



Zebra Device Diagnostics Tool User's Guide

June 2015 V1.4

1. Overview

The Device Diagnostic Tool is a powerful and friendly utility that determines the health of your Zebra Mobile Computer supporting our Device Diagnostic Service. Where appropriate, Zebra Help Desk will use the Tool for troubleshooting device issues, relying on the results to provide you with the most optimum steps to reach a resolution. This version is available for Windows Mobile and WinCE Enterprise Devices.

2. Installation

Two options are provided to support the installation of the Tool:

2.1 Staging Barcodes:

Relying on the Rapid Deployment (RD) Client^(*) most Zebra Mobile Computers have, you can proceed as follows:

- Enable WiFi / Internet access in your device
- Activate the Rapid Deployment Client
- Scan Barcodes. Wait for files to be downloaded in your Zebra Mobile Computer. A .CAB file will be downloaded to complete tool installation.

() Psion devices do not carry the RD client.*

2.2 A .cab file is supplied for installation.

To install:

- Copy Zebra Device Diag Tool.cab to the Mobile Computer
- Execute the cab file to install it. The following files are installed:
 - \Program Files\Zebra Device Diag Tool\Zebra Device Diag Tool.exe
 - \Program Files\Zebra Device Diag Tool\SelfDiagnosticSetting.txt
 - \Program Files\Zebra Device Diag Tool\Zebra Device Diag Tool Silent.Ink
 - \Program Files\Zebra Device Diag Tool\Zebra Device Diag Tool.Ink
 - \Windows\Start Menu\Programs\Zebra Device Diag Tool.Ink
 - \Windows\Start Menu\Programs\Zebra Device Diag Tool Silent.Ink

Click on Zebra Device Diag Tool.exe to start the application and bring the user to the main menu. Alternatively, the two shortcuts are placed in the programs subdirectory and can be used instead.

3. Interface Specification

The diagnostic tool can be run using a menu option or in a background mode as follows:

- Zebra Device Diag Tool – Starts it with a User Interface for the user to select individual tests.
- Zebra Device Diag Tool /Silent – Starts it with no GUI. It will run the configured tests and then exit.

The results, in addition to being displayed on the GUI will also be appended to the log file “\Application\SelfDiagTool.log”. The size of the log will be limited to 256Kb. When the log exceeds this size, it will be copied to “Application\SelfDiagTool.bak” and a new “\Application\SelfDiagTool.log” log file will be started.

All tests run execute a direct comparison of the actual parameter status against the specific device operational specifications. Environmental parameters will be red when the snapshot reading surpasses accepted levels, while other parameters fully dependent of further configuration or enablement (WiFi Radio On/Off, WLAN SSID assigned, etc), will reported according to their specific status.

In general terms:

Green: Test executed and passed. Parameter is under specs or fully enabled/activated.

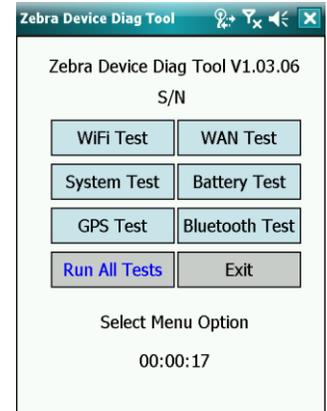
Red: Test executed and not passed. Need to review specific spec or further configuration required.

Gray: Test not supported on device (GPS, etc) or it's related to a disabled feature within the Mobile Computer.

3.1. Main Menu

See graphic to right for the main menu. At the top of the dialog, the name of the tool and the current version is given. On the next line, the serial number of the device is displayed. Pressing a button will take you to the following tests:

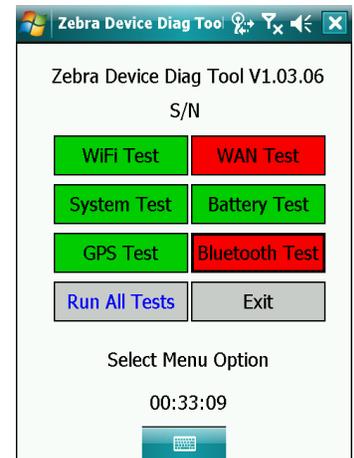
- WiFi Test – Displays information concerning the WLAN Radio on the device.
- WAN Test – Displays information concerning the WWAN Radio on the device.
- GPS Test – This is a time consuming test (lasts 10 minutes) to check on the health and status of GPS.
- Bluetooth Test – Displays information concerning the WPAN Radio on the device.
- Run All Tests – Execute the WiFi, WAN, System, Battery, GPS, and Bluetooth Tests in sequence.
- Exit – Exit the program.



All of the tests on the menu can be Enabled/Disabled by setting the corresponding flag in the SelfDiagnosticSettings.txt file to 0 instead of 1. Section 4 describes the format of this file.

It is recommended that all tests to be performed while the device is in normal use, not in a cradle which is connected via a USB cable to a computer. The ActiveSync connection may prevent some test from running successfully, as the function can be disabled while at the cradle: WLAN vs. LAN conflict, etc.

Once a test has been executed, the background of the button will be changed to indicated the success or failure of the underlying tests. If the background is Green, the test passed. If the background is Red, the test failed. If the test remains Gray, then the test isn't supported on that device or was disabled. For example, not all of our devices support WWAN or GPS and thus those tests would merely remain with Gray backgrounds.

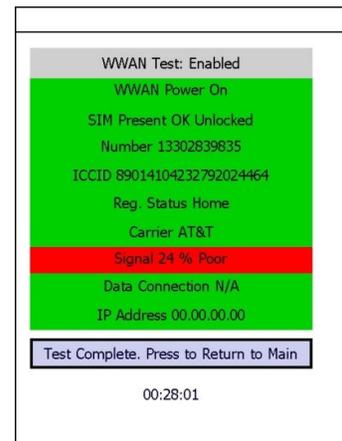


The graphic on the right depicts the main menu after all of the tests have been executed. Note that the WAN Test has failed. To determine the failure, you can either look at the log file or go and run the test again.

3.2. WWAN Diagnostics

Selecting "WAN Test" from the main menu will execute diagnostics on the Cell Radio. The WWAN Diagnostics will interface with the hardware using Microsoft's Connect Manager, TAPI, and RIL API's to obtain the following information:

- Current WWAN Power State of the Cell Radio.
- For devices using GPRS, presence of the SIM card and whether it is locked or unlocked.
- WWAN Phone Number.
- ICCID.
- WWAN's registration status.
- Carrier Information.





- Signal Strength.
- State of Data Connection.
- WWAN IP Address if data connection is valid.

If the Cell Radio is not present, this will also be logged and this test may be skipped. The test will fail if the power to the cell radio is off, the ICCID couldn't be read, phone number couldn't be read, registration status couldn't be found, carrier couldn't be found, or the signal strength was below 30%.

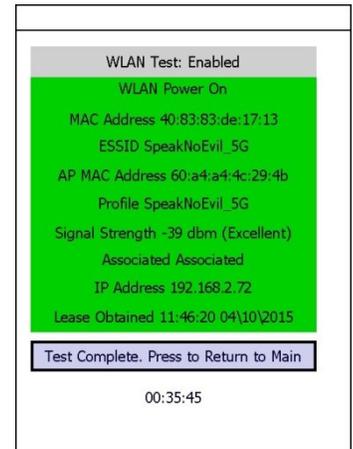
If the Cell radio is not present or disabled, this will be logged and this test may be skipped. At the conclusion of the test, a button will be activated to allow the user to return to the main menu if the menu was being displayed.

This information can also be used as a quick way of determining if the device's WWAN is configured correctly.

WLAN Diagnostics

The WLAN Diagnostics interfaces with the hardware using the Fusion API's from Zebra's EMDK for "C" to obtain the following information:

- Current WLAN Power State.
- MAC Address.
- ESSID of Access Point.
- MAC Address of Access Point.
- Name of Current Active Profile.
- Current Signal Strength.
- Current status of association with the access point.
- WLAN IP Address.
- Time at which last lease was obtained.
- Time at which lease expires (not displayed).



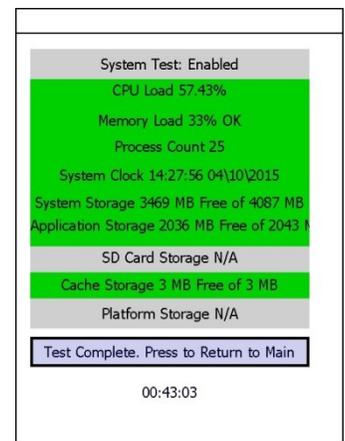
If the WiFi radio is not present or disabled, this will be logged and this test may be skipped. At the conclusion of the test, a button will be activated to allow the user to return to the main menu if the menu was being displayed.

This information can also be used as a quick way of determining if the device's WLAN is configured correctly or whether there is any connection with the AP or network.

3.3. System Diagnostics

The System Diagnostics will interface with the hardware using various Microsoft API's to obtain the following information:

- Current CPU Load.
- Current Memory Load.
- Number of Processes currently running.
- Current Battery Drain.
- Current Time.
- Amount of System storage available.
- Amount of Application storage available.
- Amount of SD Card storage available, if present.
- Amount of Cache storage available, if present.
- Amount of Platform storage available, if present.

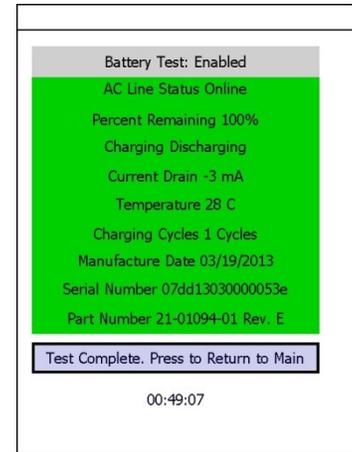


At the conclusion of the test, a button will be activated to allow the user to return to the main menu if the menu was being displayed. These tests can be used to determine if the CPU or Memory loads are too high, that there are too many processes running on the device, or that storage on the device is almost full.

Battery Diagnostics

The Battery Diagnostics will interface with the hardware using Microsoft’s Battery API’s and Motorola’s EMDK for “C” to obtain the following information:

- Whether device is on AC or Battery Power.
- Percent of Battery Life Remaining.
- Whether battery is charging or discharging.
- Current Battery drain.
- Current Battery Temperature.
- Number of Charge Cycles used by battery.
- Manufacture date of the battery.
- Battery’s serial number.
- Battery’s part number.



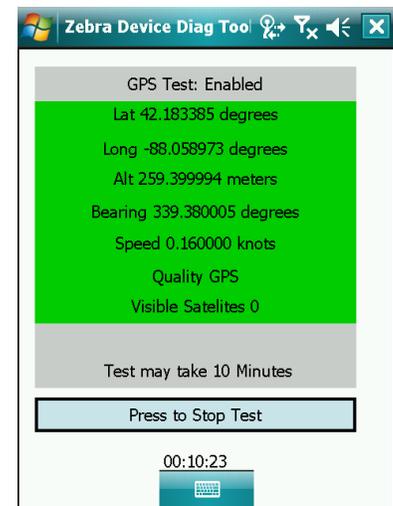
At the conclusion of the test, a button will be activated to allow the user to return to the main menu if the menu was being displayed. These tests can be used to determine if the batter is over or under temperature, too much drain on the battery by the device, or whether it is time to replace the battery.

3.4. GPS Diagnostics

The GPS Diagnostics will interface with the hardware using Microsoft’s GPS API’s to obtain the following information:

- Latitude
- Longitude
- Altitude
- Bearing
- Speed
- Signal Quality
- Number of Satellites that can be seen by the radio.

Unlike the other tests, which are taking a snapshot of the system, this test will periodically receive information from the GPS Radio. It can take several seconds of polling data before the data becomes reliable and the user will see valid data. If the data is Grey, then either the device doesn’t support GPS or the GPS radio is turned off.



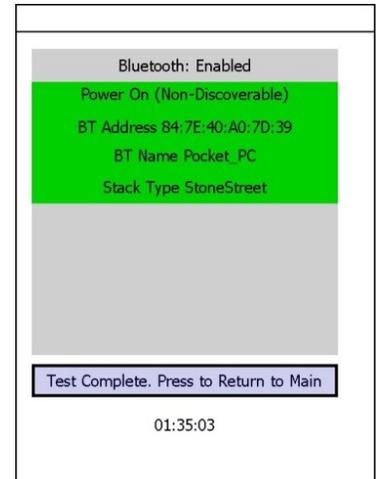
If the data has a Green background but the Longitude and Latitude are both 0, then GPS is active, but then either there are no satellites in range or the system is still collecting data before it can be displayed. Pressing the “Stop” button will halt the test at any time.

3.5. Bluetooth Diagnostics

The Bluetooth Diagnostics will interface with the hardware using Microsoft’s Bluetooth API’s and Stonestreet’s Bluetooth SDK which is included with Motorola’s EMDK for “C” to obtain the following information:

- Bluetooth Radio On / Off. If radio is on, whether it is discoverable or not.
- Bluetooth Radio’s Address which can be used by other devices to establish a connection.
- Bluetooth Radio’s Name.
- Bluetooth Radio’s Stack. Either the Microsoft or StoneStreet stack will be shown.

This test can be used to determine the status of the Bluetooth radio on the device.



3.6. Exit

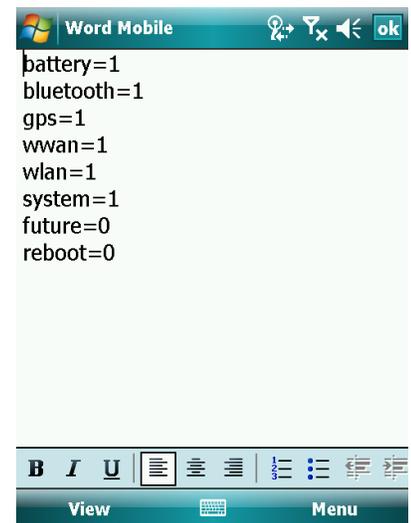
Pressing this button causes the program to exit.

4. Format of SelfDiagnosticTests.txt

The format of selfdiagnosticsettings.txt is as follows:

- Battery=1
- Bluetooth=1
- GPS=1
- WWAN=1
- WLAN=1
- System=1
- Future=0 *(To be included in future release)*
- Reboot=1 *(To be included in future release)*

Each line represents one button on the main dialog. If set to one, the button is enabled. If set to 0, the button is disabled.



Revision History

Revision	Comment	Date
1.0	Initial revision.	05-29-2015
1.1	Added DEMO Tool Version details	06-08-2015
1.2	Updated Windows Mobile Screenshots: .txt file content	06-23-2015
1.3	Updated WLAN Tests Nomenclature	07-14-2015
1.4	Updated Installed Files Names & Locations	07-21-2015

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