User's Guide

MERCURY™

Mercury Functional Testing for Wireless

User's Guide

Version 8.3

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Mercury Functional Testing for Wireless User's Guide, Version 8.3

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Introduction

This document explains how to use Mercury Functional Testing 8.3 for Wireless to control and test Symbian OS Smartphone or Windows Mobile devices.

Mercury Functional Testing for Wireless supports interactive and manual testing, as well as script execution from QuickTest Professional. It consists of Mercury QuickTest Professional and a Windows application designed to allow a Symbian OS Smartphone or Windows Mobile device to be controlled from a Windows computer. Mercury Functional Testing for Wireless enables you to create powerful automated tests for systematic testing of Smartphone devices and the applications that run on them by automating the Windows application that is controlling the Symbian OS or Windows Mobile device.

Related Documents

If you are a new Mercury Functional Testing for Wireless, the *Mercury Functional Testing 8.3 for Wireless Getting Started* manual provides a quick overview and tutorial to help you understand the basic capabilities of Mercury Functional Testing for Wireless.

The *Mercury Functional Testing 8.3 for Wireless Installation Guide* provides detailed instructions for installing Mercury Functional Testing for Wireless on a computer, and installing agent software on the devices that you want to test. It also specifies the list of supported devices. If you want to test other devices, for example a prototype device, contact your Mercury Functional Testing for Wireless representative to discuss additional support choices that may be available to you.

For test automation you must also install Mercury QuickTest Professional. Refer to Mercury QuickTest documentation for information on installation.

For more information on using test automation with Mercury Functional Testing for Wireless, contact your Mercury Functional Testing for Wireless representative

Using Mercury Functional Testing for Wireless

Mercury Functional Testing for Wireless supports the following activities:

- Controlling devices through the Wireless Dashboard
- Detecting devices
- Dashboard settings
- Starting testing
- Rebooting and shutting down devices
- Disconnecting devices
- Running direct device and system commands
- Checking the event log
- Device testing
- Getting device information
- Controlling device applications
- Launching applications and bringing them to the foreground
- Using the mouse and keyboard to test applications
- Using commands and scripts to test applications
- Capturing test information and results
- Capturing application screenshots
- Using application text recognition
- Accessing the file system on the device

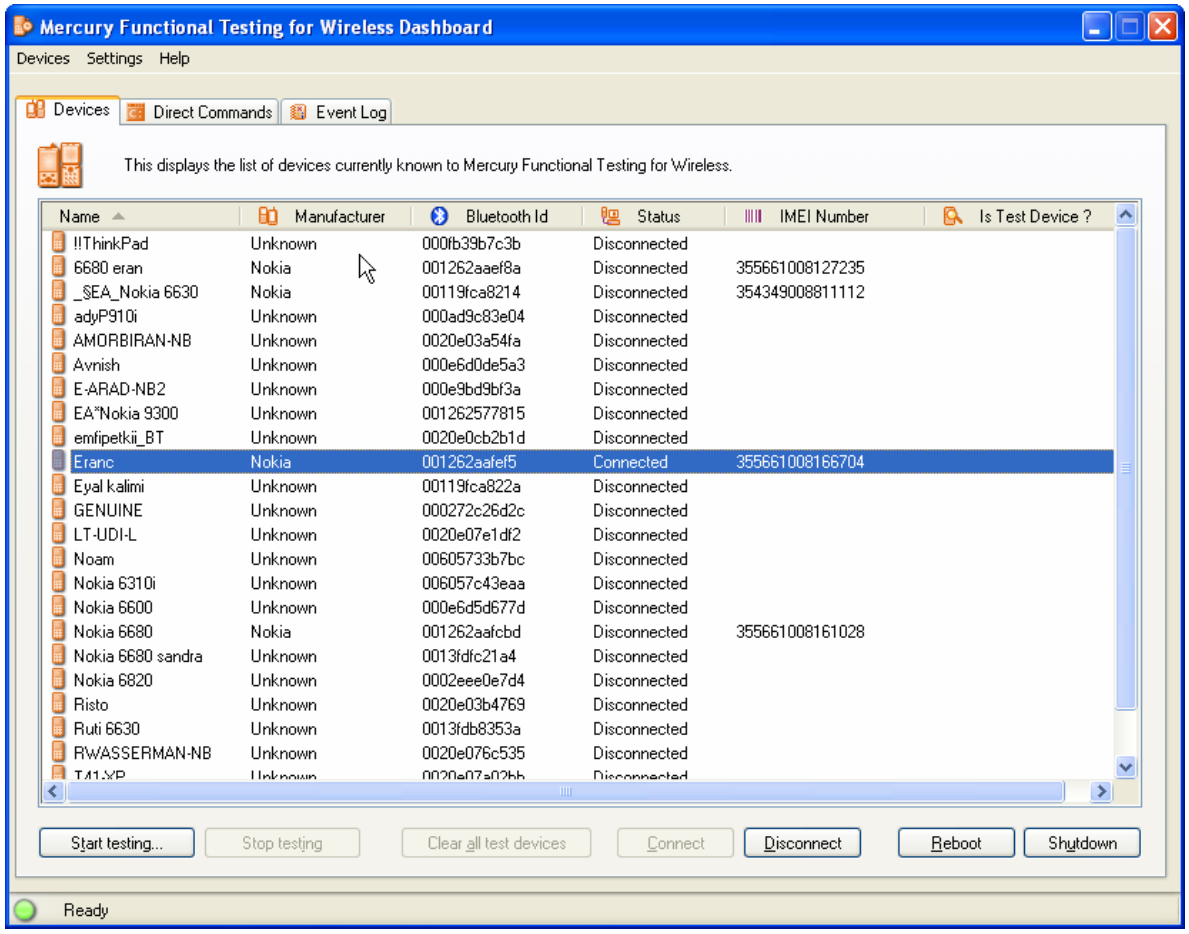
Working with the Wireless Dashboard

Mercury Functional Testing for Wireless provides a set of high-level device control capabilities through a Windows application that presents a dashboard of devices that can be used for:

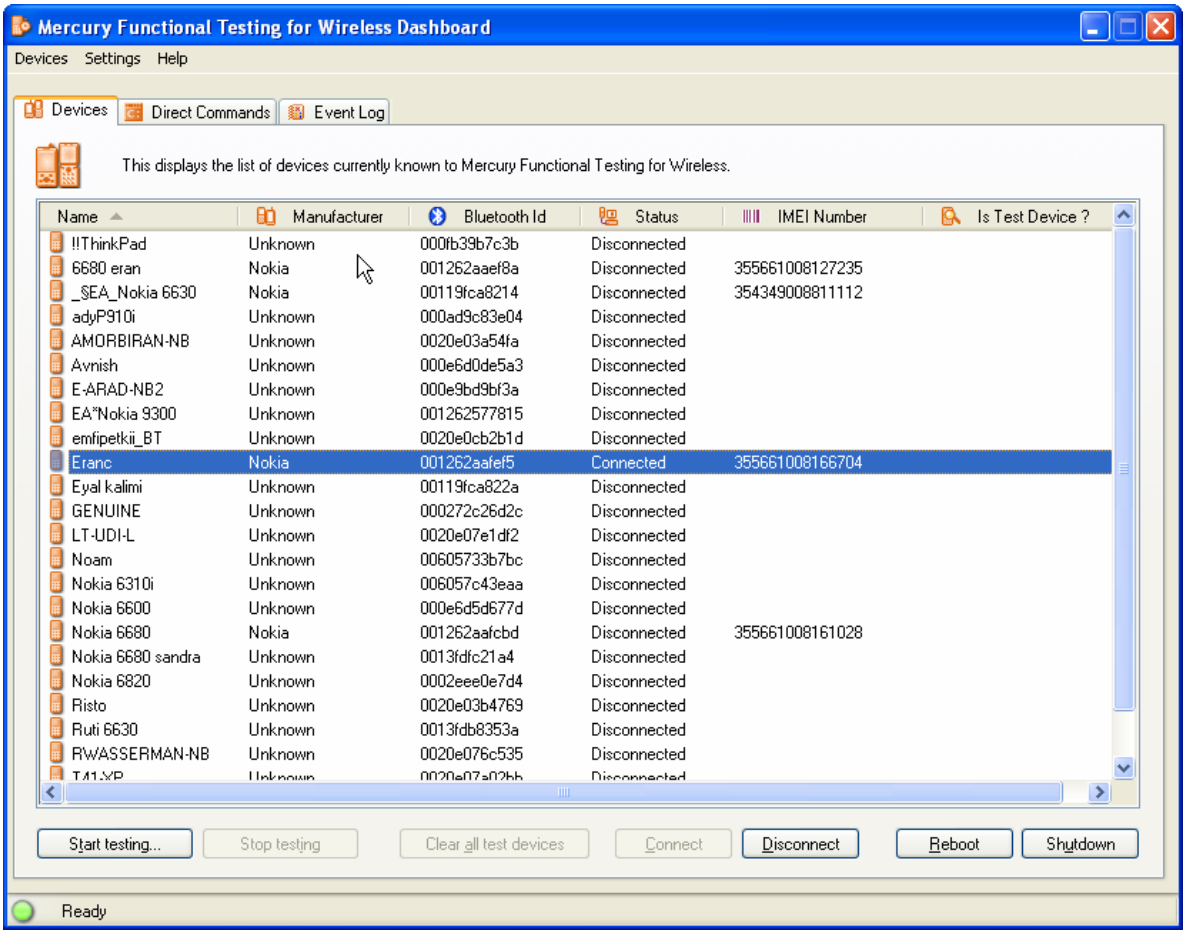
- Detecting devices
- Dashboard settings and preferences for all devices
- Direct commands
- Event logging
- Starting testing

Detecting devices

When you start Mercury Functional Testing for Wireless, it searches for Smartphone devices and displays them in the Known Devices list on the Devices tab.



Tip: Watch the status bar at the bottom of the screen.



During normal operation, Mercury Functional Testing for Wireless updates the Known Devices list if new devices connect using Infrared, USB, or Serial cable. Mercury Functional Testing for Wireless also provides a **Refresh List** option that you can use to update the list at any time.

Go to the **Devices** tab.

Right-click on the Known Devices list.

Select **Refresh List...** from the popup menu.

Note: The **Refresh List** option does not initiate a Bluetooth search. The popup menu provides a separate **Discover Bluetooth Devices** option to initiate a Bluetooth search, because Bluetooth searches can take a comparatively long time.

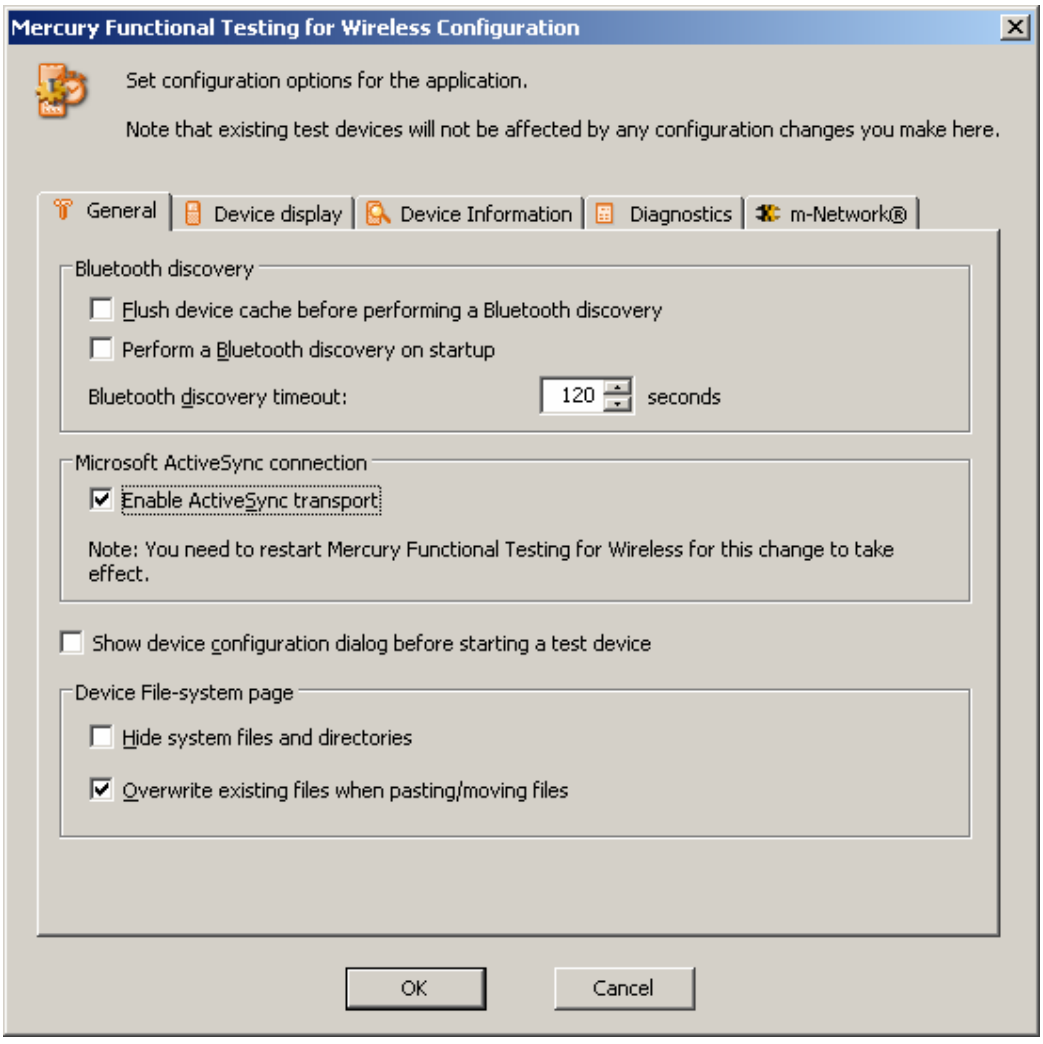
Mercury Functional Testing for Wireless displays all detected devices in the Known Devices list. The known devices are then available for you to control and test, subject to the appropriate preparation.

Dashboard Settings

Mercury Functional Testing for Wireless includes configuration options for device detection and automatic refreshing.

1. Go to the **Dashboard** window.
2. Select **Settings** from the menu.
3. Navigate by Clicking the **General**, **Device display**, **Device Information**, **Diagnostics** and **m-Network®** tabs and selecting the required options.

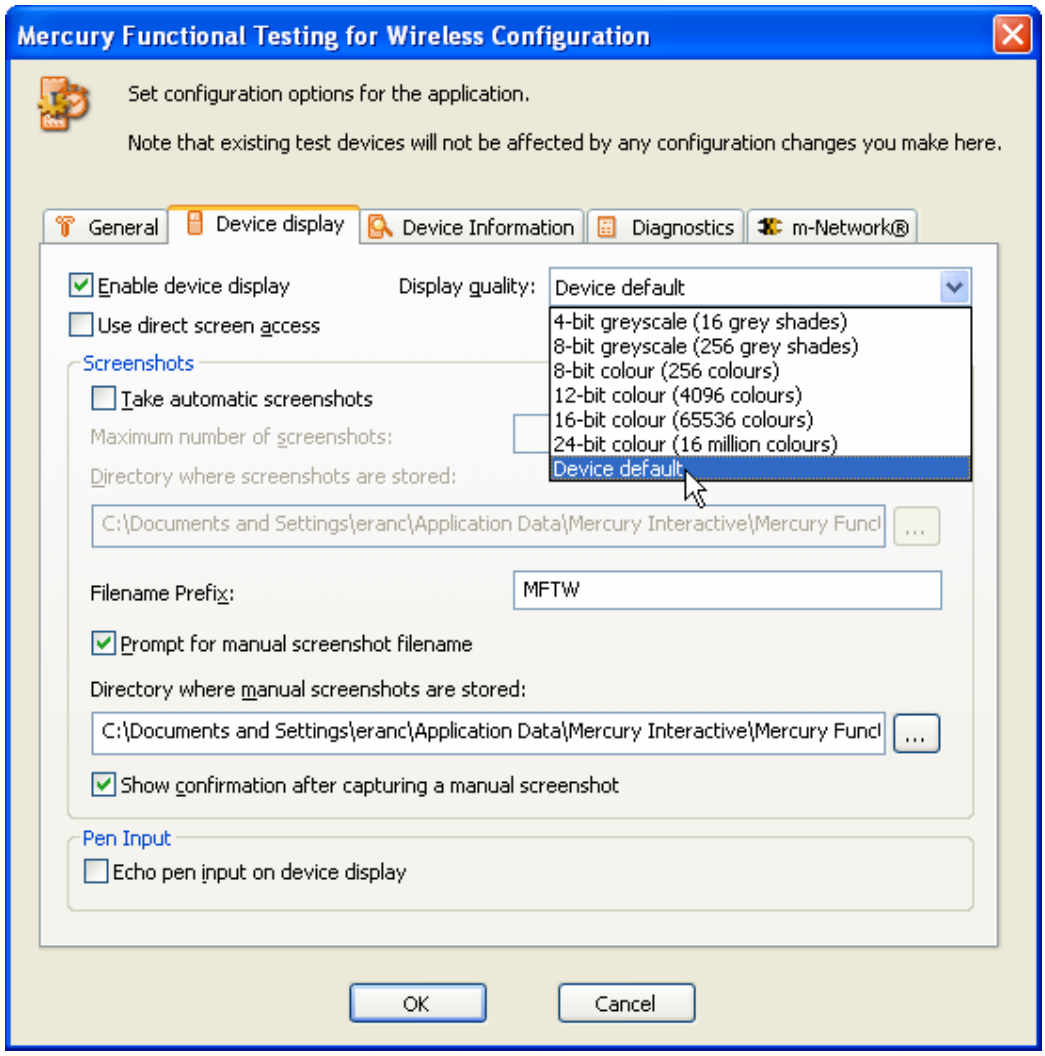
General settings and preferences for all devices



The General tab contains preferences for Mercury Functional Testing for Wireless

Tip: If you wish to accept the devices in the list, deselect **Perform a Bluetooth discovery on startup.** This also results in faster startup.

Device display settings



The Device display tab contains display-related preferences for all devices controlled by Mercury Functional Testing for Wireless.

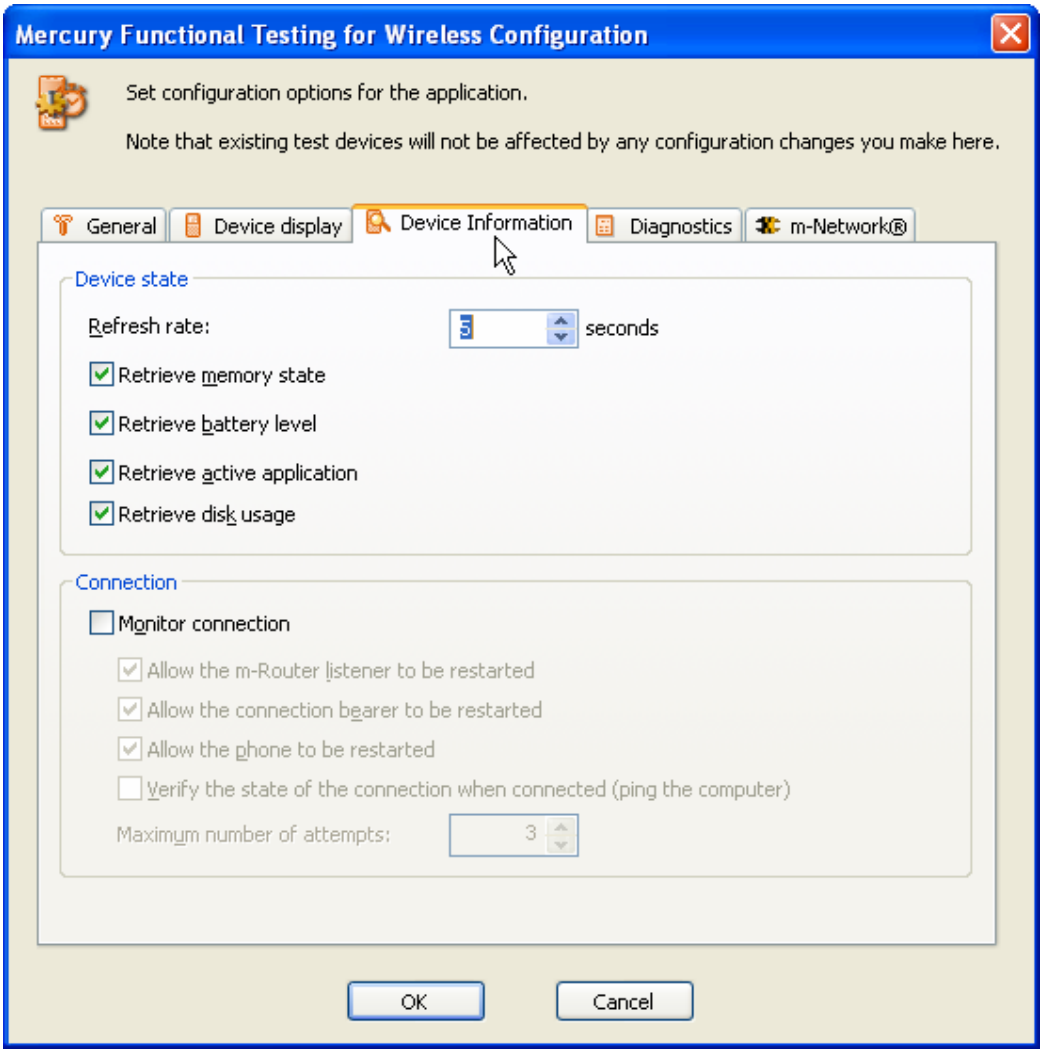
Tip: You can give all screenshot filenames a prefix relevant to the test suite or device for easy analysis.

Device Information settings

Here you can set detailed **Device state** settings that may help your particular device under test.

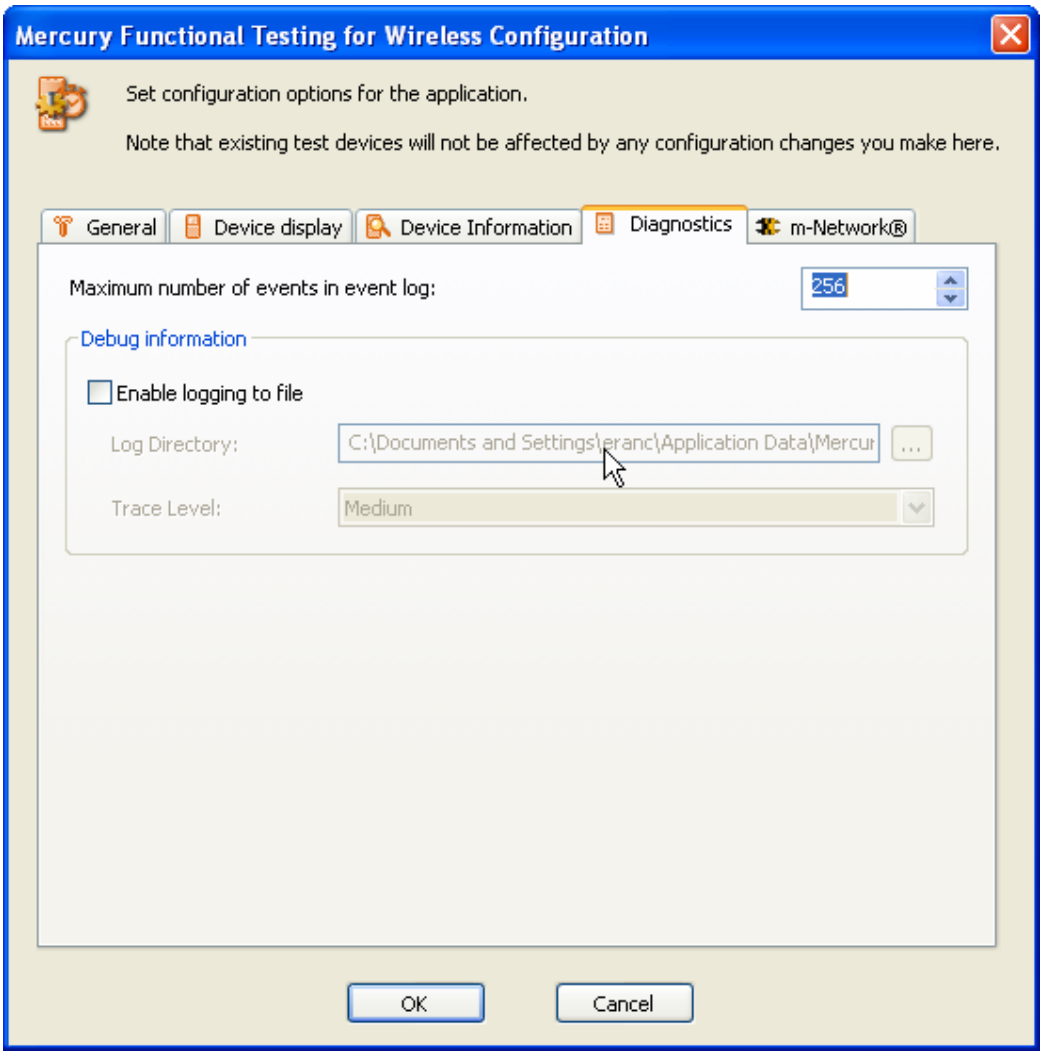
Optionally, you can configure the **Connection** monitor that will allow the listener, connection bearer, and ultimately the device under test itself to be restarted.

Connection to the device under test can be verified using simple IP ping.



Tip: Select this option and test for it in scripts if you want to run unattended tests over a long period.

Diagnostics settings



Logging to a file can provide significantly more detail to track down an issue with a device under test. It is not enabled by default.

Maximum number of events in event log

Use this setting to limit the number of events Mercury Functional Testing for Wireless displays in the **Event log** panel. When Mercury Functional Testing for Wireless reaches the limit, the oldest event is deleted to make way for a new event.

Diagnostics Logging

Use the **Enable logging to file** option to create a Mercury Functional Testing for Wireless diagnostics log file.

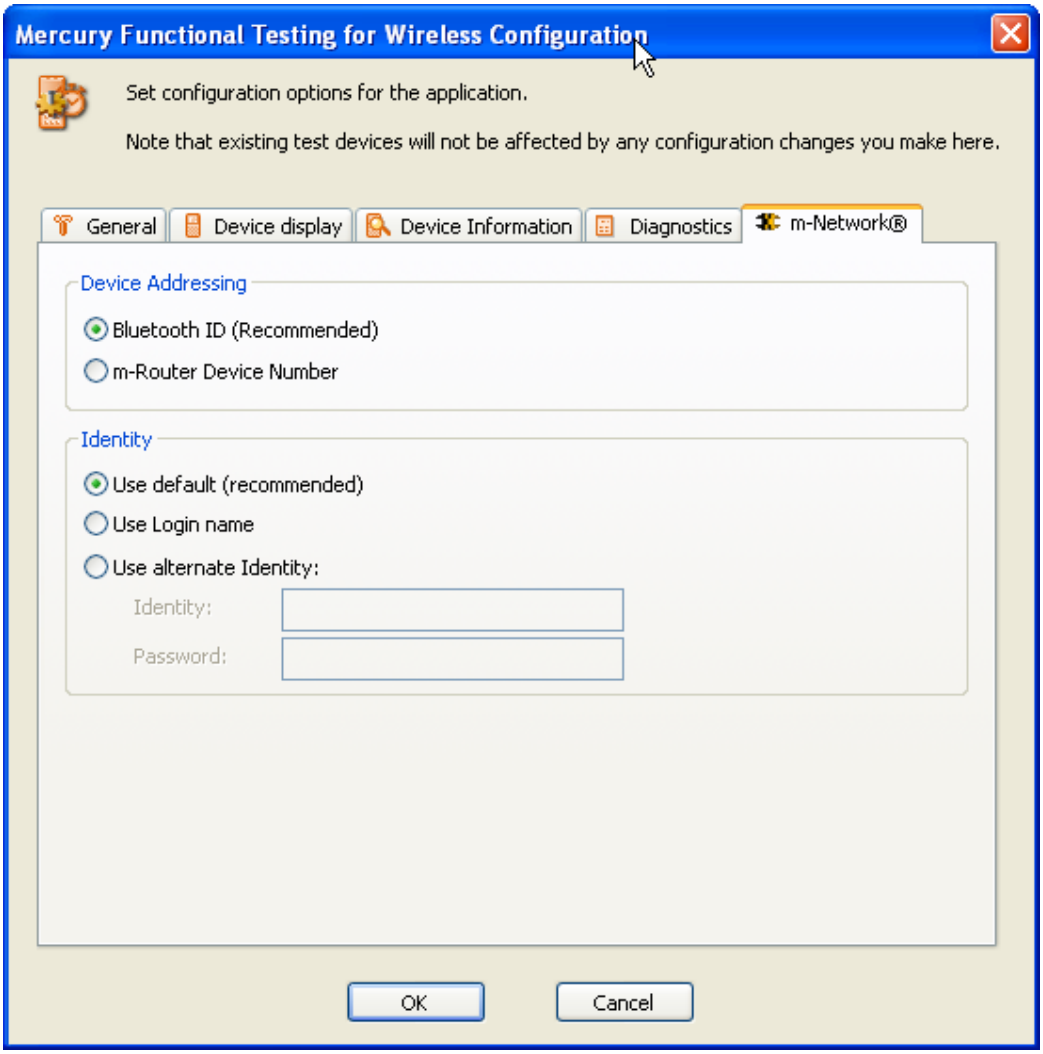
Note: The diagnostics information is not the same as the events that Mercury Functional Testing for Wireless writes to the **Event log** panel. If you want to write events to file, see the section on Exporting events below.

If you enable diagnostics logging, use the **Log Directory** setting to specify where Mercury Functional Testing for Wireless creates diagnostic logs.

If you enable logging to file, use the **File Logging Level** setting to specify which level of diagnostics to log.

Note: Mercury recommends that you only enable diagnostics logging when you have a problem, so that you can send the logs to Mercury for analysis. It is not recommended to have logging enabled all the time.

m-Network settings



Tip: It is best not to change from the recommended settings unless directed by your Mercury Functional Testing for Wireless representative.

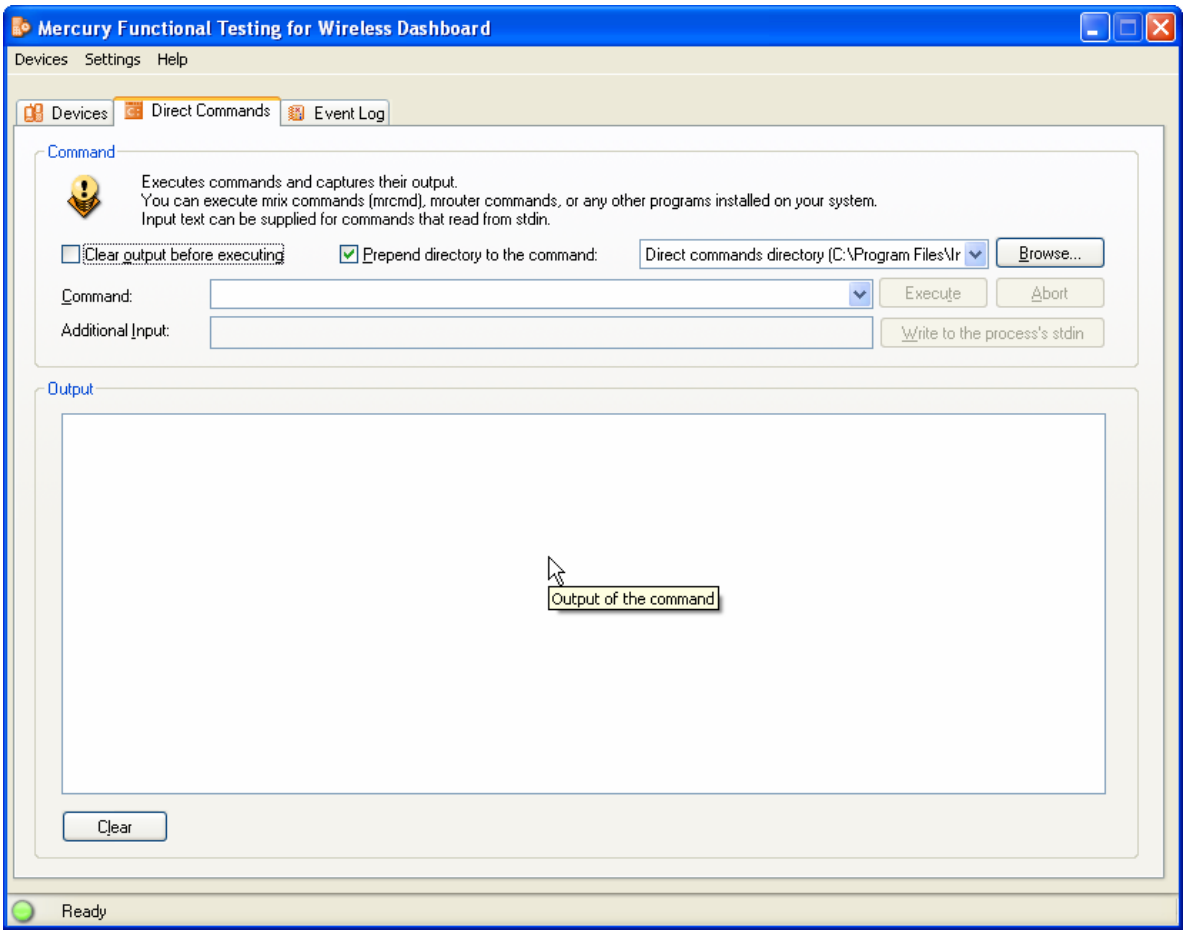
Mercury Functional Testing for Wireless uses m-Network to enable many of the Mercury Functional Testing for Wireless features, such as the ability to display the list of applications on the target device, and the ability to use the Keypad and Display tab to send key clicks to a device application.

This tab enables you to select the type of device identifier Mercury Functional Testing for Wireless uses when using m-Network pipe processors to control and interact with a device. It is recommended to use the default setting, which is Bluetooth IDs. However, if you are testing devices that do not have unique Bluetooth IDs, you can use this tab to make Mercury Functional Testing for Wireless use the identifiers that m-Router assigns when it detects devices.

Bluetooth IDs are normally unique, but prototype devices sometimes have dummy IDs that cannot be used to uniquely identify them in a test environment. In this case, Mercury Functional Testing for Wireless can use the identifiers assigned by m-Router instead.

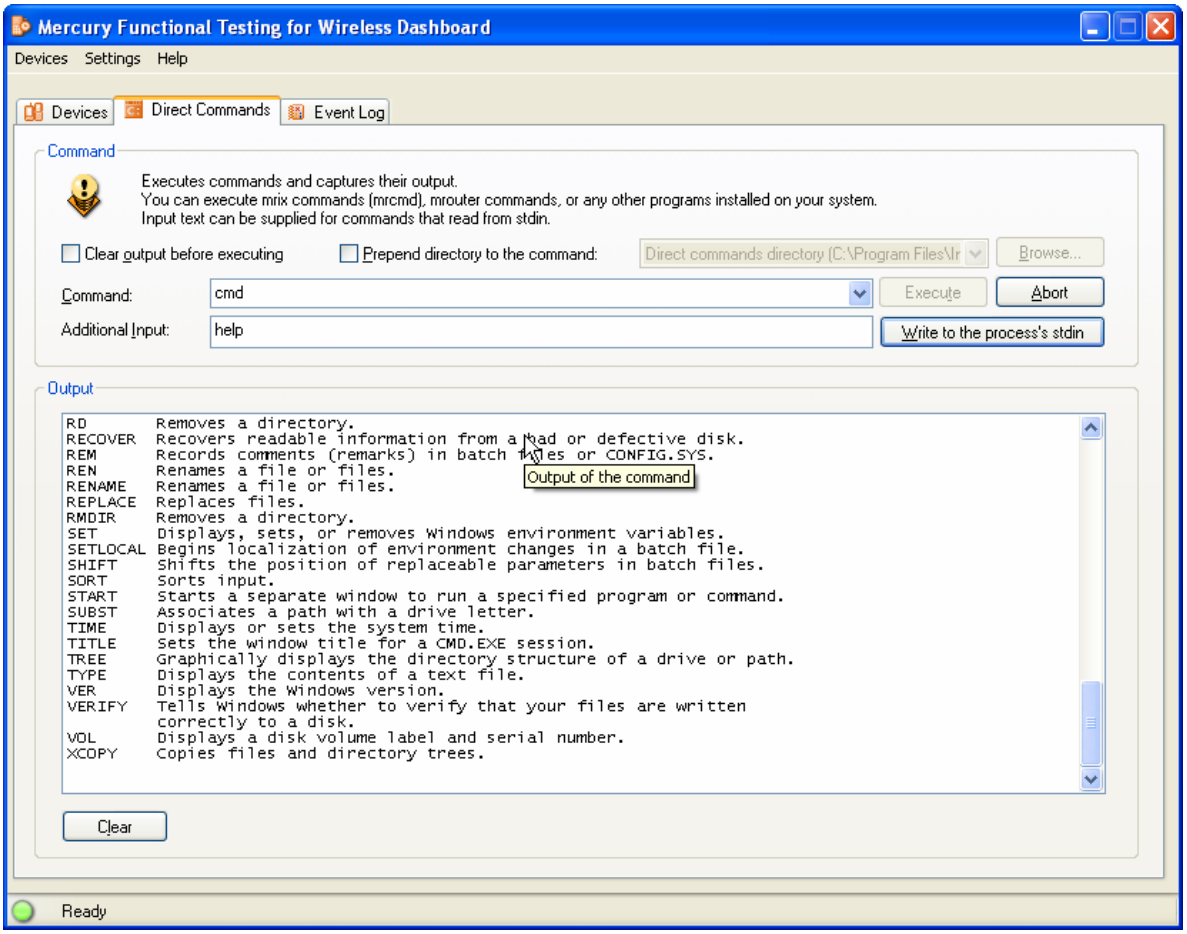
Direct commands to the Mercury Functional Testing for Wireless Dashboard

You can use the Direct Commands tab to send commands to applications and services running on Mercury Functional Testing for Wireless.



The Direct Commands tab on the dashboard provides a convenient place from where you can run an external command and have its output returned in the output window for further processing in scripts that would otherwise have no mechanism to interpret the output.

Tip: You can run MS-DOS® commands, batch files, perl scripts and other commands.



For example, you can use the Windows CMD.exe from within Mercury Functional Testing for Wireless during test procedures, as follows:

1. Go to the **Direct Commands** tab.
2. Make sure the **Prepend directory to the command** option is **not** selected.
3. Type **cmd** into the **Command** field.
4. Click **Execute**.

cmd runs and its output appears in the **Output** area of the **Direct Commands** tab. The **Additional Input** field becomes active, enabling you to enter additional input that will be directed to cmd. For example:

1. Type **help** into the **Additional Input** field.
2. Click **Write to the pipe processor's stdin**.
3. The help command is processed by cmd, and the output appears in the **Output** area.

In this way, you can use cmd to run scripts, move test files around, or test for the presence of files, for example.

Prepend directory to a command

Use the **Prepend directory to the command** option to control whether Mercury Functional Testing for Wireless prepends a directory to the commands that you type into the **Command** field.

By default, Mercury Functional Testing for Wireless offers some folders that are created by the Mercury Functional Testing for Wireless installation. You might keep Mercury Functional Testing for

Wireless scripts in one or more of these folders. You can use the **Browse...** button to select further folders.

For example, you can use the prepend option to specify the path to a test script or executable, as follows:

1. Go to the **Direct Commands** tab.
2. Make sure the **Prepend directory to the command** option is selected.
3. Use the **Browse...** button to select the directory that contains the script or executable you want to run. Mercury Functional Testing for Wireless provides quick links to its own directories, or you can browse to any other directory.
4. Type the name of the script or executable into the **Command** field.
5. Click **Execute**.

If the script or executable can take input, the **Additional Input** field becomes enabled so that you can provide the input.

Tip: If the directory you want to select is in PATH, you can simply disable the Prepend directory to the command option, and Mercury Functional Testing for Wireless will use PATH instead.

Additional input to commands

You can use the **Command** field to invoke a command that can run indefinitely and require additional input. For example, you can run a test script that prompts you to specify test parameters. Whenever the active command requires input, Mercury Functional Testing for Wireless activates the **Additional Input** field. Type the necessary input and click **Write to the pipe processor's stdin**.

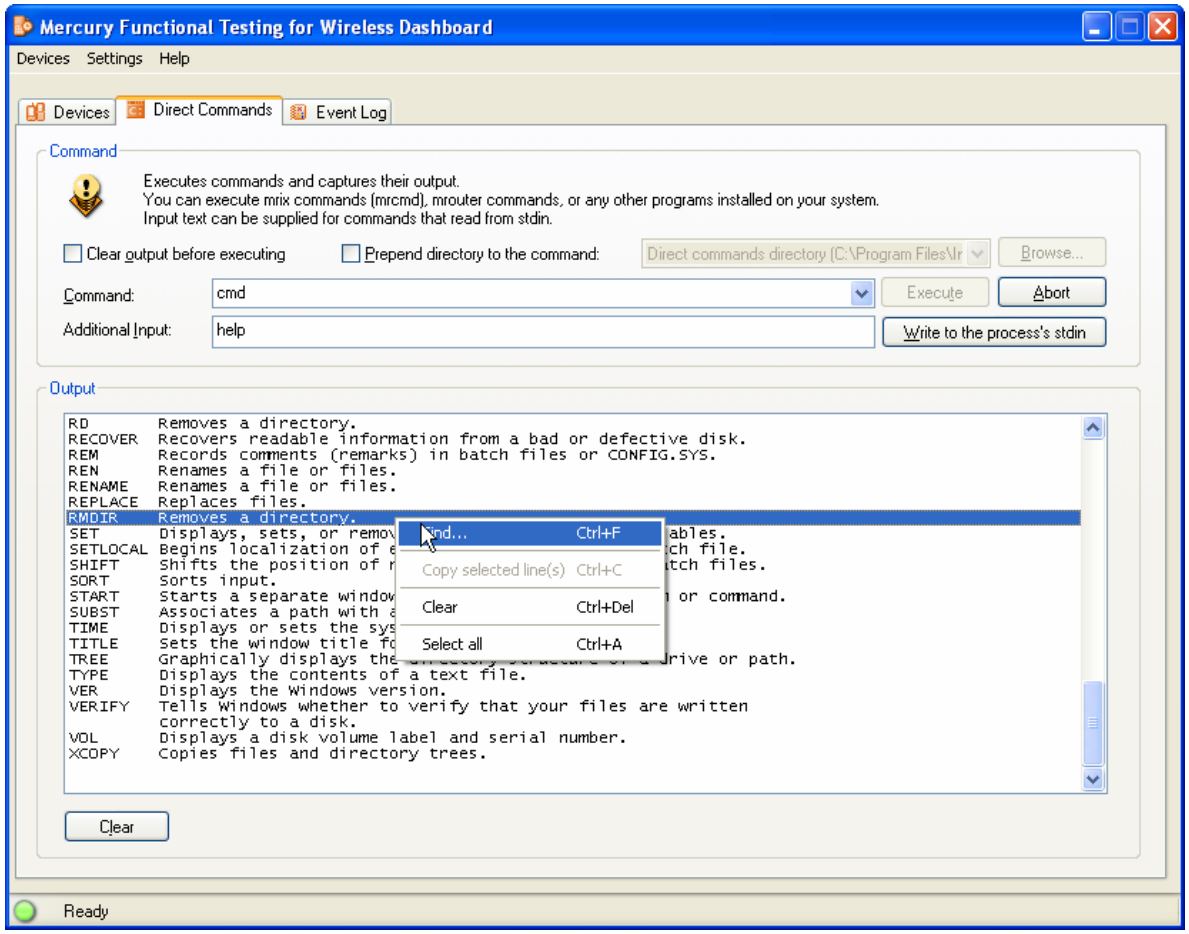
Copying command output

All output from direct commands is written to the **Output** panel of the **Direct Commands** tab. This can include output from test scripts, for example, so it can be useful to capture some of the output for future reference.

You can select and copy information from the **Output** panel, as follows:

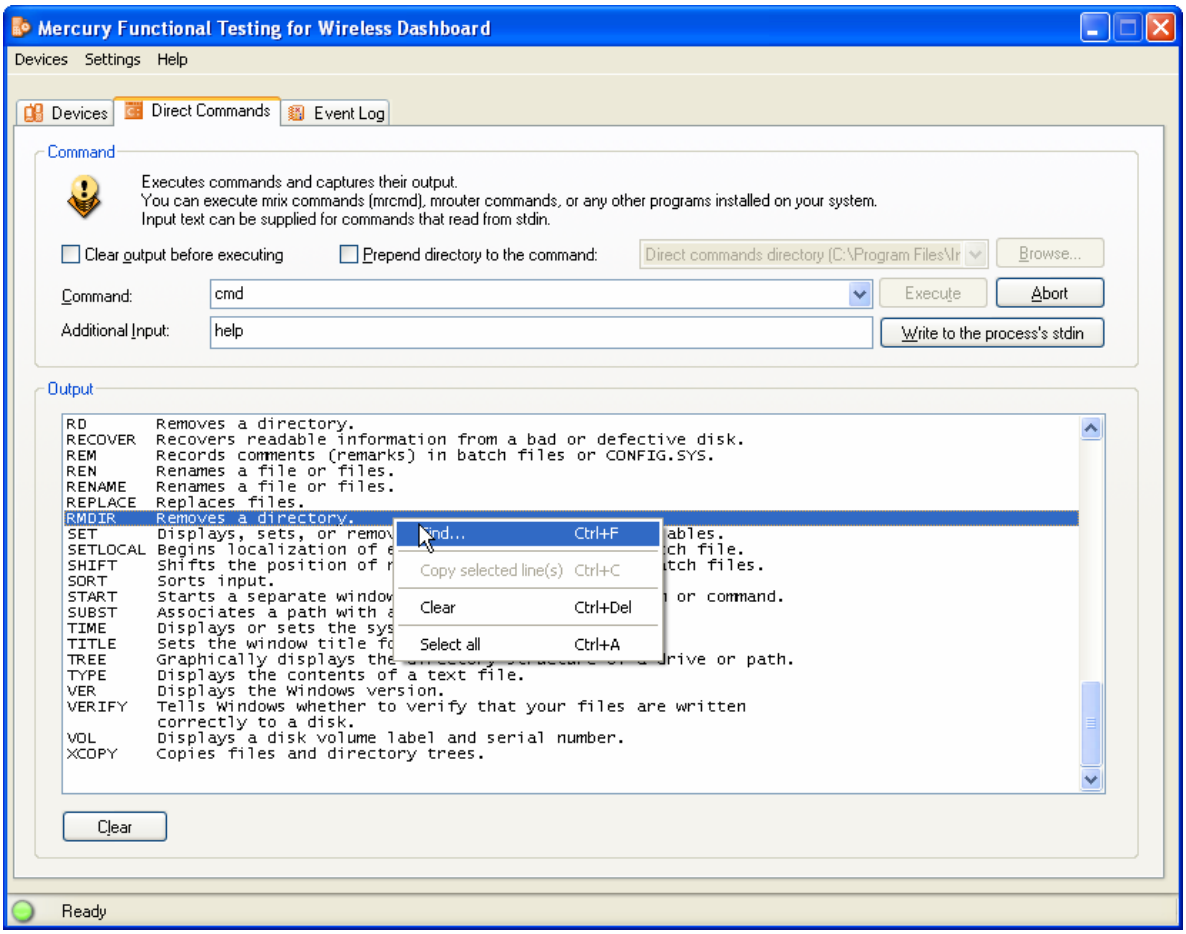
1. Use your mouse to select one or more lines of text in the **Output** panel.
2. Right-click on the **Output** panel and select **Copy selected line(s)** from the popup menu.

You can then paste the selected lines to another application, such as a text editor.



Tip: The popup menu contains a **Select All** option to simplify selecting all output, if required.

Event Log



Detailed information and errors generated by the component technologies used by Mercury Functional Testing for Wireless are displayed here where your scripts can address them.

Connecting to a device

To test a device, you first need to connect Mercury Functional Testing for Wireless to it.

For Bluetooth devices, connection is not automatic. A Bluetooth device can appear in the **Known Devices** list as Disconnected, and you can create a connection, as follows:

1. Go to the **Devices** tab.
2. Right-click on a disconnected Bluetooth device in the **Known Devices** list.
3. Select **Connect *device* using Bluetooth** from the popup menu, or click the **Connect** button.

Mercury Functional Testing for Wireless attempts to connect to the selected device. The device might accept the connection automatically, or prompt its user to authorize the connection.

Note: The Connect function works for the recommended Bluetooth implementation, but might not work for other implementations. If a connection fails, use the Bluetooth user interface provided with your Windows computer and your phone to make a connection, and then use the Mercury Functional Testing for Wireless refresh function to refresh the **Known Devices** list.

When connected, Mercury Functional Testing for Wireless updates the Known Devices list to show a device Status of Connected. The next step is **Start testing** a connected device.

Devices using other types of connectivity are listed as Connected as soon as you make the physical cable connection, or the device moves into line-of-sight of the Infrared sensor.

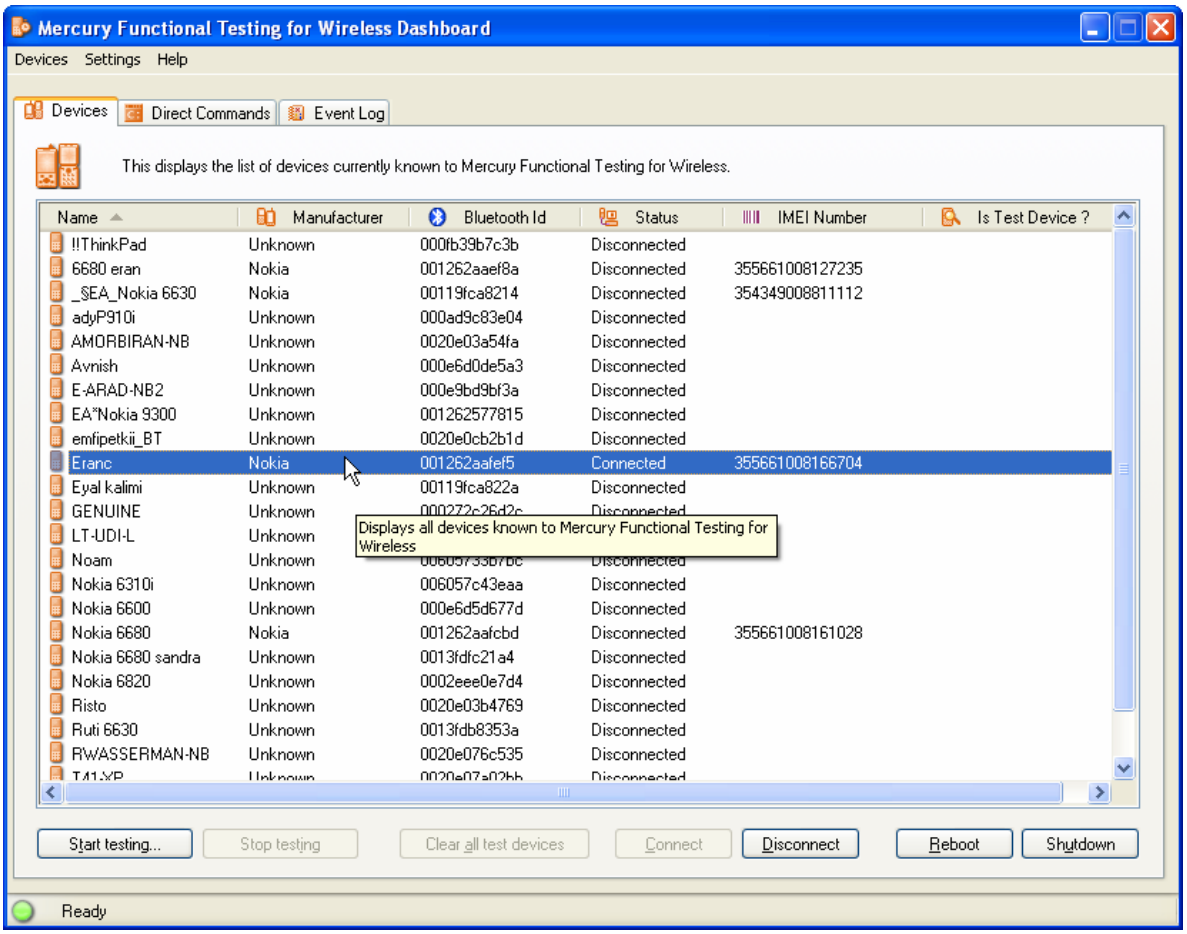
Tip: Mercury Functional Testing for Wireless can detect devices that it may not be able to connect to, and generate error events when you attempt to connect. You need to prepare devices to receive Mercury Functional Testing for Wireless connections.

Tip: If the device you want to connect to is not in the Known Devices list, ensure that it is turned on, is reachable using your chosen connectivity type (for example, that Bluetooth is enabled on the device, or a USB device is plugged in to Mercury Functional Testing for Wireless), and then right-click on the Known Devices list and select **Refresh List...** or **Discover Bluetooth Devices** from the popup menu.

Start testing

Before you can **Start testing** a connected device, you must set it as a test device.

1. Go to the **Devices** tab.
2. Select a connected device in the **Known Devices** list.
3. Click the **Start testing** button.



When complete, Mercury Functional Testing for Wireless sets the status of **Is Test Device?** to **Yes** and launches a **Device** window with a Window caption starting with the Bluetooth name of the device under test.

Rebooting and shutting down a device

Mercury Functional Testing for Wireless can reboot and shut down devices to which it is connected.

For example, you can use these options during testing to return a device to a known state for further testing, or to recover from a serious device application failure.

To reboot or shut down a device:

1. Select a connected device from the **Known Devices** list.
2. Click **Reboot** or **Shutdown**, as required.

Mercury Functional Testing for Wireless reboots or shuts down the selected device.

You can reboot or shut down a connected device regardless of whether you have set the device as the target device for testing.

Tip: Mercury Functional Testing for Wireless does not automatically reconnect to a rebooted device.

Disconnecting a device

When you have finished testing a particular device, you can disconnect it from Mercury Functional Testing for Wireless.

Tip: For non-Bluetooth connections, it is advisable to disconnect by physically disconnecting the relevant cable or moving the Infrared device out of the line-of-sight.

For Bluetooth connections, use the **Disconnect** button, as follows:

1. Go to the **Devices** tab in the Dashboard.
2. Select a connected device in the **Known Devices** list.
3. Click the **Disconnect** button.

Mercury Functional Testing for Wireless disconnects the device, and its status in the Known Devices list changes to Disconnected.

Controlling devices and their applications

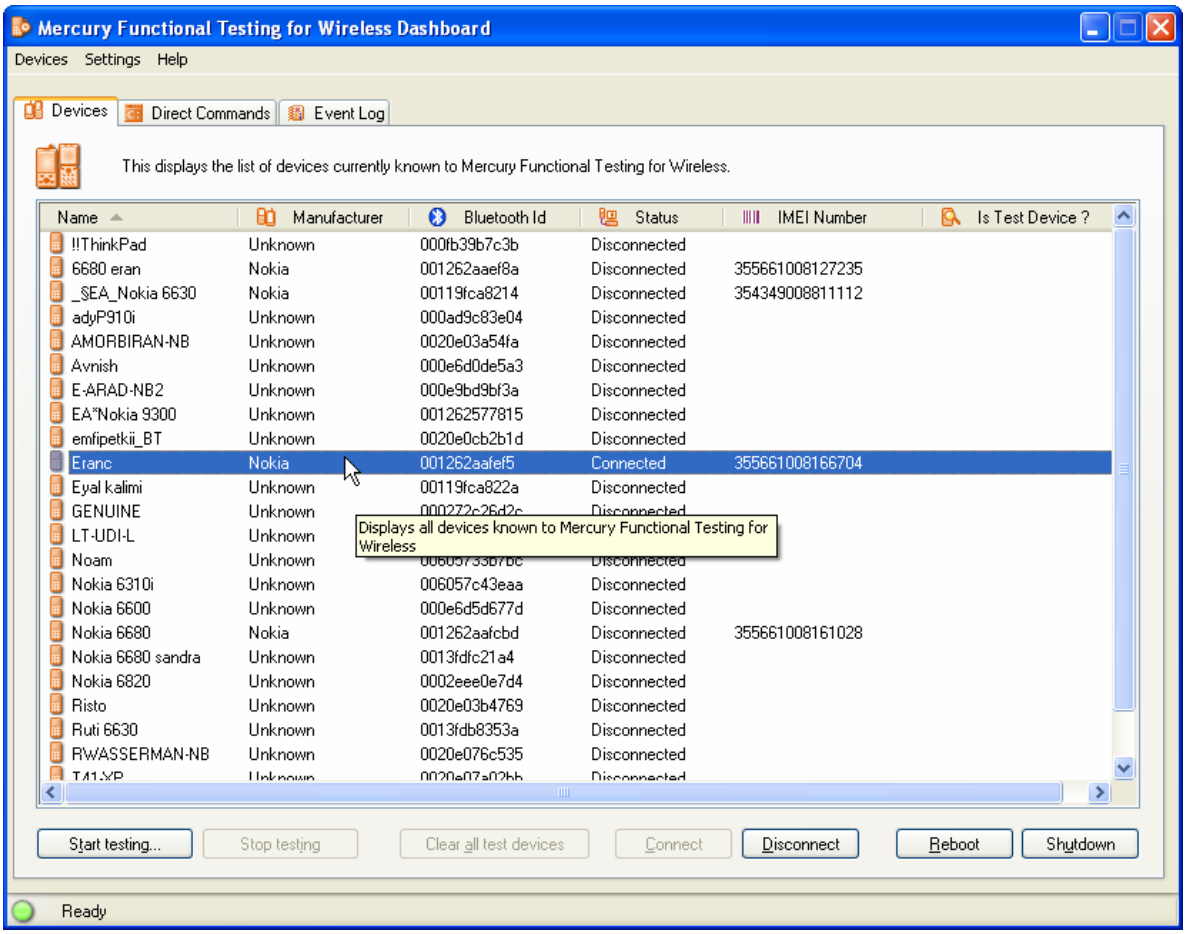
Mercury Functional Testing for Wireless provides powerful options for controlling and testing applications through the device-specific window for each device under test.

For each device you can:

- Launch applications.
- Bring applications to the foreground so that you can interact with them.
- Use your mouse to simulate clicking device buttons.
- Use your keyboard to type text into the application.
- Use your mouse to simulate pen input to an application, if the device supports pen input.
- Use direct commands and scripts to run sophisticated, repeatable tests.

Mercury Functional Testing for Wireless also provides a range of options for capturing and processing test results and application output that can be easily acted upon in an automation script.

Device window



Mercury Functional Testing for Wireless displays a new window for each device under test.

Tip: The Window caption begins with the name of the target device that is easy to identify in a test automation script.

There is no software limit to the number of device windows that can be displayed. Hardware or line-of-sight limits are the only limitation.

The name of the target device is shown in the status bar at the bottom of the Mercury Functional Testing for Wireless screen. The status bar also shows the connection status and some information about the memory resources of the target device. Detailed information is available on the Device Information tab.

You can now control and test applications on the target device.

Launching applications

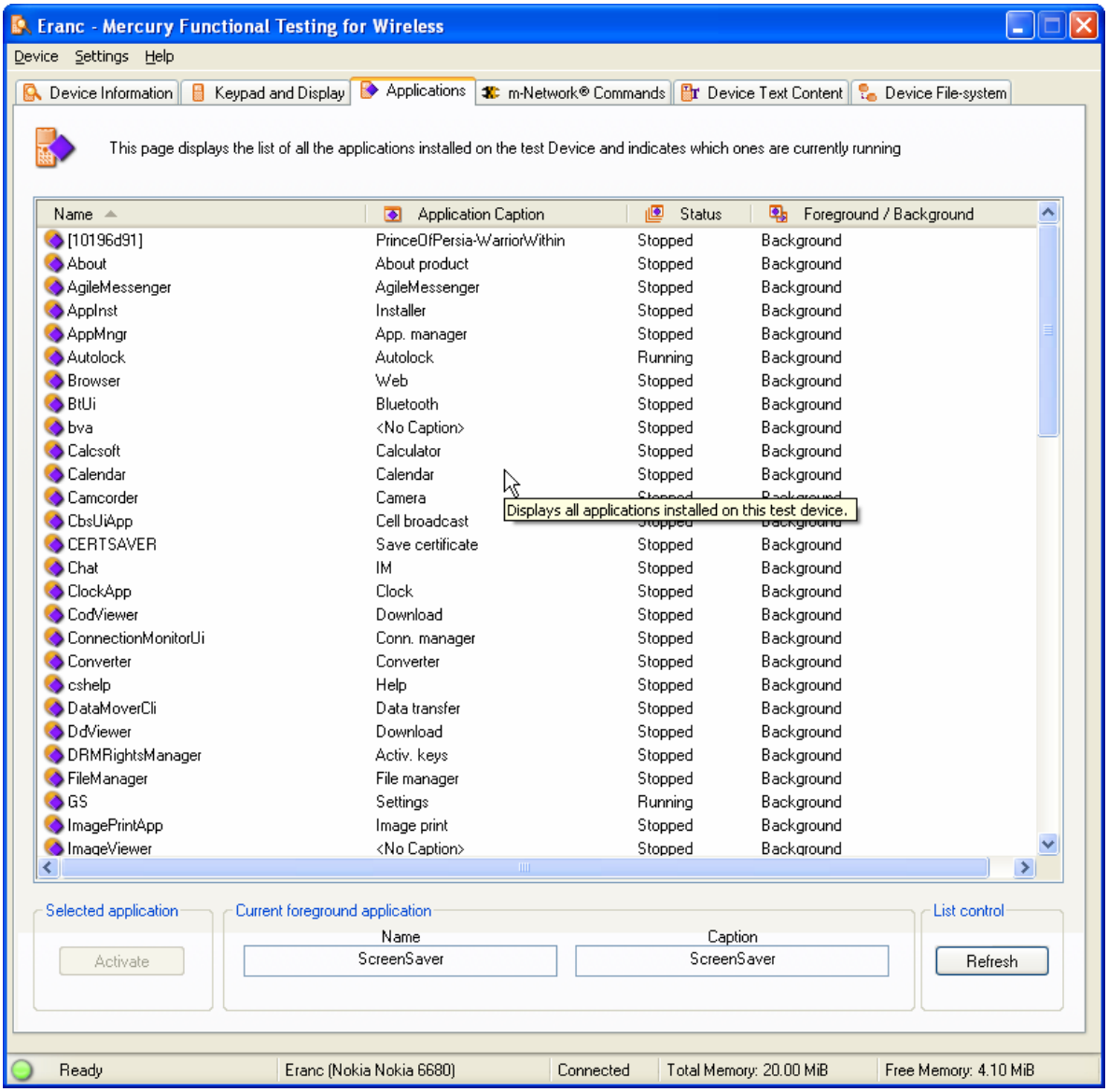
Mercury Functional Testing for Wireless displays a list of the applications present on the target device. The list is in the **Applications** tab of the **Device** window. It can take Mercury Functional Testing for Wireless several seconds to display the list.

The list shows the name of the application, its caption, its current status (Running or Stopped), and whether it is in the foreground or background.

You can start an application that is currently stopped, or bring an application in the background to the foreground as follows:

1. Go to the **Applications** tab.

2. Select the application in the **Applications** list.
3. Click the **Activate** button.



Tip: The list refreshes periodically. In scripts, click the **Refresh** button before relying on the contents of the application list.

Mercury Functional Testing for Wireless sends a command to the device to launch the application. If successful, the application's status is updated to Running.

The list also shows whether the application is running in the foreground or background. If it is running in the foreground, you can go to the Keypad and Display tab and see the application on Mercury Functional Testing for Wireless's representation of the device display.

If an application is running in the background, you can bring it to the foreground so that you can test it interactively with your mouse and keypad, and capture screen information and textual content. Alternatively, you can use commands and scripts to test it while it is running in the background.

Tip: In many cases, you can also launch an application by using the Mercury Functional Testing for Wireless display representation on the Keypad and Display tab, enabling you to simulate the way a user would launch an application, where appropriate.

Bringing an application to the foreground

Device applications can run in the foreground or background. An application in the foreground is one that displays its output on the device display, enabling a user to interact with it.

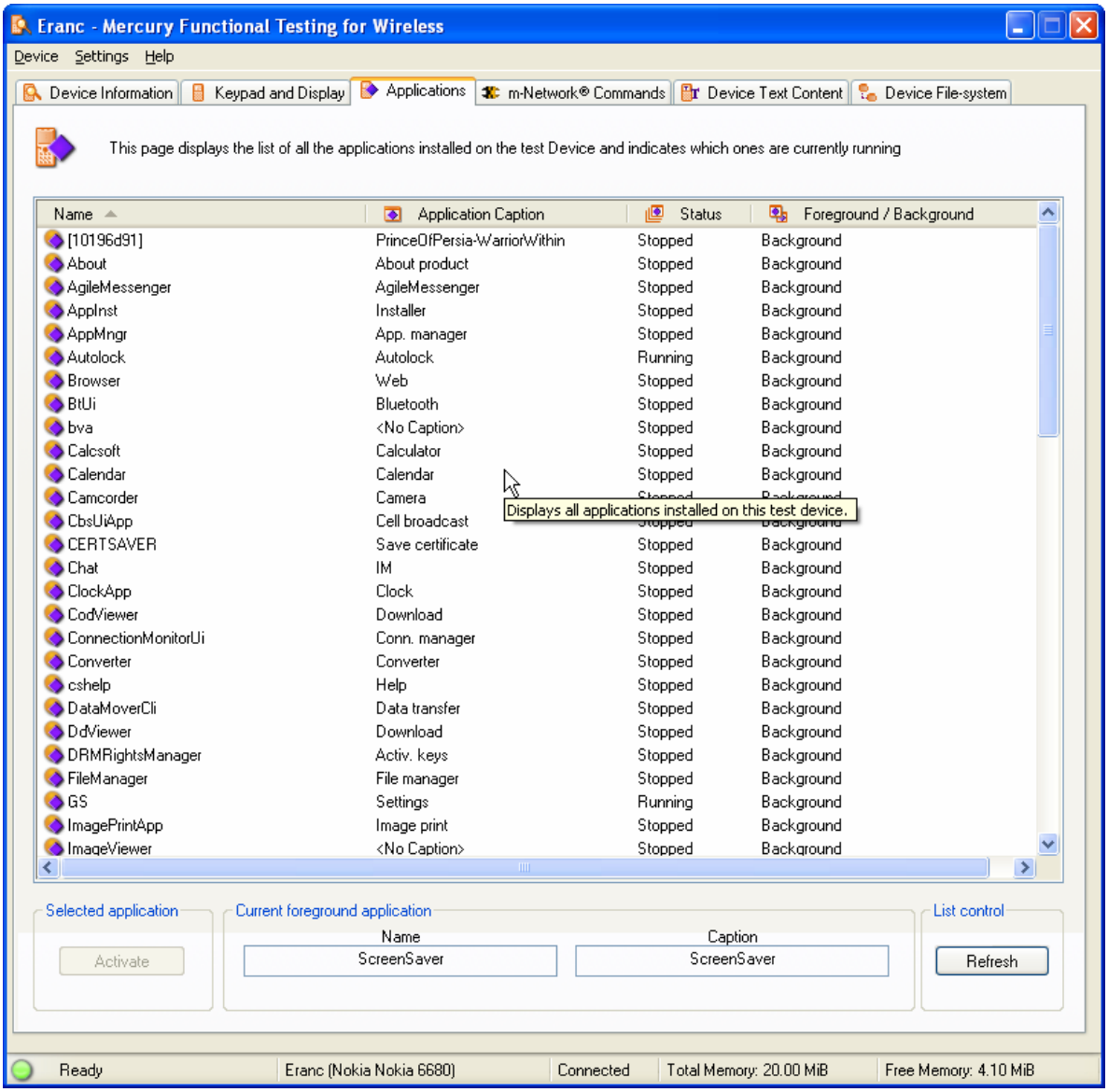
During testing, you might want to bring an application to the foreground so that you can interact with it using your mouse and keyboard, and capture screen displays and textual content for analysis.

Bring a running application to the foreground:

1. Go to the **Applications** tab.
2. Select the application from the **Applications** list.
3. Click the **Activate** button. Even if the application is stopped, it will start running and then come to the foreground.

Mercury Functional Testing for Wireless sends a command to the device to bring the application to the foreground.

The application that was previously running in the foreground moves to the background.



Tip: In many cases, you can also bring an application to the foreground by using the Mercury Functional Testing for Wireless display representation on the Keypad and Display tab, enabling you to simulate the way a user would bring an application to the foreground, where appropriate.

Using the mouse and keyboard to test applications

One of Mercury Functional Testing for Wireless's powerful test options is the ability to simulate user interaction with an application. Mercury Functional Testing for Wireless provides a graphic representation of the target device on the Keypad and Display tab, and you can use your mouse and keyboard to activate device buttons and input text.

For example, you can make a phone call, add a contact to the contacts application, book a meeting in the calendar application, or use an application that you are developing.

You can:

- See a representation of the device display.
- Use your mouse to activate device keys.
- Use your mouse as a pen to write on the device display, if appropriate.
- Use your keyboard to send text input.

If you are testing a new application, these options enable you to simulate normal usage. Using Mercury Functional Testing for Wireless with Mercury QuickTest Professional, you can record and automate such tests.

Using the device display

When you are connected to a target device, the Keypad and Display tab provides a graphic representation of the target device's display screen.

For example, the following shows the representation of a Nokia 6630, with its unique keypad.

Note: There was no need to make a ‘skin’ to represent the device since the primary requirement here is for ease of automated testing, not emulation.

As the device's screen content changes, Mercury Functional Testing for Wireless updates its representation accordingly. The update rate varies according to the speed of the network connection between the device and Mercury Functional Testing for Wireless.

During testing, you can use the device display to see whether an application behaves as expected. You can also take manual and automatic screenshots for comparison purposes.

For devices that support pen input, you can use your mouse to simulate pen input directly onto the Mercury Functional Testing for Wireless representation of the device display.

Using the mouse to activate device keys

You can use your mouse to activate the keys on the target device. Simply click on a key on the **Keypad and Display** tab to activate the corresponding key on the device. For example, click a sequence of keys to dial a phone number.

A feature common to all devices is the significance of key-click duration, or the rapidity of repeated clicks. For example, when entering a name:

- Pressing 2 three times in quick succession enters "c".

- Pressing 2 three times with a one-second pause after each press enters "aaa".
- Holding 2 for one second enters "2".

Mercury Functional Testing for Wireless supports a comprehensive set of key-click options. For interactive use, you can use your mouse clicks exactly as you would use the device keys themselves, clicking rapidly or slowly, or holding a key for a period of time.

To facilitate recording of tests, Mercury Functional Testing for Wireless also provides key-click options on a popup menu that you can access by right-clicking on a key.

The options are:

- **Click, then wait 1 second**
- **Hold for 1 second, then release**
- **Hold** (hold indefinitely)
- **Release** (release a key that is being held indefinitely)
- **Repeat click**
- **Repeat click, then wait 1 second**

The two Repeat options display a Repeat clicks dialog box that you use to specify how many clicks you want to make.

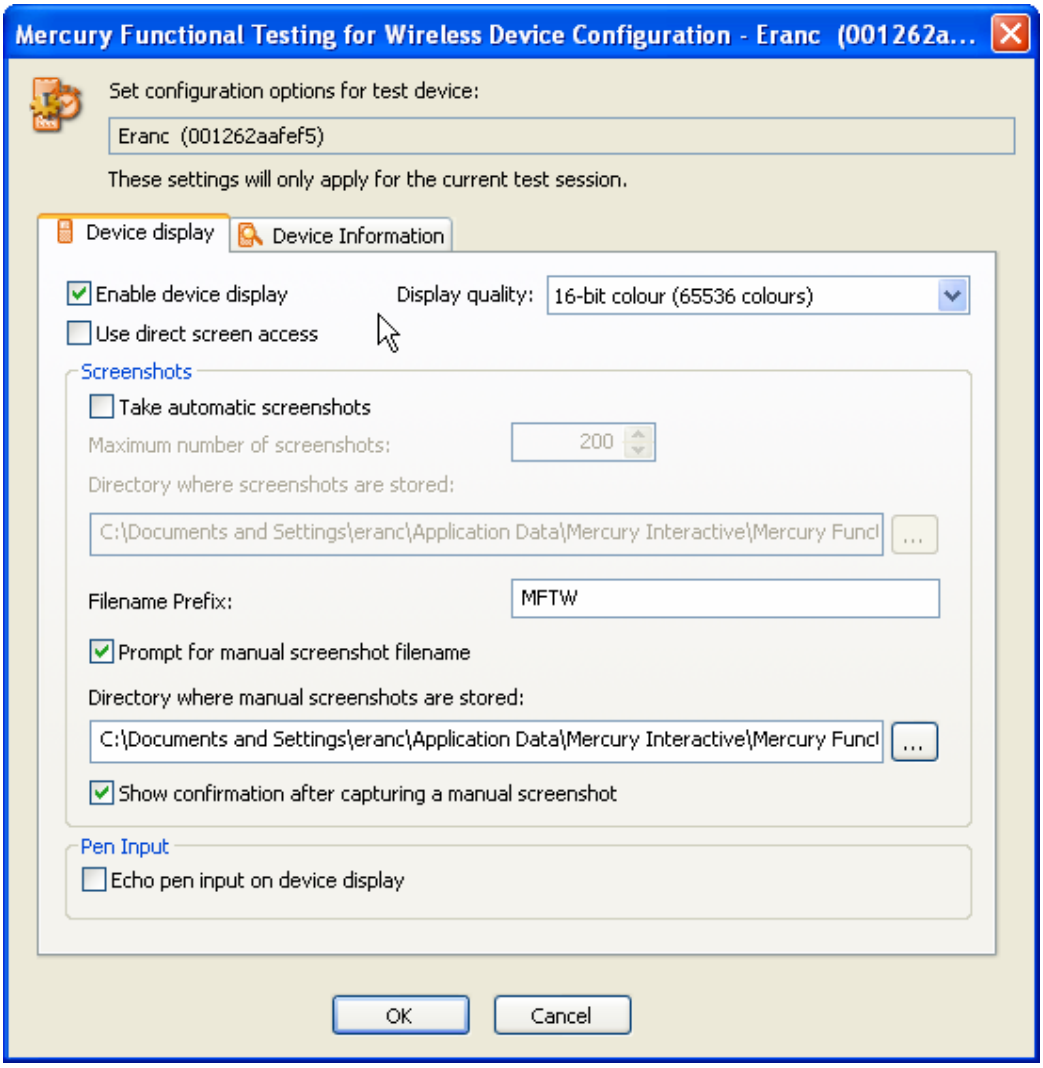
Tip: Mercury Functional Testing for Wireless also provides a text field that you can use to input text more easily, if exercising the device keys is not the main purpose of your test.

Pen input

If the device and application that you are testing support pen input, you can simulate pen strokes by clicking and dragging the mouse button on Mercury Functional Testing for Wireless's representation of the display.

You can control whether each individual device under test updates its representation of the display to show your pen strokes, as follows:

1. Select the device's **Settings** > **Configuration** menu option.
2. Go to the **Device Display** tab.
3. Use the **Echo pen input on device display** option, as required.

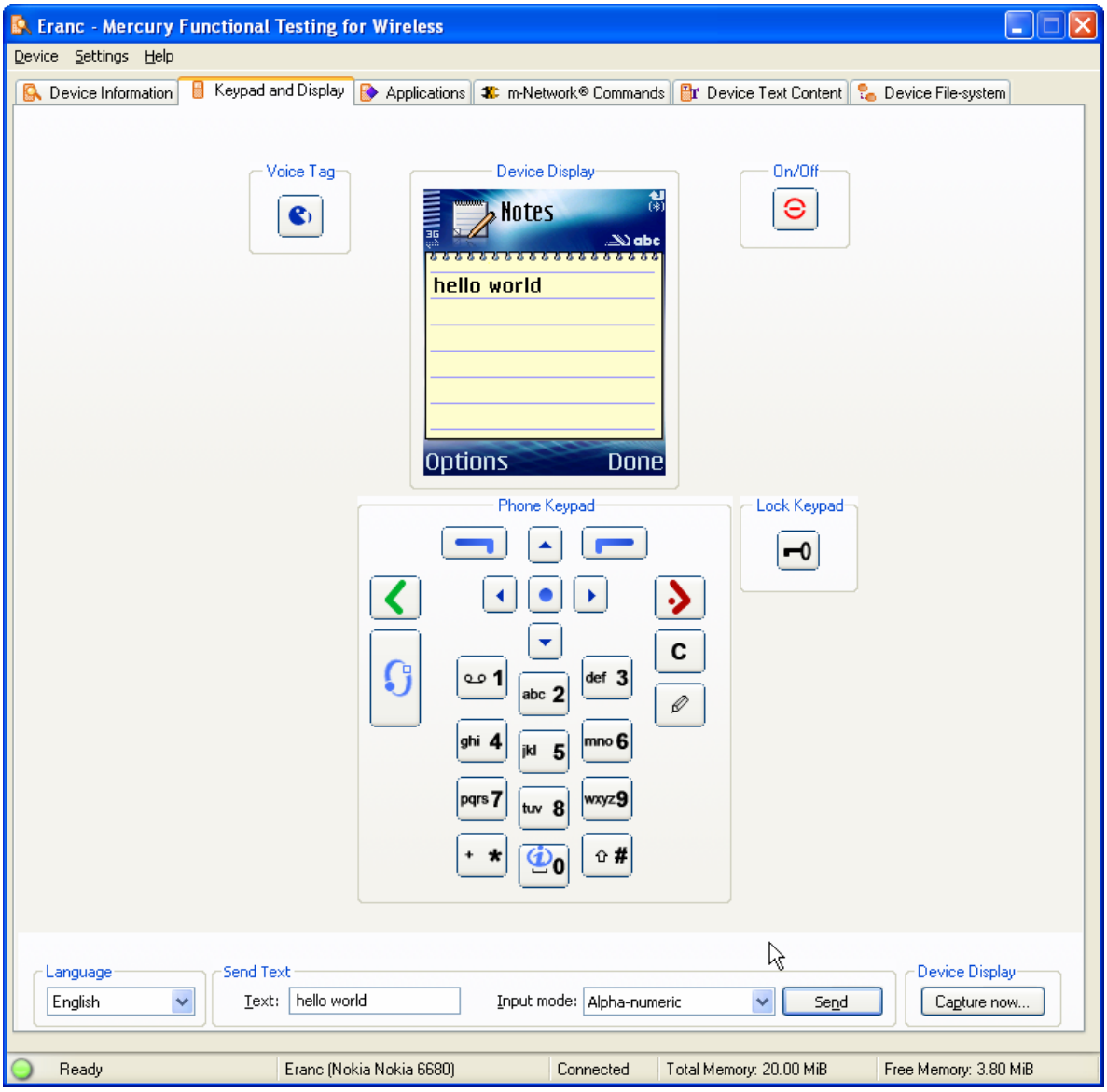


Sending text input

Mercury Functional Testing for Wireless provides a **Send Text** box as an alternative to clicking on the keypad. You can use this, for example, to type a name, phone number, or Web site address into an application.

To send text to the target device:

1. Go to the **Send Text** panel at the bottom of the **Keypad and Display** tab.
2. Enter the text or numbers in the **Text** box.
3. Select the **Input mode** that the application on the device is expecting.



The exact list of modes available depends on the application you are testing.

Click **Send**.

Mercury Functional Testing for Wireless transmits the text to the device exactly as if you had clicked on the various keys to create the text. This enables you to enter text efficiently for tests in which testing the keypad is not the main objective.

Using commands and scripts

One of Mercury Functional Testing for Wireless's powerful features is the ability to use m-Network commands. Commands can be easily executed on a connected device.

The Direct Commands tab provides the following direct command options:

- Clear output manually or automatically
- Prepend a directory to a command
- Write additional input to the standard input of the currently executing process
- Select and copy output

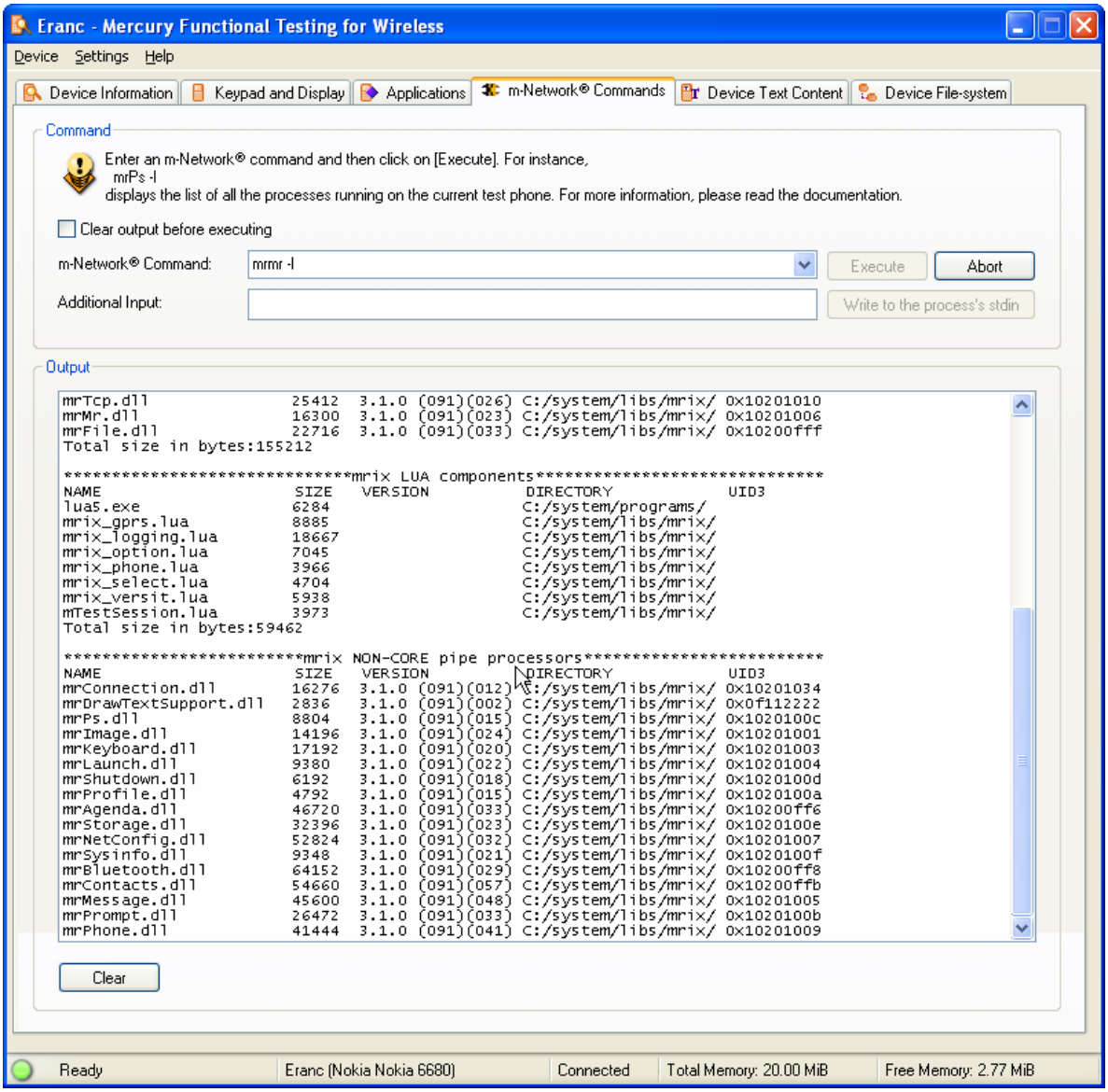
m-Network commands to a connected device

Mercury Functional Testing for Wireless supports a set of m-Network commands that you can send to a connected device for execution. The commands are executed by m-Network pipe processors that you install on the device when preparing to use Mercury Functional Testing for Wireless.

These enable you to interact directly with the software running on the device.

For example:

1. Select an active Device window.
2. Go to the **m-Network Commands** tab.
3. Type **mrcmd "mrMr -l"** into the m-Network Command field.
4. Click **Execute**.
5. Mercury Functional Testing for Wireless executes the command on the device, and displays the command output in the Output panel of the Direct Commands tab.



Tip: Use m-Network to populate items like contacts from a file through stdin before running an automated test.

In this example, the output is a list of m-Network pipe processors.

If a particular command can take additional input, the **Additional Input** field activates, and the command waits for you to provide the necessary input.

To use m-Network effectively, refer to its command reference documentation, which is part of the on-line help.

Clearing m-Network command output

Mercury Functional Testing for Wireless provides the following ways to clear the output of commands:

- Use the **Clear output before executing** option to make Mercury Functional Testing for Wireless clear output before each new command.
- Use the **Clear** button beneath the Output panel to clear the panel at any time.

- Right-click on the Output panel and select **Clear** from the popup menu.

Note: If you execute a command that can take additional input, then output arising from each fresh input is appended to the output display. Mercury Functional Testing for Wireless clears the output only when you issue a new command. For example, if you use the **Command** field to run cmd.exe, all output for the lifetime of cmd is appended to the output display. Mercury Functional Testing for Wireless clears the display when you terminate cmd and execute another command.

Note: All output is cleared, not just the selected line(s).

Capturing test information and results

Mercury Functional Testing for Wireless supports several ways to capture test information and results.

Mercury Functional Testing for Wireless supports:

- Capturing screenshots
- Using application text recognition
- Using Mercury Functional Testing for Wireless event logs

These options enable you to capture information manually or automatically so that you can process it offline. For example, you can compare screenshots to see whether a particular test has a consistent effect on a device's display, or analyze text to see whether an application is producing consistent output.

Capturing screenshots

Mercury Functional Testing for Wireless supports manual and automatic screenshot capture.

Manual capture enables you to capture a screenshot during a manual test, for example, if a test produces an unexpected change to the display.

Automatic capture enables Mercury Functional Testing for Wireless to take a screenshot whenever the display changes. When the display is constantly changing, for example, if the device is being used in camera mode, Mercury Functional Testing for Wireless takes periodic screenshots.

Mercury Functional Testing for Wireless uses the Portable Network Graphics format (.png) for screenshots, and files are typically just a few kilobytes in size.

Manual screenshots

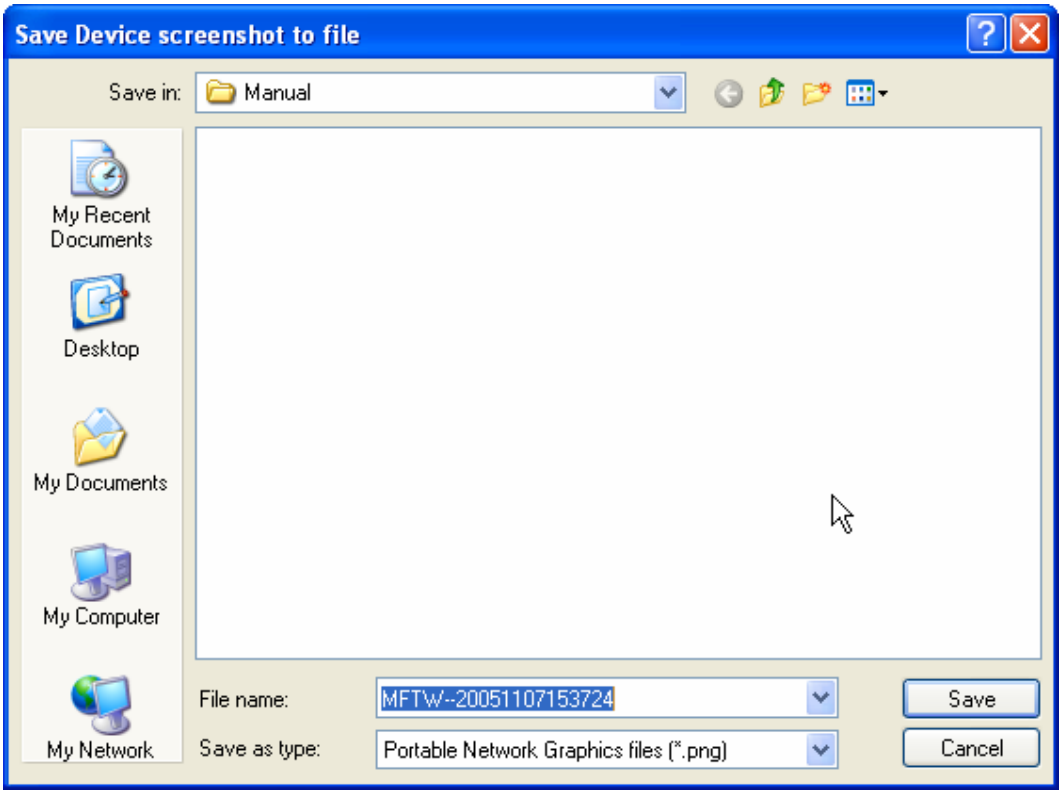
The **Keypad and Display** tab contains a **Capture Now...** button.

For example, clicking the Menu key brings up the phone menu on the device.

Device screen capture

To save a screen capture, press **Capture now...** and click **Save**

You can use the button at any time to capture the current appearance of the target device display.



Tip: Use the Configuration settings in the dashboard to set the prefix.

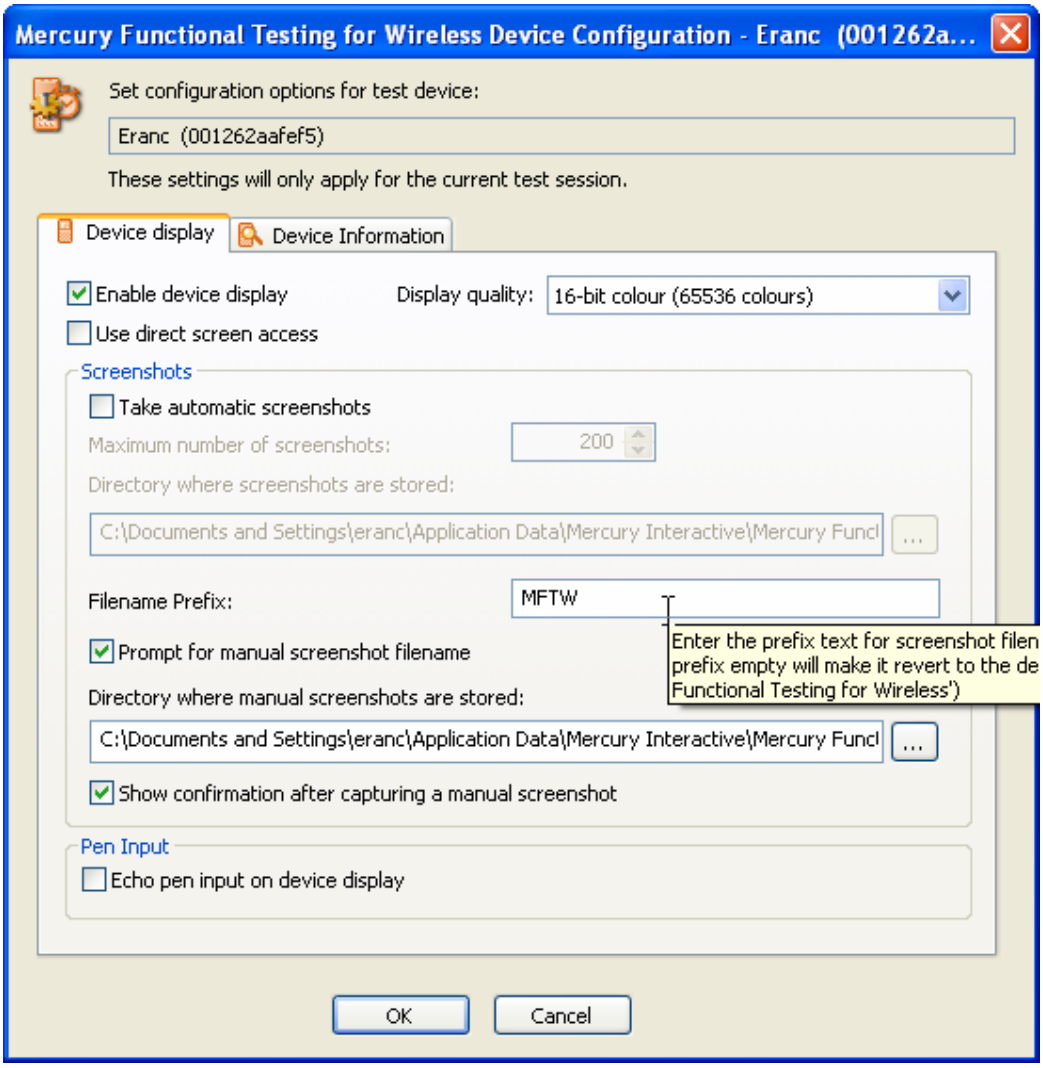
By default, Mercury Functional Testing for Wireless:

- Displays a success message when it saves a screenshot to file
- Saves files under C:\Documents and Settings for the user account, for example:

You can use the device display configuration options to change these behaviors, if required. For example, you can define your own filename prefix and disable the success messages.

Automatic screenshots

You can use the device display configuration options to enable automatic screen capturing. This feature makes it easy to capture display information during automated tests.



When enabled, Mercury Functional Testing for Wireless takes screenshots every time the target device display changes. When the display is constantly changing, for example, if the device is in camera mode, Mercury Functional Testing for Wireless takes screenshots periodically.

The options also enable you to define a file name prefix for screenshot files, choose the screenshots folder, and specify a limit to the number of screenshots Mercury Functional Testing for Wireless will create.

Note: If Mercury Functional Testing for Wireless reaches the file limit for automatic screenshots, it deletes the oldest file to make way for a new screenshot.

Using application text recognition

Mercury Functional Testing for Wireless provides powerful text recognition facilities that enable you to capture the textual output of an application during testing.

Using Mercury QuickTest Professional, you can create test scripts that react dynamically to application text.

Mercury Functional Testing for Wireless provides two views of captured text on the Target Device Text Content tab:

- The Standard view provides a simple representation of text on the target device display. This view does not attempt to display any information about the precise position of the various text items, or the fonts being used to display them on the target device.
- The Detailed view provides a list of the text elements on the target device, and provides tabulated information about fonts and positioning. The detailed view enables you to export the information to file.

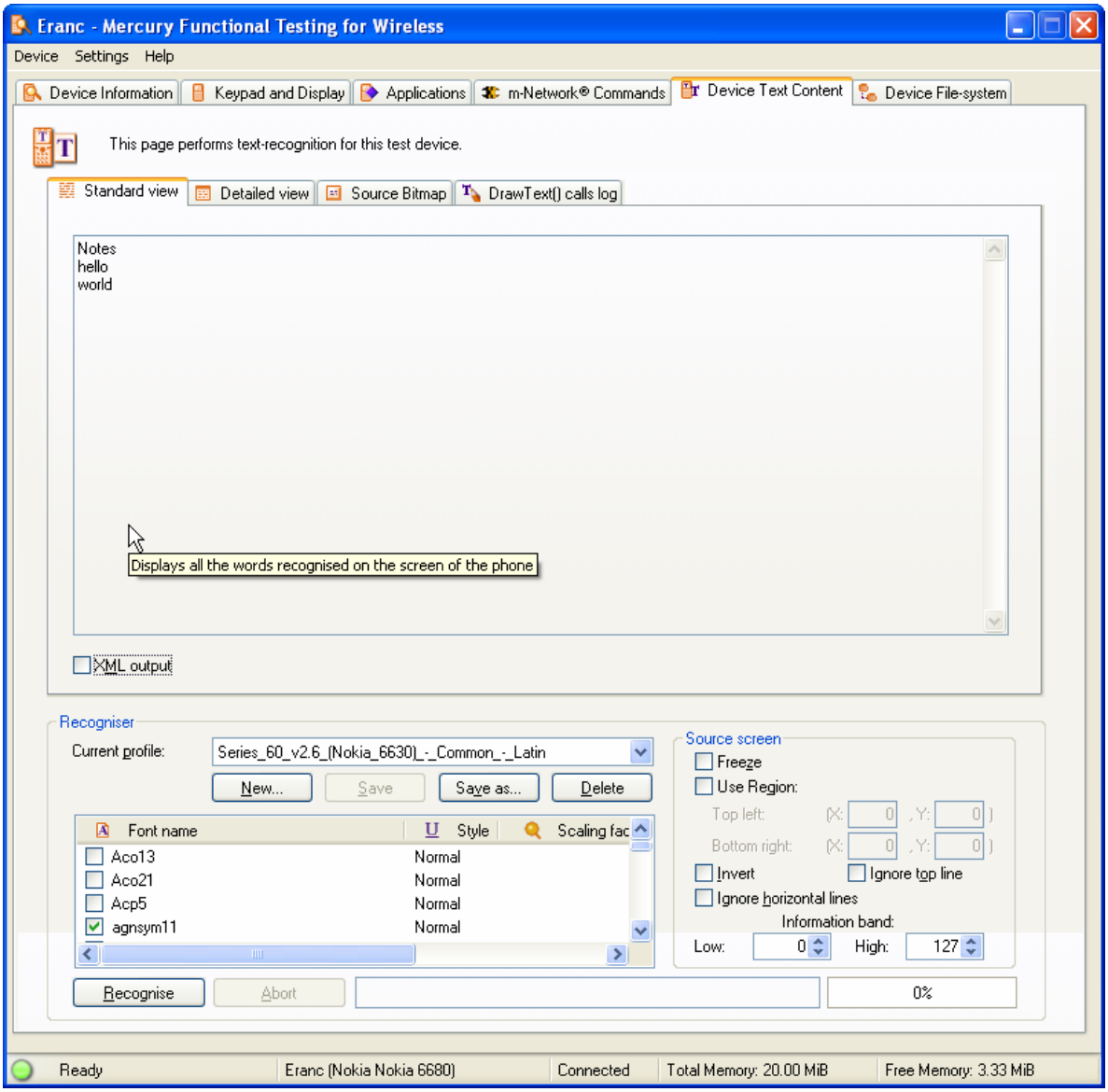
When you use the text recognition mechanism, you need to select a text recognition profile appropriate to the target device. Mercury Functional Testing for Wireless provides a set of profiles for supported devices, and you can edit them or create your own.

The text recognition mechanism provides several options that enable you to focus on a particular section of the target device display.

Note: The text recognition mechanism does not only recognize individual characters; its analysis enables it to recognize words. For example, Mercury Functional Testing for Wireless can recognize the word "Menu" rather than the individual letters "M", "e", "n", and "u".

Using Standard text display

On the Target Device Text Content tab, the Standard view provides a simple presentation of the text on the target device display, for example:



The view does not update dynamically. You need to invoke text recognition as follows:

1. Go to the **Target Device Text Content** tab.
2. Select a text recognition profile appropriate to the target device.
3. Set any text recognition options you require.
4. Click **Recognise** to invoke text recognition.

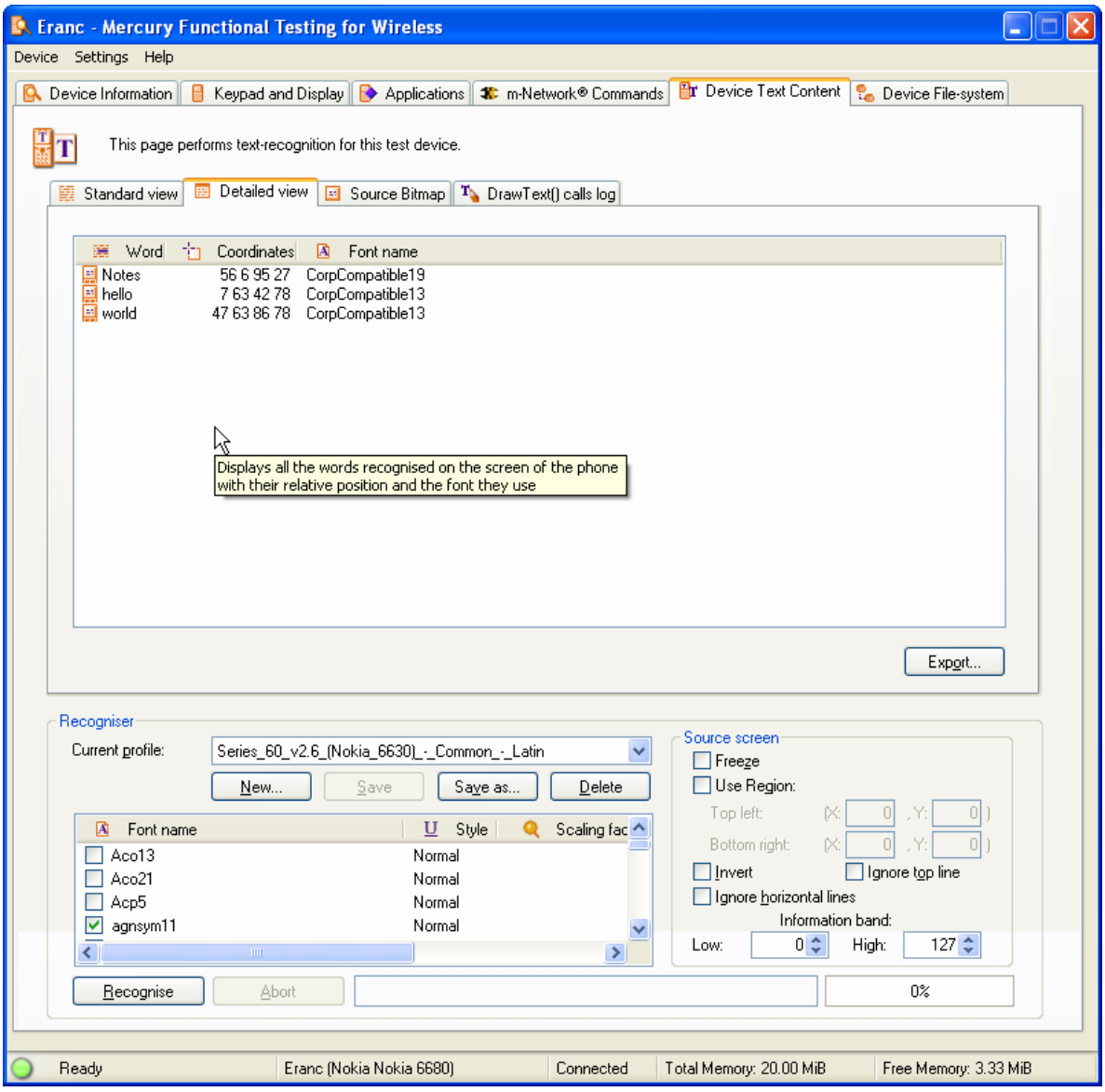
Text recognition takes a few seconds, depending on the complexity of the selected profile and options. Mercury Functional Testing for Wireless provides a progress indicator, and you can abort the process if you choose.

On completion, Mercury Functional Testing for Wireless updates the Standard view to show the text that it has recognized.

The appearance of the text in the Standard view depends on whether the **XML output** option was selected when you invoked text recognition.

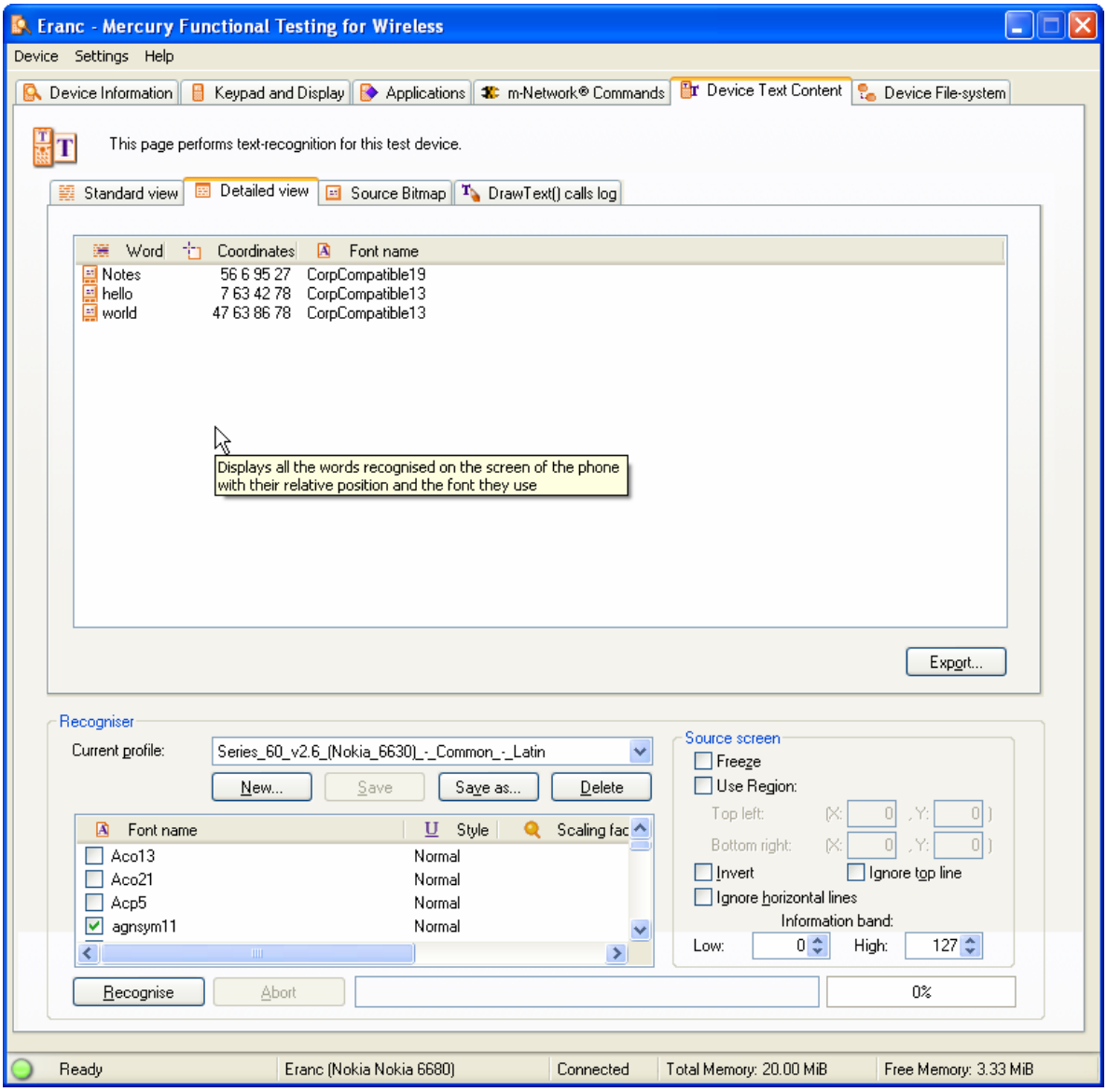
If XML output **was not** selected, the text is laid out in a simple representation of the way it appears on the target device display. For example, if two words appear on the same line in the target device display, then they appear on the same line in the Standard view.

If XML output **was** selected, the text is displayed in XML format. The XML includes font information and the position of the text on the target display. For example:



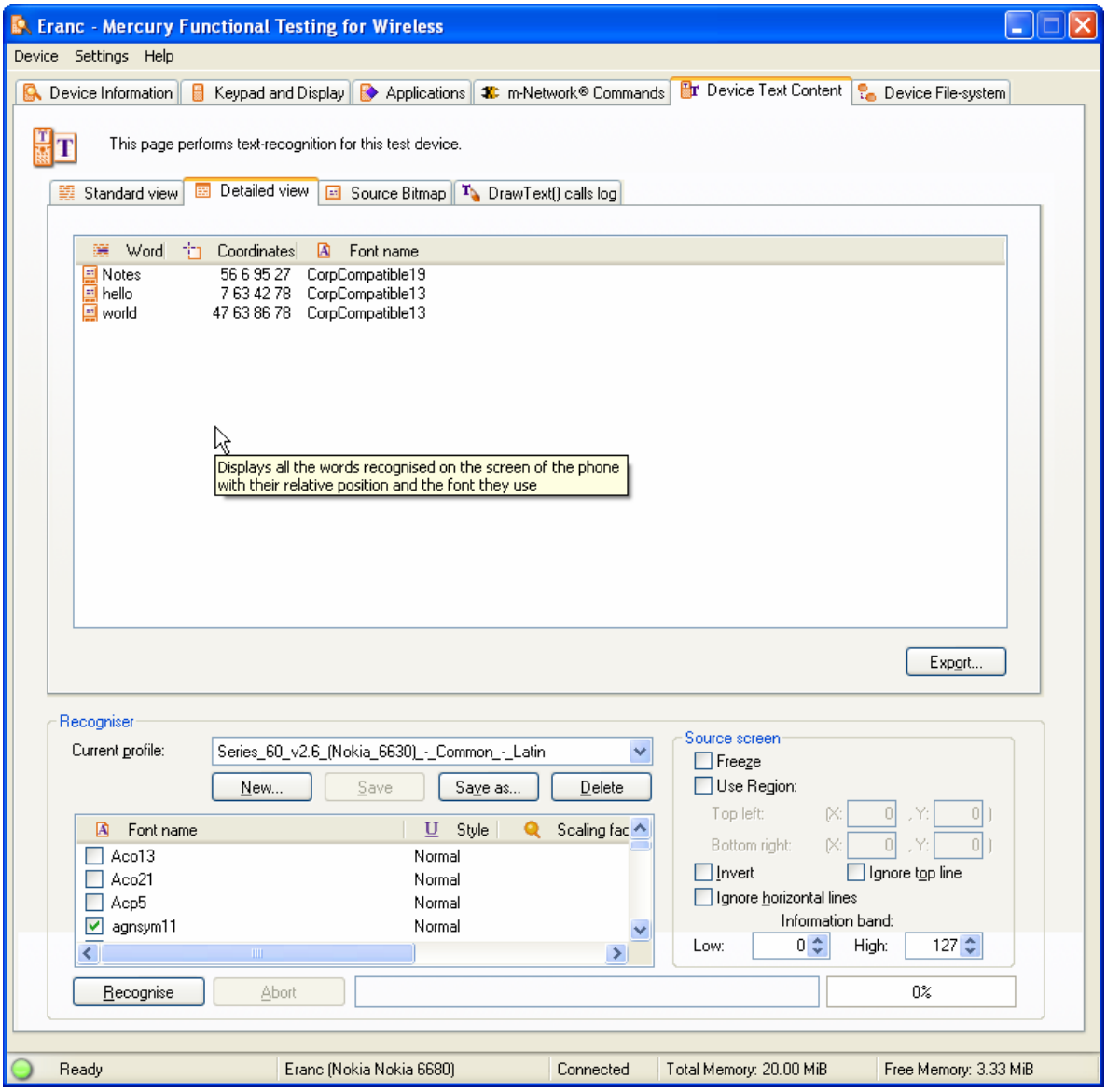
You can use Windows Copy/Paste to move the contents of the Standard view to a file, if required.

If you go to the Detailed view tab, the same text is shown with tabulated information about fonts and position.



Tip: You can export this data for further processing in **.csv** file format. Click **Export**.

If you go to the Source Bitmap tab, it is possible to see the screen being used for recognition. The screen can be frozen for pinpoint accuracy, and the region can be selected using the mouse or by typing coordinates into the Use Region fields in the Source screen region.



Tip: Narrowing down the region improves performance.

Using Detailed text display

The Detailed view provides tabulated information about the text recognized on the target device display. For each recognized text item or word, the view shows the text itself, the coordinates of the text on the display, and the font used on the display.

Exporting Detailed text analysis

On the **Target Device Text Content**, **Detailed view** tab, use the **Export...** button to export text information to a **.csv** (comma separated values) file.

Understanding text recognition

Mercury Functional Testing for Wireless uses text recognition profiles to determine which text fonts it needs to search for in a target device display.

Mercury Functional Testing for Wireless provides a set of profiles for the supported Smartphone devices, and you can edit them and create your own.

For example, Mercury Functional Testing for Wireless provides the following profiles for Series 60 version 2.6 devices:

- Series 60 V.26 Nokia 6630 Common
- Series 60 V.26 Nokia 6630 Common Latin

These profiles provide different levels of text recognition to suit different test scenarios.

If you compare the Common profile with the Latin profile, you will see that the Latin profile contains fewer font definitions. The Common profile enables Mercury Functional Testing for Wireless to recognize more words, but the Latin profile enables Mercury Functional Testing for Wireless to focus on the fonts that are typically used for a particular purpose, and ignore all other fonts. Thus, with some knowledge of an application, you can create and select profiles to optimize performance for different test cases.

Managing text recognition profiles

Mercury Functional Testing for Wireless provides a set of text recognition profiles, but you can edit them and create your own to suit your test scenarios and the font usage of particular applications. If you have particular requirements, contact your Mercury Functional Testing for Wireless representative to discuss how to extend the range of font definitions supported by Mercury Functional Testing for Wireless.

Each profile specifies one or more font definitions that Mercury Functional Testing for Wireless can recognize, for example:

- Alb19,0,1,0,256

You can create a new profile, as follows:

1. Go to the **Device Text Content** tab.
2. Click the **New...** button in the **Profile** area.

Mercury Functional Testing for Wireless creates a new profile file, and allows you to name it and select its target fonts and sizes.

Mercury Functional Testing for Wireless automatically adds the new file to the list of profiles you can select. Mercury Functional Testing for Wireless will also automatically add any other .ifp file you put into the same folder.

Tip: Mercury Functional Testing for Wireless provides a Common profile for each of the device types it supported. Each of the Common profiles contains a complete list of fonts that Mercury Functional Testing for Wireless can recognize for the relevant device type. The Common profiles are therefore a useful reference when creating and editing profiles.

Tip: If you use **Save As...** to create a new file, ensure that the text editor creates a file with the .ifp extension rather than .txt.

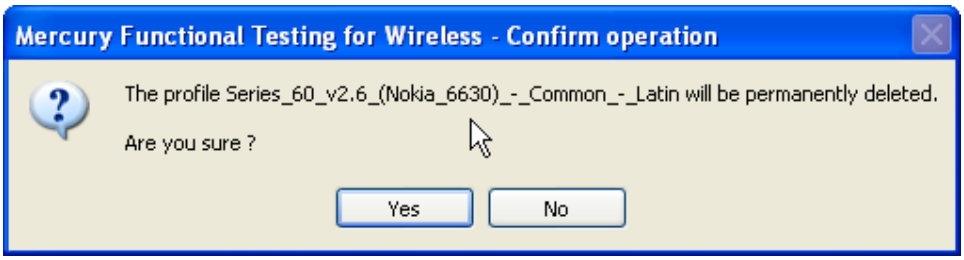
You can delete a profile, as follows:

Go to the **Device Text Content** tab.

Select the profile you want to delete in the **Current profile...** list.

Click the **Delete...** button.

Mercury Functional Testing for Wireless prompts for confirmation that you want to delete the file. Click **Yes**.



Mercury Functional Testing for Wireless displays a message to confirm that it has deleted the file. Click **OK**.

Understanding font definitions

The format of a font definition is as follows:

fontname,emphasis,scaling,firstchar,lastchar

where:

fontname is the name of a font, for example, Alb19. The font name indicates font size (in this case, 19).

emphasis can be:

0 (none or normal)

1 (bold)

2 (underlined)

scaling specifies a scaling factor for the font, usually 1.

firstchar and *lastchar* specify the range of characters to be recognized. For example 0,127 enables Mercury Functional Testing for Wireless to recognize most standard alphanumeric characters, but not characters with European diacritics or Unicode characters. A range of 0,256 includes most European diacritic characters, and a range of 0,65535 includes Unicode characters.

The time Mercury Functional Testing for Wireless takes to complete text recognition is related to the number of fonts specified in the selected profile, and the range of characters to be recognized for each font.

Mercury Functional Testing for Wireless supports a set of font definitions used by most applications on the supported devices. For each type of supported device, Mercury Functional Testing for Wireless provides a Common profile that includes the complete set of font definitions that Mercury Functional Testing for Wireless supports for that device type.

If you have requirements for additional fonts, for example, because you are developing a new application with unusual font requirements, your Mercury Functional Testing for Wireless representative to discuss how to extend the range of font definitions supported by Mercury Functional Testing for Wireless.

Setting text recognition options

Mercury Functional Testing for Wireless enables you to set a number of text recognition options.

XML output

Use this option to control whether Mercury Functional Testing for Wireless generates XML output or a simple text representation of the target device display in the Standard view.

This option has no effect on the Detailed view.

Use Region

Use this option if you want Mercury Functional Testing for Wireless to run text recognition on a particular area of the target device display, and ignore everything else, as follows:

1. Go to the **Target Device Text Content** tab.
2. Select the **Use Region** checkbox.
3. Specify coordinates for the top left and bottom right corners of the area you want Mercury Functional Testing for Wireless to analyze.
4. Click **Recognise** to run text recognition.

Mercury Functional Testing for Wireless displays an error dialog box you if you specify invalid coordinates.

Invert

Use this option if the application you are testing uses light text on a dark background.

Ignore top line

Use this option if the text you are analyzing is so closely spaced that one line of text prevents the next line from being analyzed accurately.

By default, the text recognition mechanism expects each character to be surrounded by white space. However, on some devices, lines of text are so closely spaced that underlined text, in particular, can render the line beneath it difficult to analyze. In such cases, you can use the **Ignore top line** option to ignore the row of pixels above a character that the analyzer normally expects to be white.

Threshold

Use this option to specify the level of darkness that Mercury Functional Testing for Wireless treats as black for the purposes of recognizing text. This option can be useful if you find that text recognition is inaccurately analyzing text on colored backgrounds, for example.

By default, any value below the threshold is treated as black. If you select the **Invert** option, values above the threshold are treated as black.

Using Mercury Functional Testing for Wireless event logs

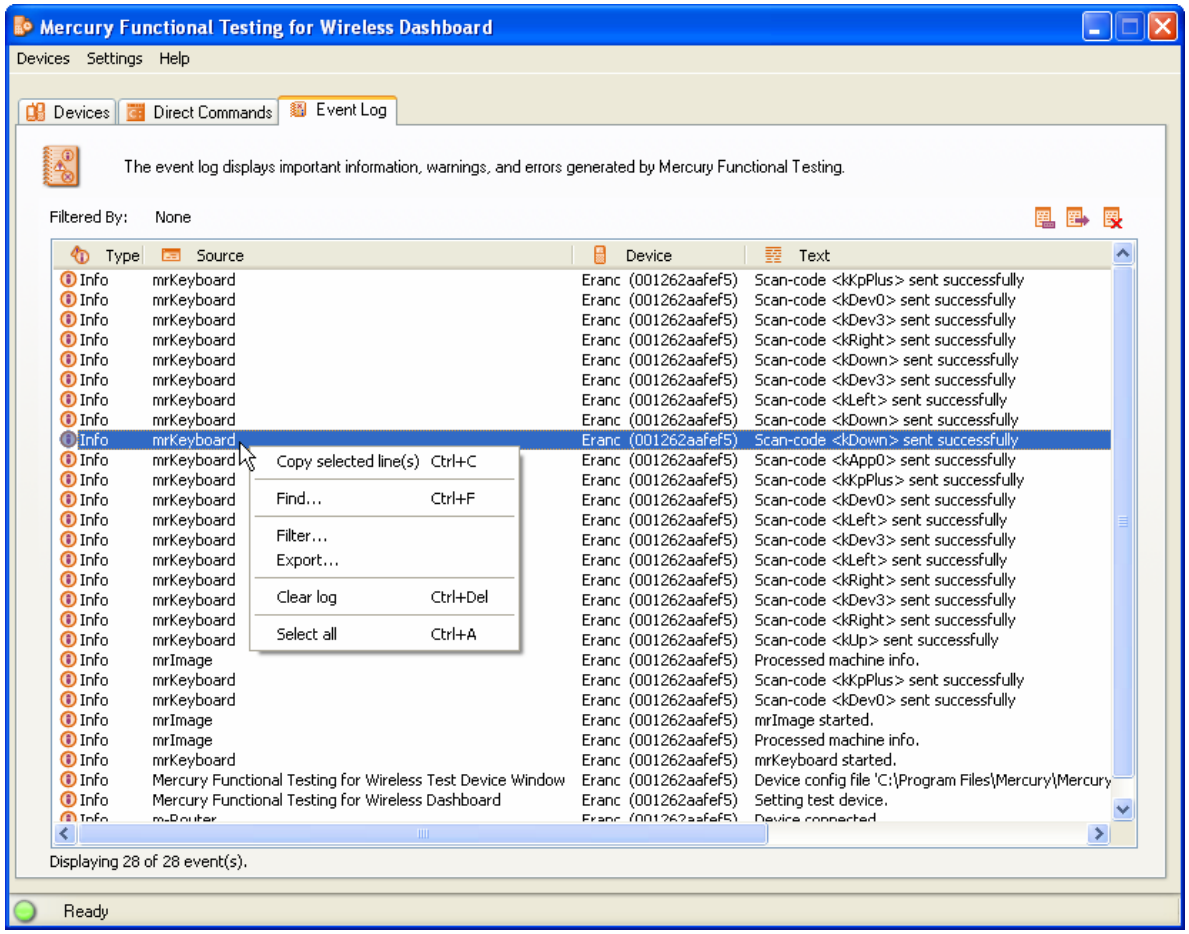
Mercury Functional Testing for Wireless generates Info, Warning, and Error events as required during normal operation.

You can:

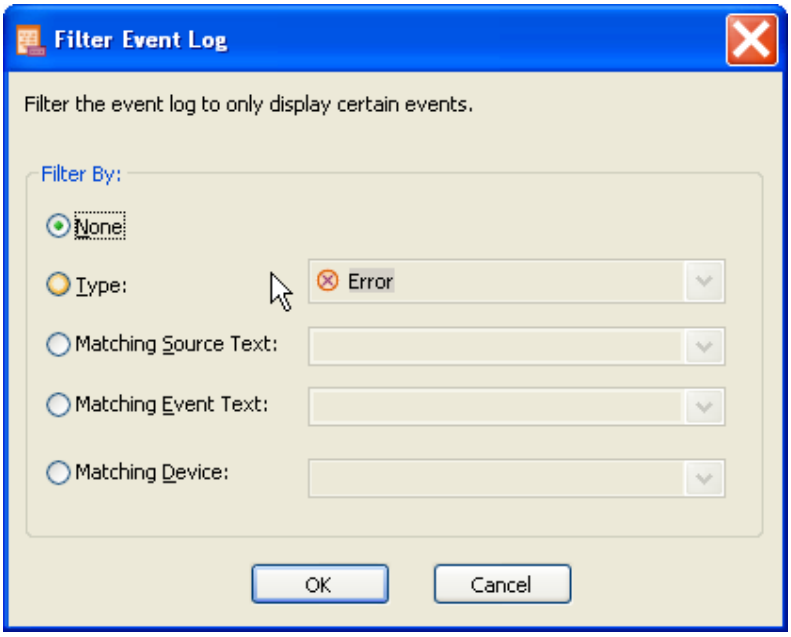
- Filter events
- Export events
- Clear events
- Limit the maximum number of events displayed

Filtering events

By default, Mercury Functional Testing for Wireless displays all events (subject to the maximum events setting) in the Event Log panel. You can filter events as follows:



1. Click the filter icon at the top of the Event Log panel (or right-click in the events list area and select **Filter...**).
2. Use the **Filter Event Log** dialog box to define a filter, and click **OK**.



The **Type** filter enables you to filter for Info, Warning, or Error events.

The **Matching Source Text** filter enables you to filter for events from a particular m-Network pipe processor, for example, when you click on a key on the Keypad and Display tab, Mercury Functional Testing for Wireless uses the mrKeyboard pipe processor. The drop-down list provides a list of pipe processors that Mercury Functional Testing for Wireless uses. You can use pipe processors directly on the Mercury Functional Testing for Wireless **Direct Commands** tab.

The **Matching Event Text** filter enables you to filter for events containing a particular text string that you specify. For example, you could use this filter to display events relating to a particular device by specifying its name or Bluetooth ID.

When you click **OK**, Mercury Functional Testing for Wireless applies the filter to the set of events currently displayed, and to all subsequent events.

Exporting events

You can export the events currently displayed in the Event log panel, as follows:

Click the export log icon (or right-click on the events list area and select **Export...**)

The **Save Event Log** dialog box appears.

Specify a file name and location, and save the log file.

Clearing events

You can clear the event log, as follows:

1. Click on the clear event log icon (or right-click on the events list area and select **Clear log...**)

Mercury Functional Testing for Wireless clears the events list area.

Using Mercury Functional Testing for Wireless with QuickTest Professional

Mercury Functional Testing for Wireless is a powerful application, and becomes even more powerful when used in conjunction with QuickTest Professional, which enables you to record and automate interactive test procedures. For example, Mercury QuickTest Professional enables you to record a test and repeat it exactly, or repeat it with different parameters. For further information on how to use Mercury Functional Testing for Wireless in this way, contact your Mercury Functional Testing for Wireless representative.

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