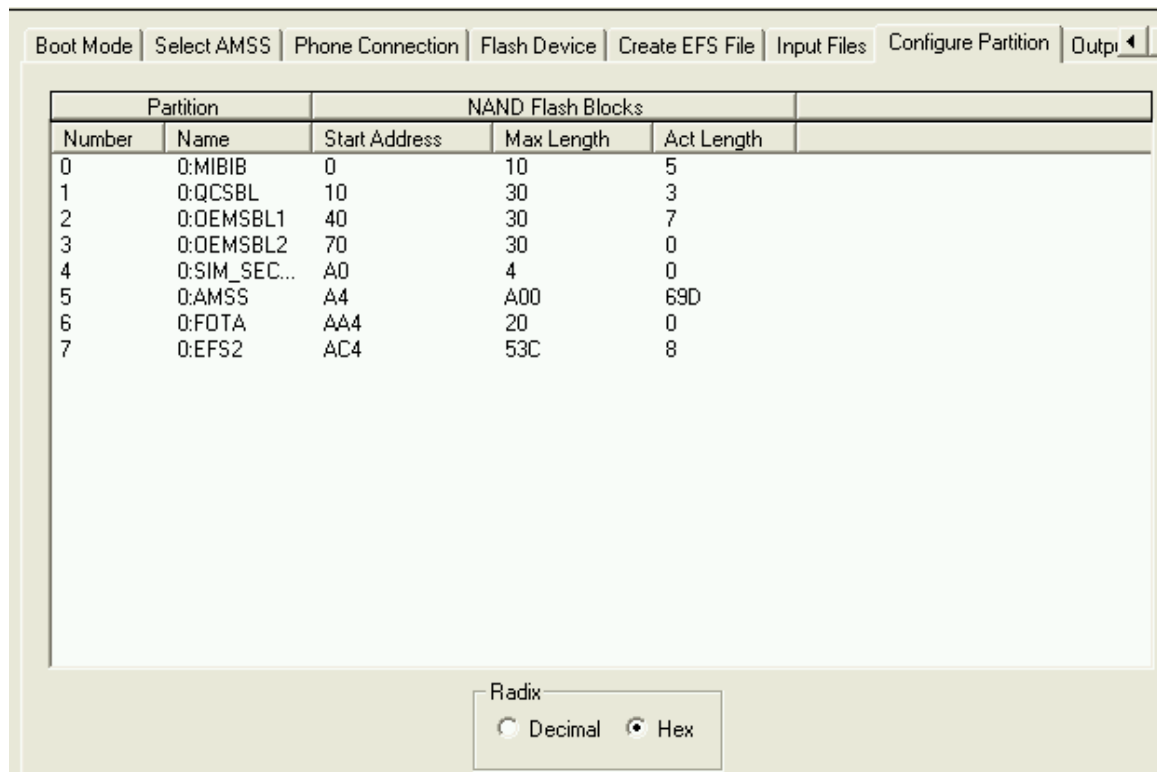


Figure 11-10 Partition configuration

14. Under the Output Files tab, change the file names if desired. Click BUILD FACTORY IMAGE to build the output files (Figure 11-11).

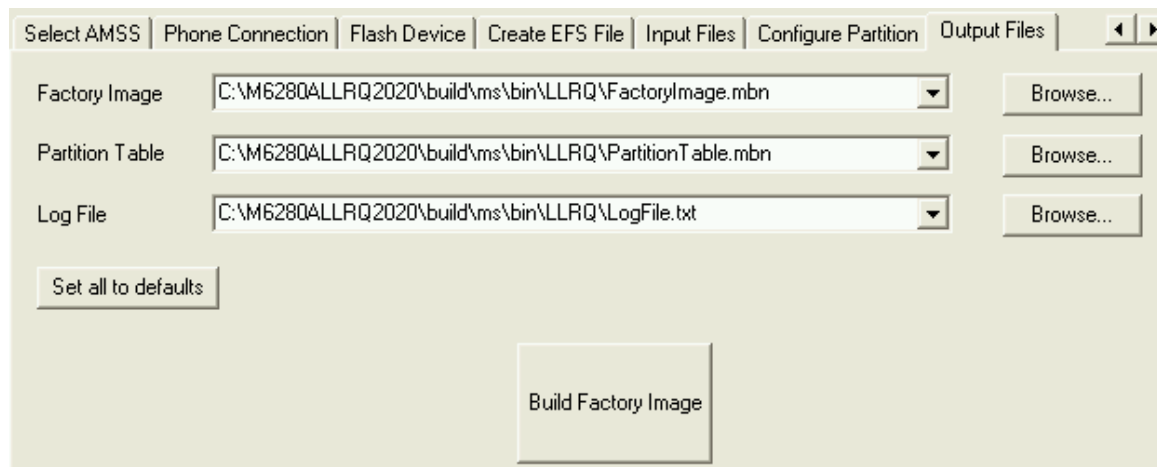


Figure 11-11 Factory image dialog

11.3 Creating QPSTbuild.mbn configuration file

1. Refer to Section 11.4 to verify correct installation of Perl TK on your computer.
2. Copy MakeQPSTbuild.pl and FileBinAccess.pl from C:\Program Files\QPST\bin to the target build directory, \build\ms\bin\<buildID>\.
3. Open the DOS window and navigate to the target build directory, \build\ms\bin\<buildID>\.
4. In the command line, type **perl MakeQPSTbuild.pl**.
5. Select the Single_Boot or Multi_Boot radio button (Figure 11-12).

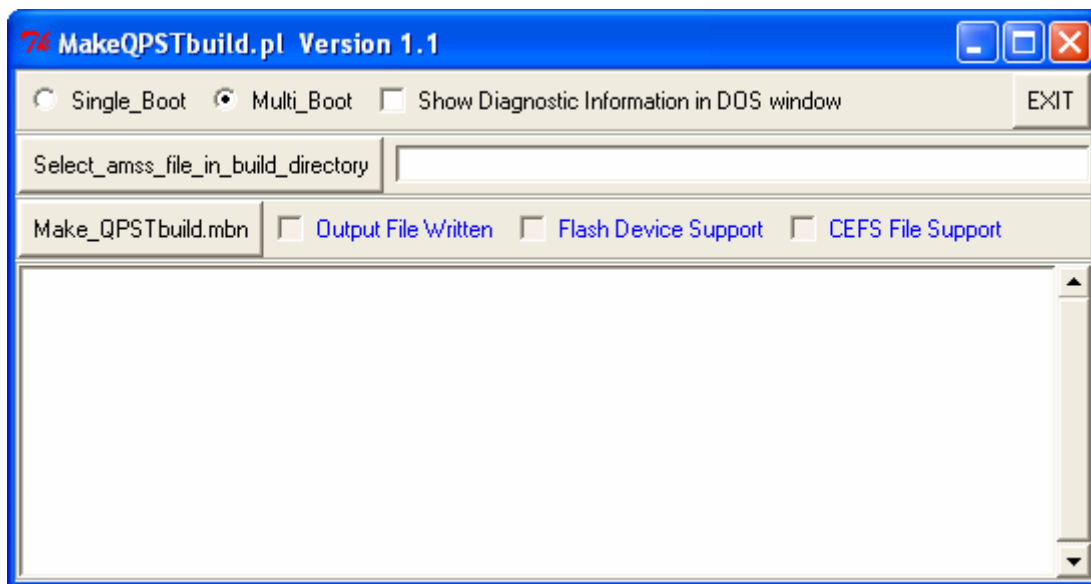


Figure 11-12 MakeQPSTbuild.pl dialog

6. Click SELECT_AMSS_FILE_IN_BUILD_DIRECTORY and select amss.mbn in the build directory (Figure 11-13).

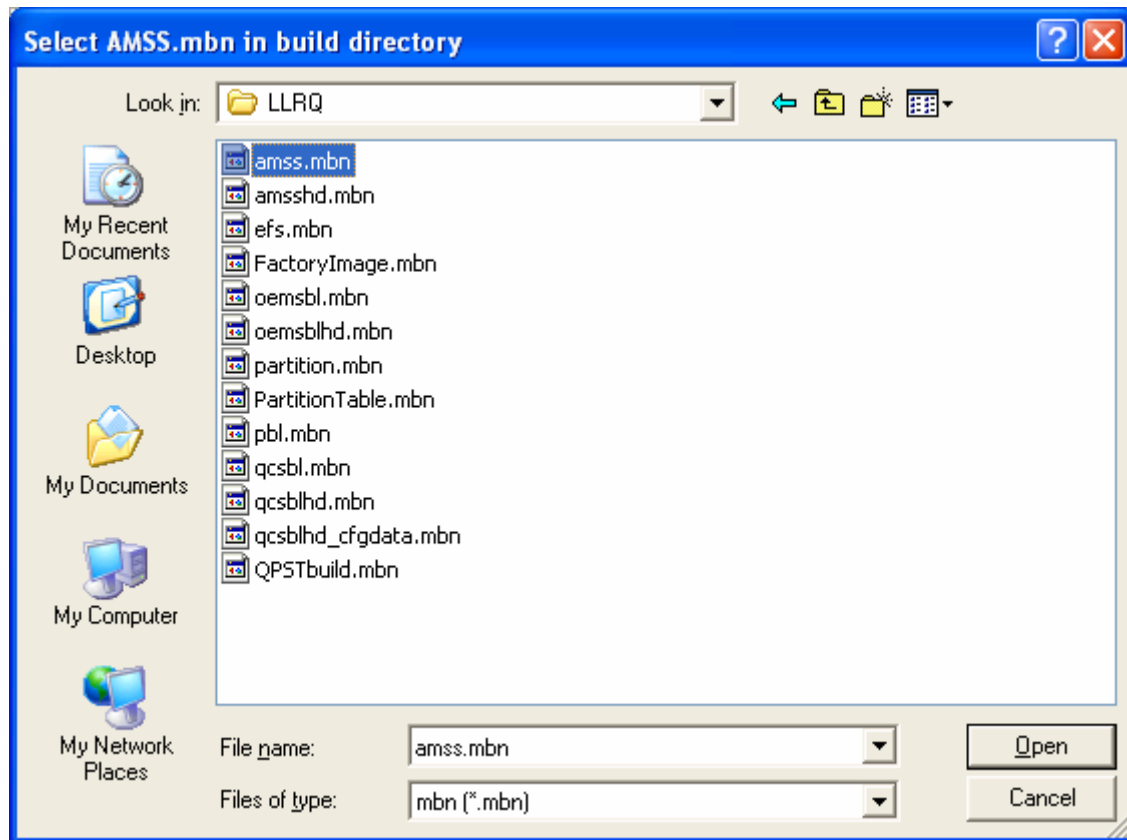


Figure 11-13 Build directory dialog

7. Click MAKE_QPSTBUILD.MBN. The list of supported Flash devices will be displayed. Status checkboxes show the results of the make process (Figure 11-14).

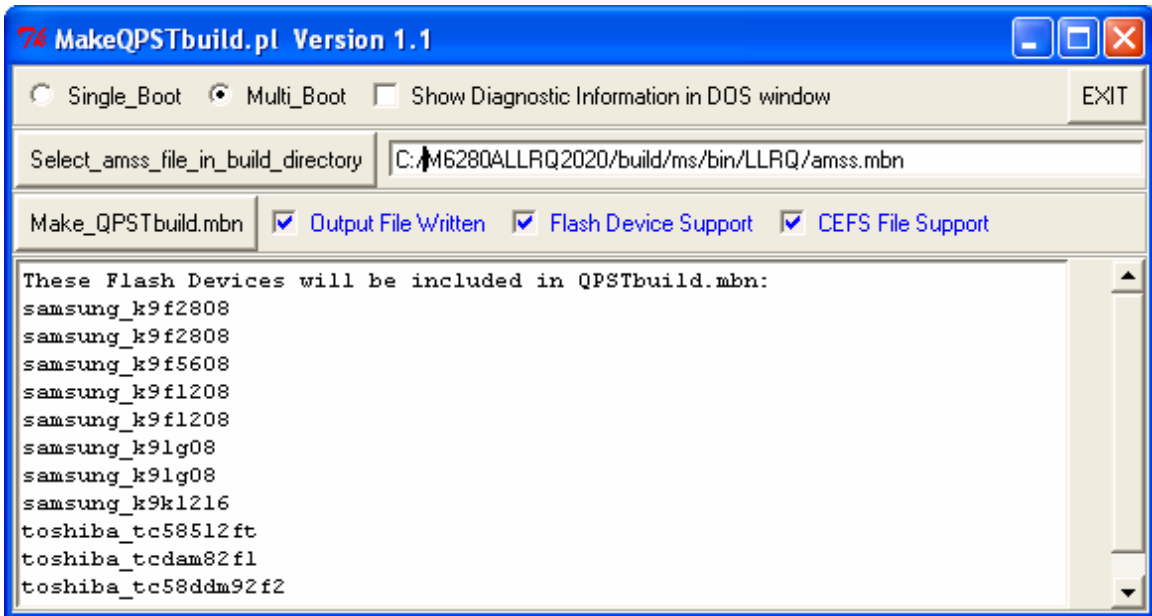


Figure 11-14 Make process results

8. Click EXIT.
9. Verify that QPSTbuild.mbn has been written to the target build directory, \build\ms\bin\<buildID>\.

11.4 Perl and Perl TK installation

1. Verify that Perl has been properly installed by entering the following in a DOS window:

```
perl -v
```

You should see the display shown in Figure 11-15.

```
C:\>perl -v

This is perl, v5.6.1 built for MSWin32-x86-multi-thread
(with 1 registered patch, see perl -U for more detail)

Copyright 1987-2001, Larry Wall

Binary build 635 provided by ActiveState Corp. http://www.ActiveState.com
Built 15:34:21 Feb  4 2003

Perl may be copied only under the terms of either the Artistic License or the
GNU General Public License, which may be found in the Perl 5 source kit.

Complete documentation for Perl, including FAQ lists, should be found on
this system using 'man perl' or 'perldoc perl'.  If you have access to the
Internet, point your browser at http://www.perl.com/, the Perl Home Page.
```

Figure 11-15 Perl verification

2. If you do not have MSWin32-x86-multi-thread installed, download from Active State. Hold down CTRL and click the following link:

<http://www.activestate.com/Products/Download/Download.plex?id=ActivePerl>

The screen shown in Figure 11-16 will appear. Select ActivePerl 5.6.1.638 Windows MSI 8.5MB. Save this file to your desktop.

ActivePerl 5.8.8.816		Installation Notes The Windows AS Package provides NO uninstall functionality, and is recommended only if you are unable to install ActivePerl using the MSI installer. Windows Installer 2.0+ is required for Windows. - download for 9x/Me - download for NT ActivePerl source distributions are also available: - build 816 (.tgz) - build 816 (.zip) - AP816_diff.txt - build 638 (.tgz) - build 638 (.zip) - AP638_diff.txt
AIX		
AS package	18.3MB	
HP-UX		
AS package *		
Linux		
AS package	15.6MB	
DEB	19.3MB	
RPM **	19.6MB	
Mac OS X		
DMG	25.4MB	
Solaris 2.6+		ActivePerl 5.6.1.638 ActivePerl 5.6.1.638 addresses an identified security issue related to win32_stat. Although exposure is rare, ActiveState is providing a patch here and to core Perl because the issue could result in data loss. * ActivePerl for HP-UX is provided as an always-installed product on all PA-RISC and Itanium systems that run the HP-UX 11i Operating Environment. See http://www.hp.com/go/perl for more details. ** Do not install the ActivePerl RPM on Red Hat Linux 8.0. A bug in the current Red Hat distribution may corrupt the RPM database. Instead, use the tarball distributions of ActivePerl (.tar.gz). The Red Hat team has been advised of this issue. For more information, see the RedHat Bug Tracking System . Archive of older releases
AS package (SPARC)	17.1MB	
AS package (x86)	15.6MB	
pkgadd (SPARC)	20.9MB	
pkgadd (x86)	19.3MB	
Windows		
AS package	12.9MB	
MSI	12.8MB	
ActivePerl 5.6.1.638		
Linux		
AS package	9.4MB	
DEB	12.1MB	
RPM*	12.1MB	
Solaris		
AS package	9.5MB	
pkgadd	9.5MB	
Windows		
AS package	8.3MB	
MSI	8.5MB	

Figure 11-16 ActivePerl download

3. After the file has been downloaded, double-click the installer file to begin installation (Figure 11-17).

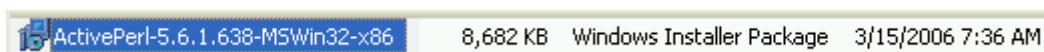


Figure 11-17 ActivePerl installation

4. At the security warning, select RUN (Figure 11-18).

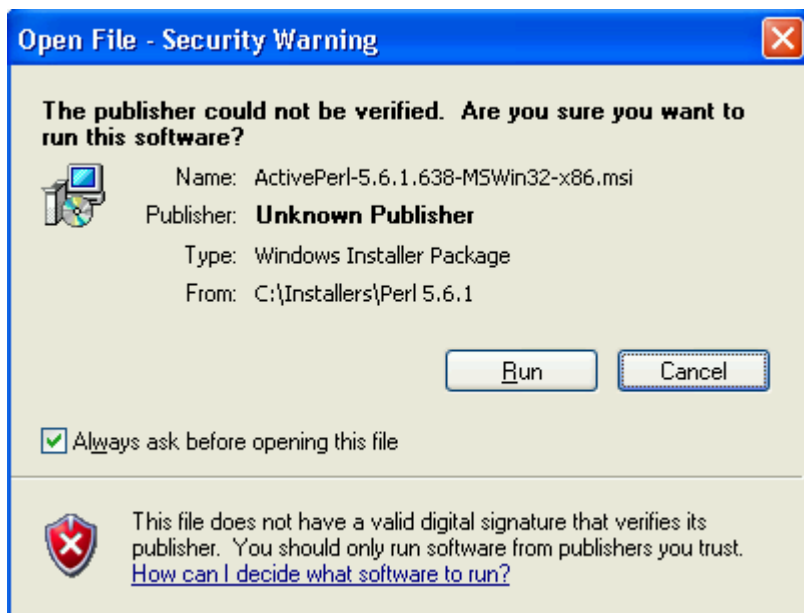


Figure 11-18 Open file dialog

5. When the Setup dialog appears, click NEXT (Figure 11-19).

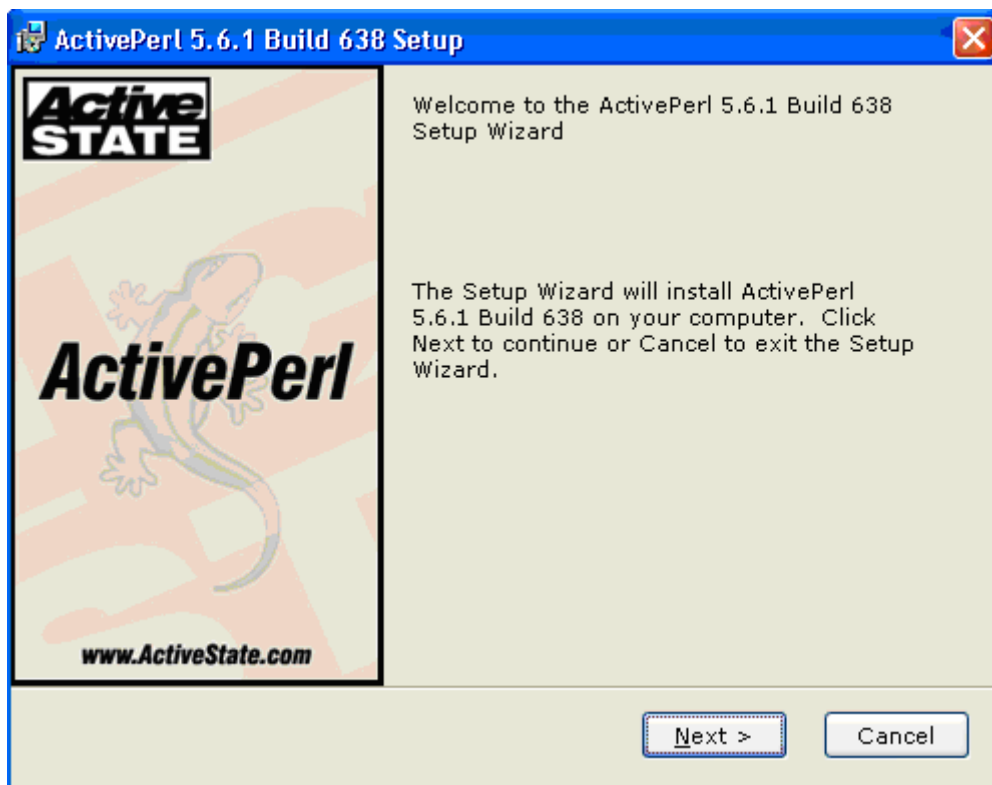


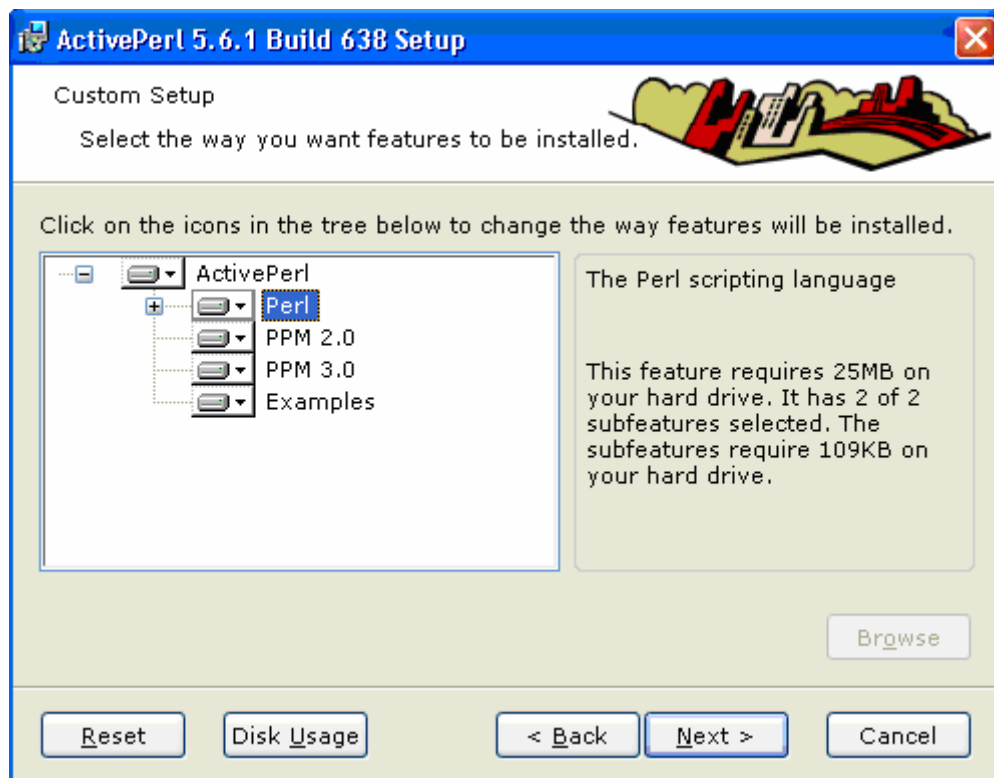
Figure 11-19 ActivePerl setup dialog

6. At the License Agreement dialog, select “I accept” and click NEXT (Figure 11-20).



Figure 11-20 License Agreement dialog

- 1 7. Click NEXT (Figure 11-21).



2

3 **Figure 11-21 Custom Setup dialog**

8. Click NEXT (Figure 11-22).



Figure 11-22 New features dialog

9. Click NEXT (Figure 11-23).

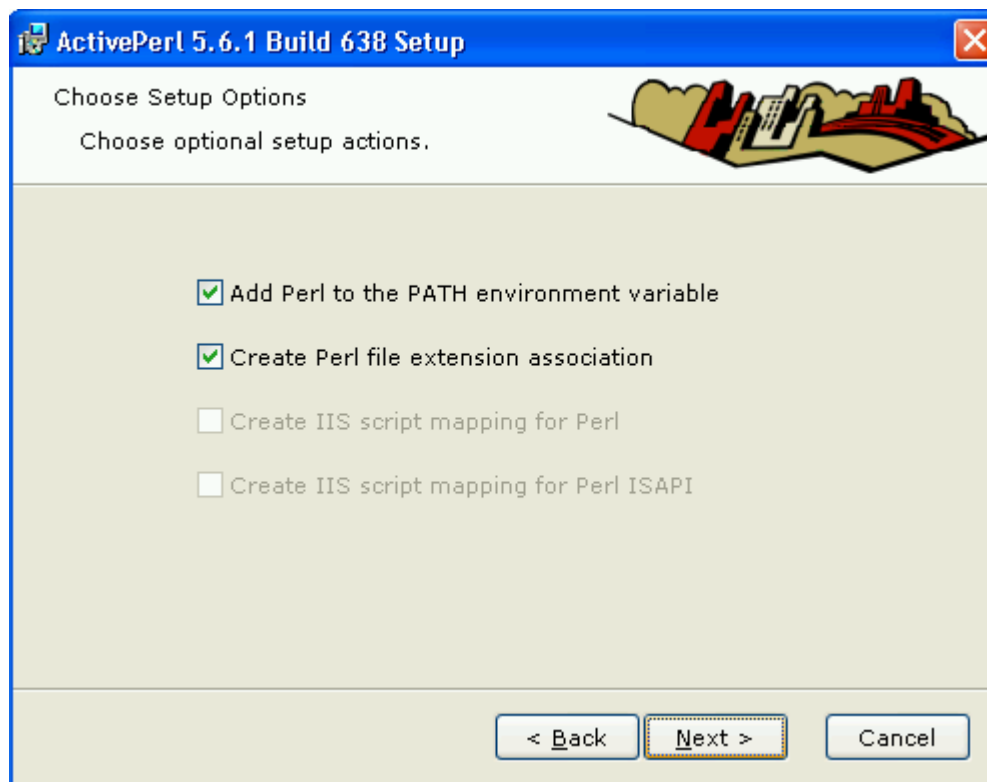
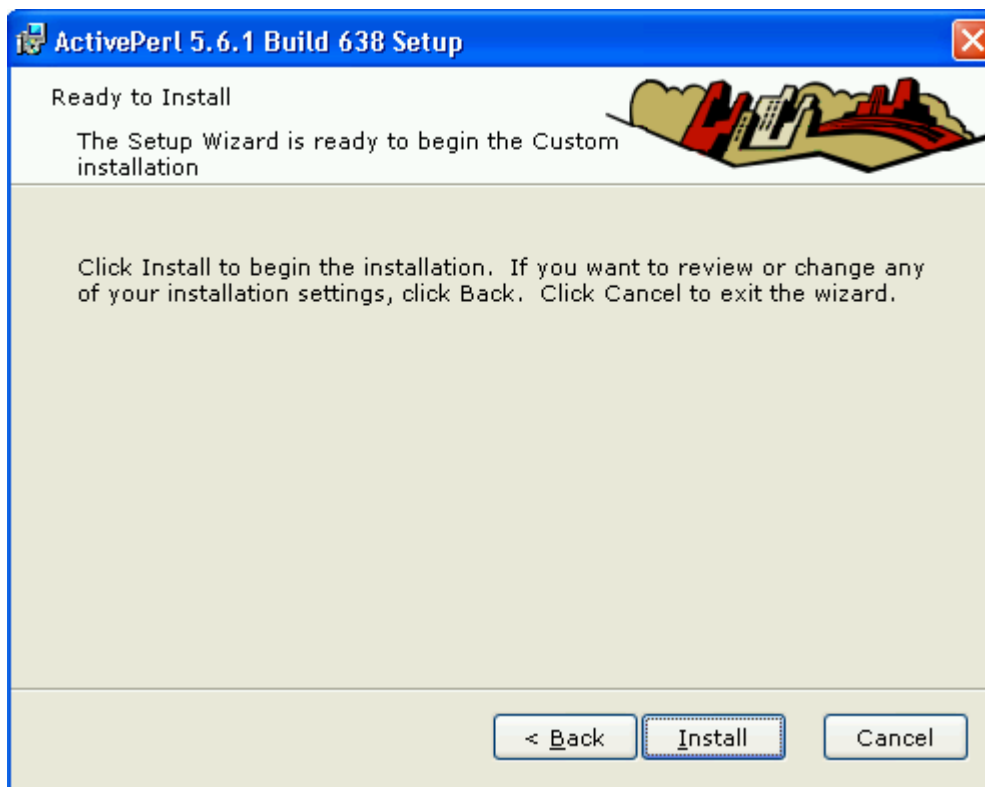


Figure 11-23 Setup Options dialog

- 1 10. Click INSTALL (Figure 11-24). Wait while the Setup Wizard installs ActivePerl. This may
- 2 take several minutes.



3

4 **Figure 11-24 Ready to Install dialog**

1 When installation is complete, click FINISH (Figure 11-25).



2
3 Figure 11-25 Installation complete dialog

11. Verify that Perl TK has been properly installed by typing the following in a DOS window:

```
C:\perl\bin\widget.bat
```

You should see the screen shown in Figure 11-26.

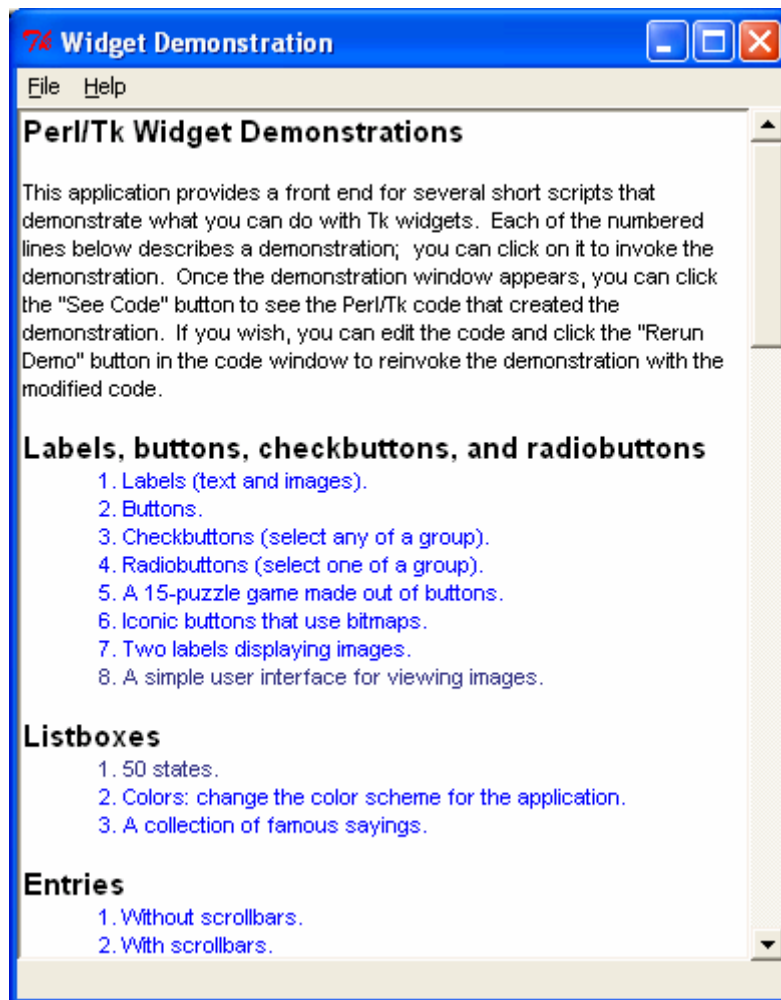


Figure 11-26 Verification screen

If the Widget Demonstration does not appear, install Perl TK by opening a DOS window and typing `ppm install Tk`.