



Test a WR44v1 Router

How to test a WR44v1 router step by step.

**Technical Support
March 2016**

Contents

1	Introduction	3
1.1	Outline	3
1.2	Assumptions	3
1.3	Corrections	3
1.4	Version	3
2	Equipment Required	4
3	Set up the test equipment	5
4	Perform Low Level Tests	7
5	Program the Flash	8
5.1	Using Flashwriter	8
5.2	Reviewing Flashwriter error messages.....	15
6	Check LEDs	16
7	Check W-WAN connectivity	17
7.1	Test SIM detection switch	17
7.2	Test SIM 1.....	17
7.3	Test SIM 2.....	20
8	Check W-WAN Signal Strength	22
9	Check USB ports.....	23
10	Check ETH ports 1 to 3.....	24
11	Check serial ports.....	25

1 INTRODUCTION

1.1 Outline

This guide will enable a competent technician to test the hardware of a WR44V1 router.

If the tests in sections 4 – 11 all complete without a problem then the router can be returned to service. If not please follow the advice in the documentation below for the error message you receive.

The guide makes no assumption about the state of the flash; it will work even if the system flash is completely blank.

1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the product.

This guide assumes that there are no daughter cards fitted to the WR44. (E.g. GPS, serial, PSTN, ISDN, Telemetry etc). If a daughter card is fitted please request additional testing steps from tech.support@digicom.com.

This note applies only to a WR44V1

1.3 Corrections

Requests for corrections or amendments to this documentation are welcome and should be addressed to: tech.support@digicom.com

Requests for new quick notes can be sent to the same address.

1.4 Version

Version Number	Status
0.6	Draft
1.0	Completed 16/07/2015
1.1	Rebranding + screenshot update

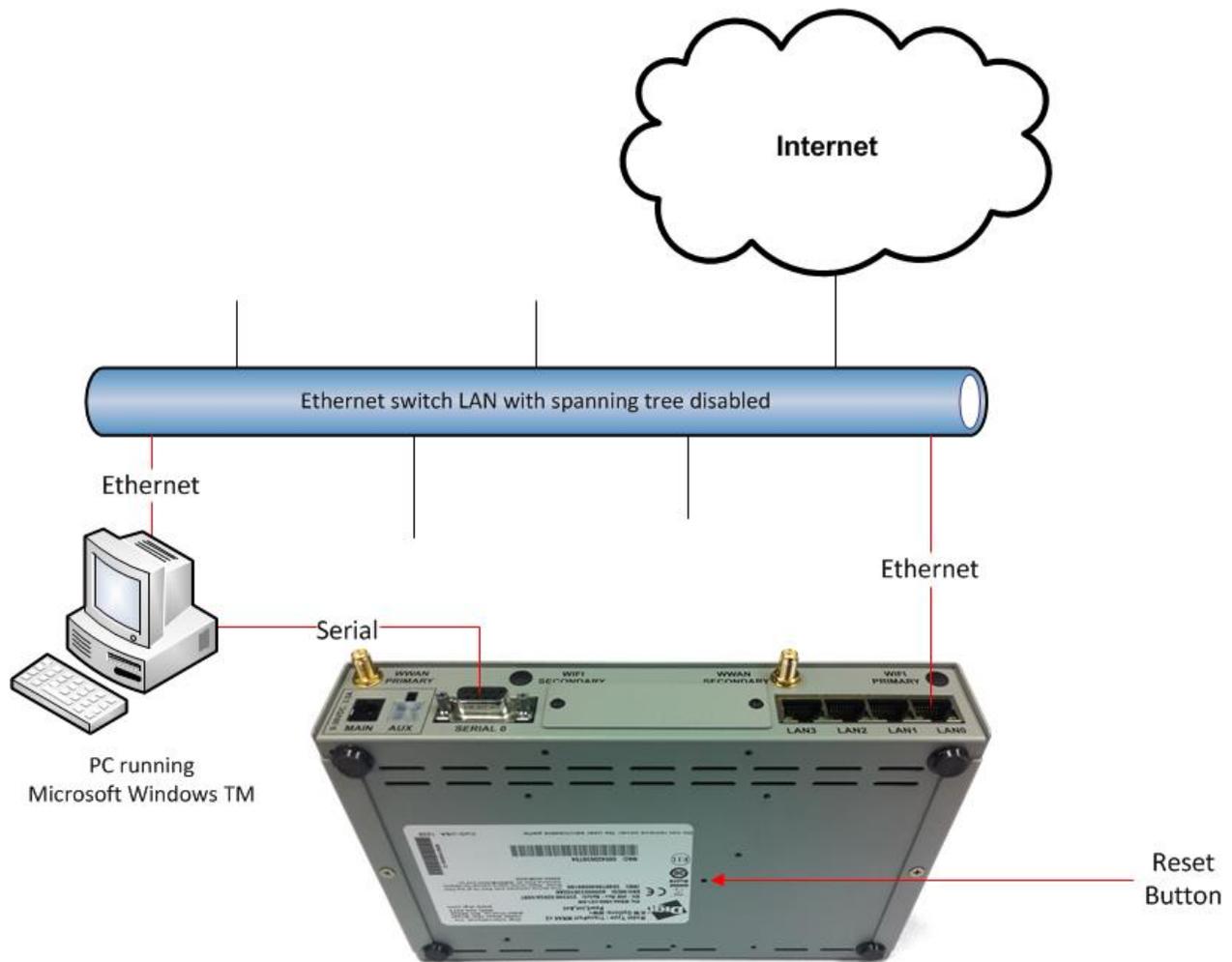
2 EQUIPMENT REQUIRED

1. A PC connected to the Internet running a Microsoft Windows TM operating system with a built in serial comm. port. (USB to serial adaptors do **not** work well.)
2. A 9-way to 25-way “straight through” serial cable to connect the PC directly to the WR44v1.
3. An Ethernet switch/hub to connect the PC to the WR44v1 (usually your normal office Ethernet switch/hub will be fine if there is a spare port and it is NOT running spanning tree.)
4. CAT 5 cables to connect the WR44v1 and PC to the Ethernet switch.
5. A pen or paper clip which can easily de-press the WR44v1’s reset button

3 SET UP THE TEST EQUIPMENT

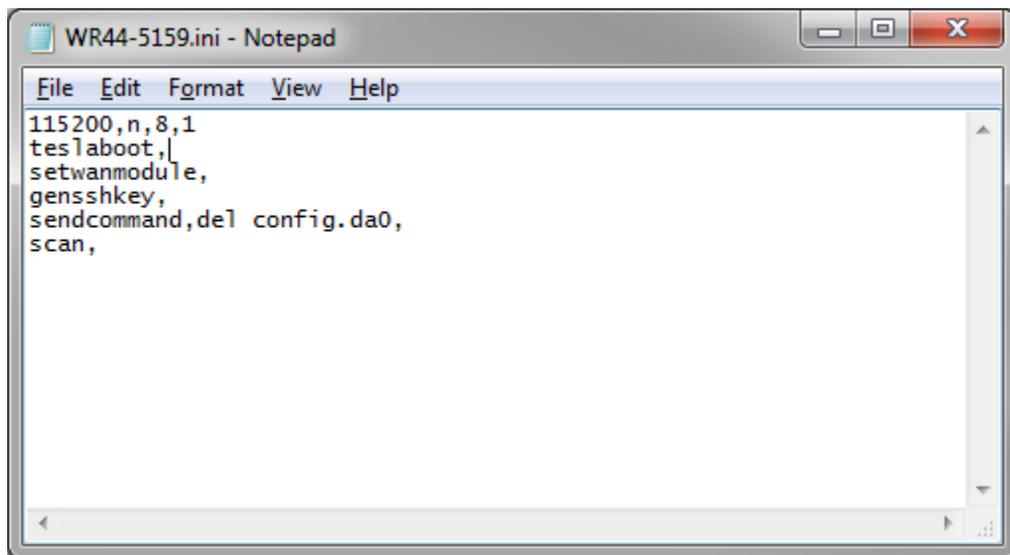
Set up the test equipment as described below.

- Connect LAN 0 of the WR44V1 to the switch/hub.
- Connect “ASY 0” the WR44V1 to the PC’s serial port 0 ideally “COM 1”.
- The Internet connection is optional and will be useful if help is required during this process from Digi Technical Support.
- Please note that the Ethernet switch/hub must not have the spanning tree protocol enabled. It is possible to use another appropriately configured WR44V1 as a switch/hub.
- It is essential that the PC’s Ethernet communication interface is configured correctly and has an IP address. The best strategy is normally to connect both your PC and the WR44V1 to your normal office LAN.
- Locate a suitable implement to depress the reset button when required.



How to test an WR44V1 step by step.

- Next download the following file:
<http://ftp1.digi.com/support/firmware/transport/utils/teslatest.zip>
- Extract the contents of the zip file to the “Windows” folder of the test PC.
- Download the latest WR44V1 Flashwriter zip file and extract the contents to a single folder on your PC:
<http://ftp1.digi.com/support/firmware/transport/flashwriter/archived-versions/XXXX/WR44/WR44-XXXX.zip> where **XXXX** is the current firmware version.
- Open the .ini file extracted and add the following text to the second line (be sure to include the comma):
teslaboot,



- Save the changes to the ini file.
- Finally download and install the latest version of Flashwriter
<http://ftp1.digi.com/support/firmware/FlashWriter.msi>

4 PERFORM LOW LEVEL TESTS

Connect the serial port of the PC to the WR44V1 using the serial cable.

From the Windows command line run the teslatest program including as an argument the PC com port number:

```
teslatest -p 1
```

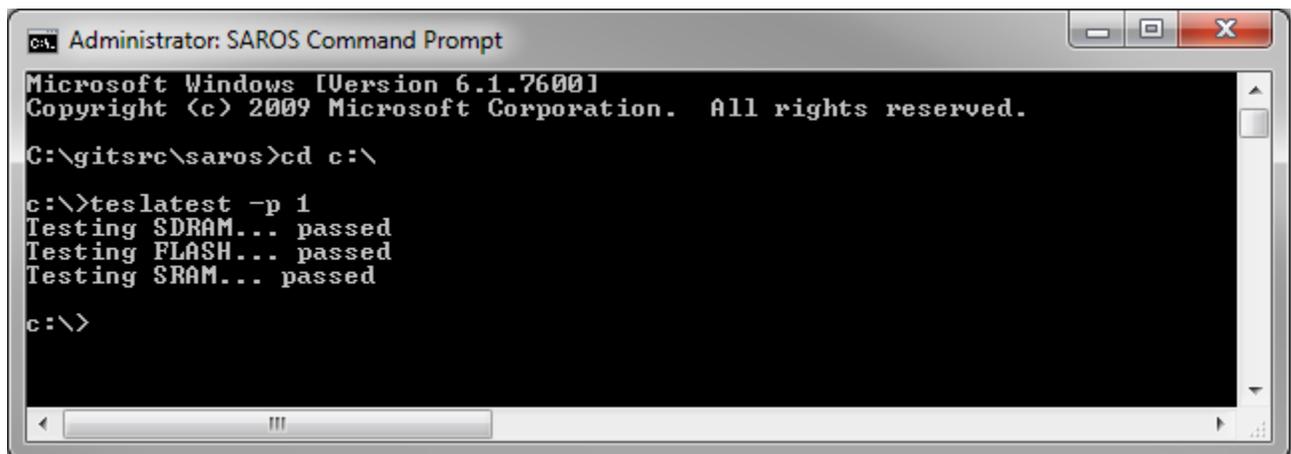
(E.g. for COM port 1)

```
teslatest -p 2
```

(E.g. for COM port 2)

Hold the reset button in and then power up the WR44V1. This may take a little practise.

Check the output of the teslatest program. If the test passes then the following output will be seen:



```
Administrator: SAROS Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\gitsrc\saros>cd c:\

c:\>teslatest -p 1
Testing SDRAM... passed
Testing FLASH... passed
Testing SRAM... passed

c:\>
```

If the SDRAM, FLASH or SRAM test fails then the product should be returned via RMA. When requesting the RMA please include the appropriate fail reason:

Teslatest fail: SDRAM

Teslatest fail: FLASH

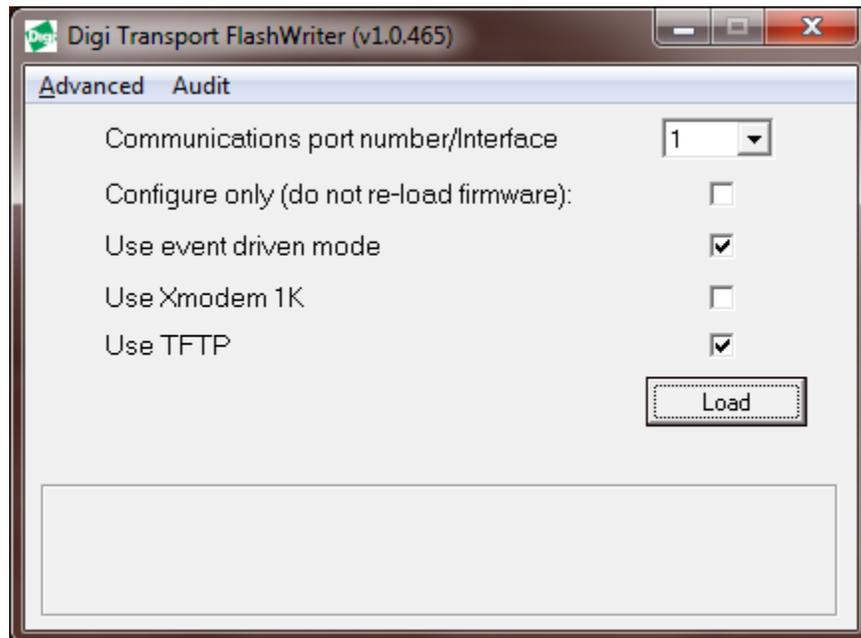
Teslatest fail: SRAM

5 PROGRAM THE FLASH

Please note that the most likely reason for this step to fail is due to an issue or configuration problem with the test equipment. For this reason please verify that the steps below can be performed on a known working WR44V1 without issue.

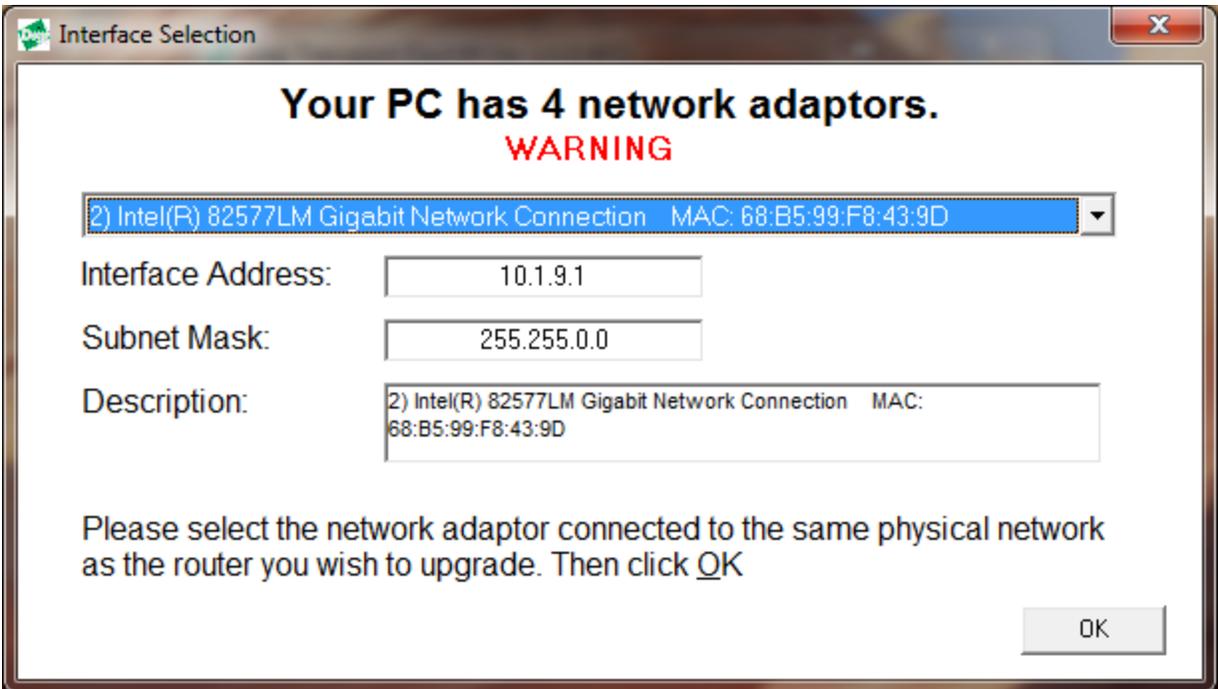
5.1 Using Flashwriter

Launch Flashwriter from the start menu. Select the communications port number (PC comm. port number) to which the WR44v1 is connected. (On most PC's with a built in serial port, this will be "1" OR "2". Leave the other settings are their default values (TFTP and Event driven mode ONLY ticked):

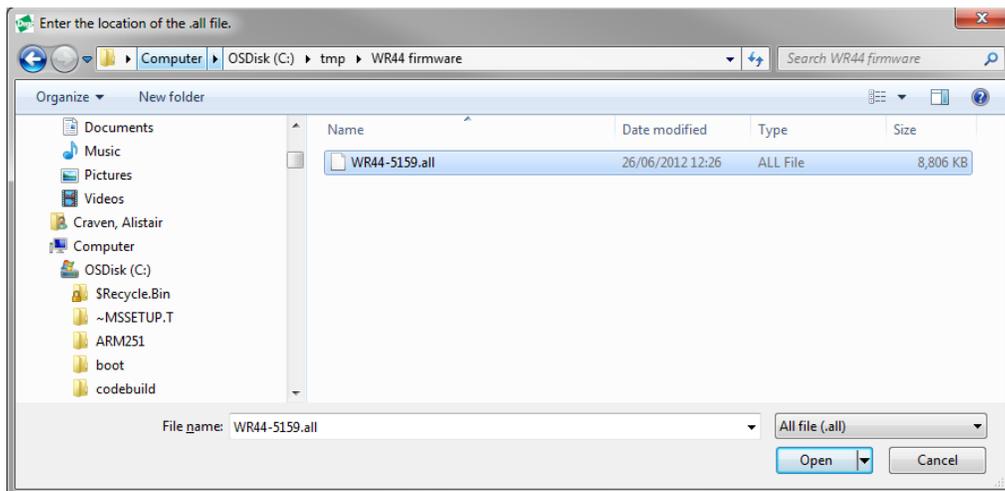


If your PC has more than one network adapter, be sure to select the one that represents the connection to LAN illustrated in section 0. If your PC only has a single network adapter this screen will not appear:

How to test an WR44V1 step by step.

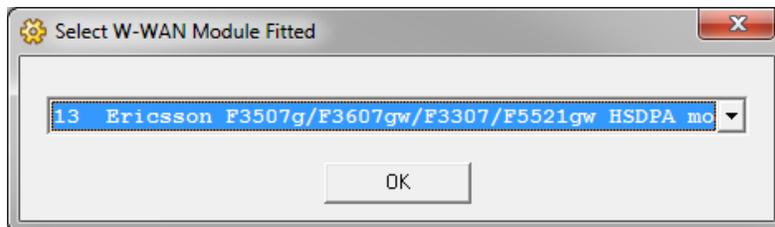


In the file dialogue, select the “ALL” file you extracted from the ZIP earlier:



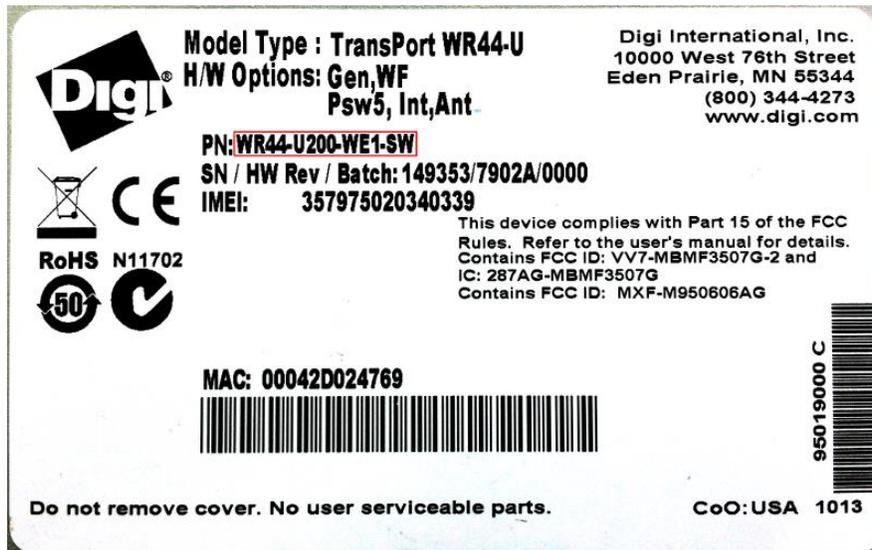
And click “Open”.

The following message will appear:



How to test an WR44V1 step by step.

It is critical that the correct selection is made at this point. Note characters 6 and 7 of the part number (SKU) on the approval label. In the example below these are “U2”:

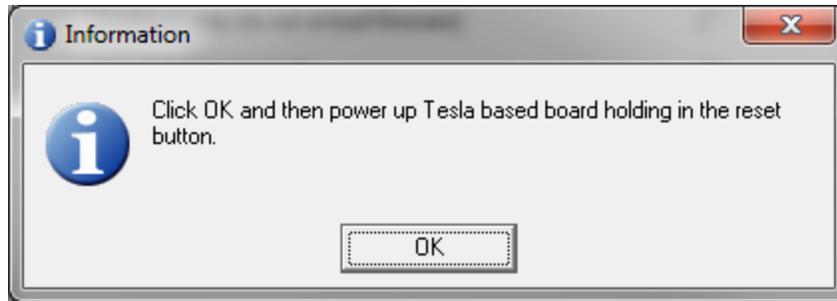


Refer to the following table to determine which selection to make:

Characters 6 & 7	Flashwriter Selection
00	100 No module
G1	5 Cinterion/Siemens MC75i/TC63i/MC75
E1	5 Cinterion/Siemens MC75i/TC63i/MC75
H0	9 Option HSDPA/HSUPA modules
H1	9 Option HSDPA/HSUPA modules
H2	9 Option HSDPA/HSUPA modules
C0	10 CMotech CDMA module
C1	11 Sierra Wireless CDMA module
C2	11 Sierra Wireless CDMA module
C3	10 CMotech CDMA module
C4	10 CMotech CDMA module
C6	10 CMotech CDMA module
C7	10 CMotech CDMA module
U0	9 Option HSDPA/HSUPA modules
U1	9 Option HSDPA/HSUPA modules
U2	13 Ericsson F3507g/F3607gw/F3307/F5521gw HSDPA module
U3	7 Sierra Wireless 3G module
U4	13 Ericsson F3507g/F3607gw/F3307/F5521gw HSDPA module
U5	17 Gobi UMTS or 18 Gobi CDMA
U6	13 Ericsson F3507g/F3607gw/F3307/F5521gw HSDPA module
U7	13 Ericsson F3507g/F3607gw/F3307/F5521gw HSDPA module
U8	17 Gobi UMTS

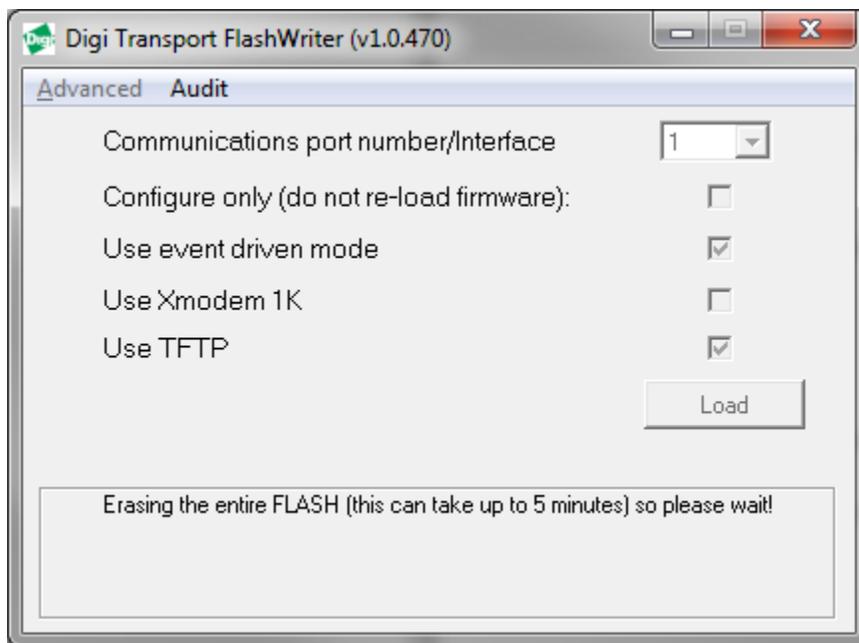
Once you click ok, the following message should appear:

How to test an WR44V1 step by step.



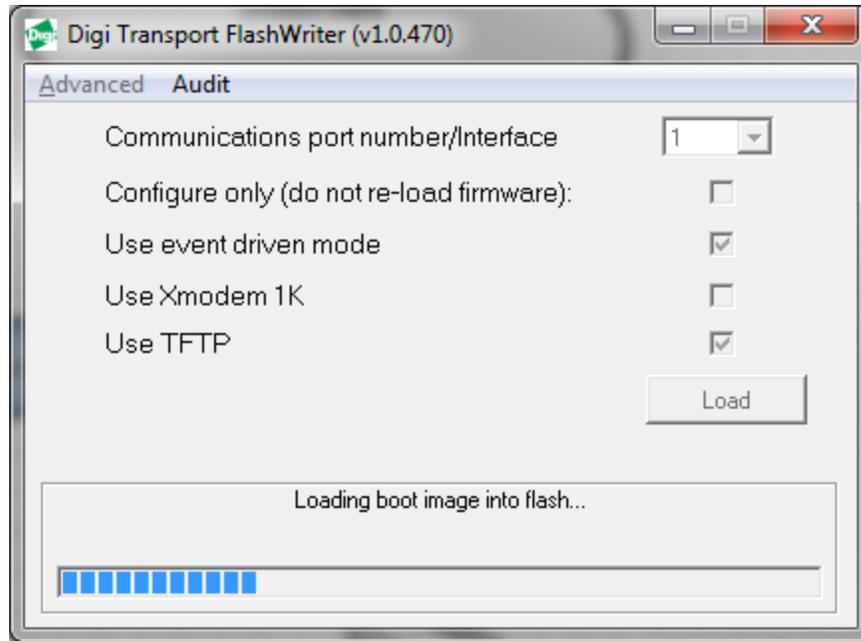
Click "OK", hold in the reset button (and keep it held) then plug in the power. This may take a bit of practise.

If you are successful then the following message will appear:



This step will take some time – please be patient. Once complete the boot image will be loaded into the flash:

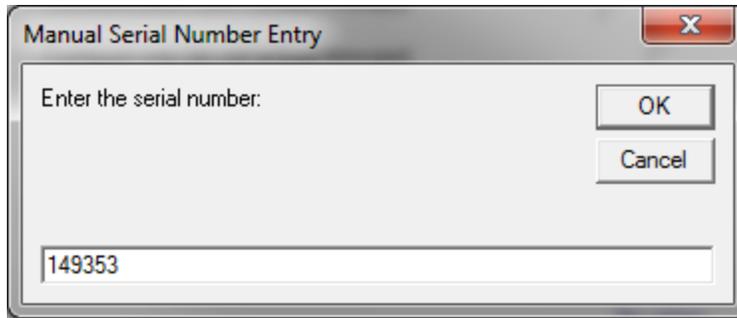
How to test an WR44V1 step by step.



Eventually you should be prompted to enter the 6 digit serial number. (Refer to the label under the WR44V1 to find the correct serial number.)

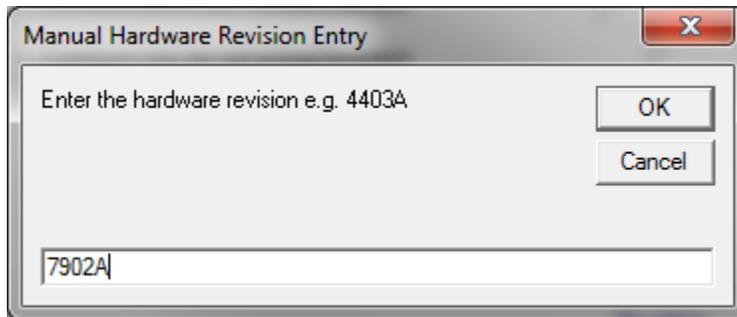


How to test an WR44V1 step by step.



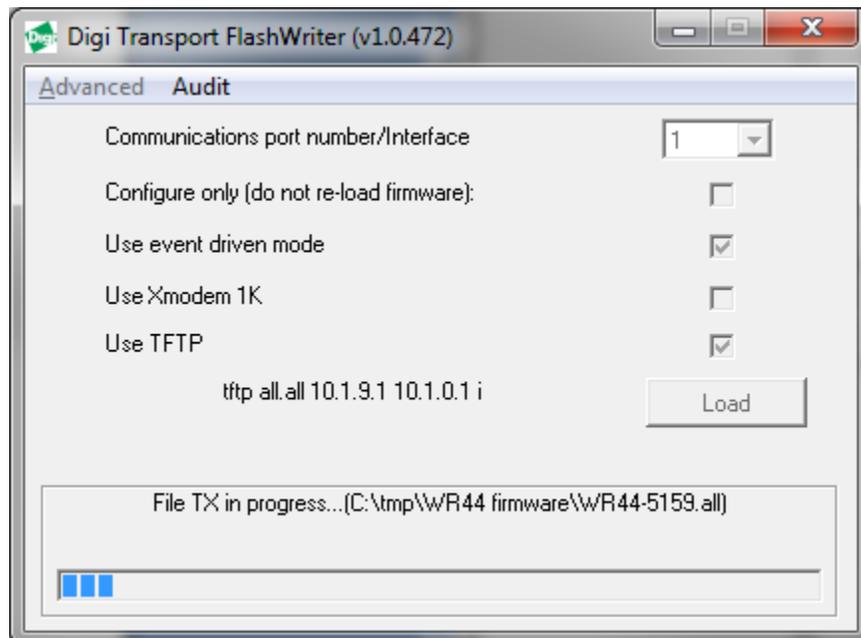
Click OK

Next enter the hardware revision:



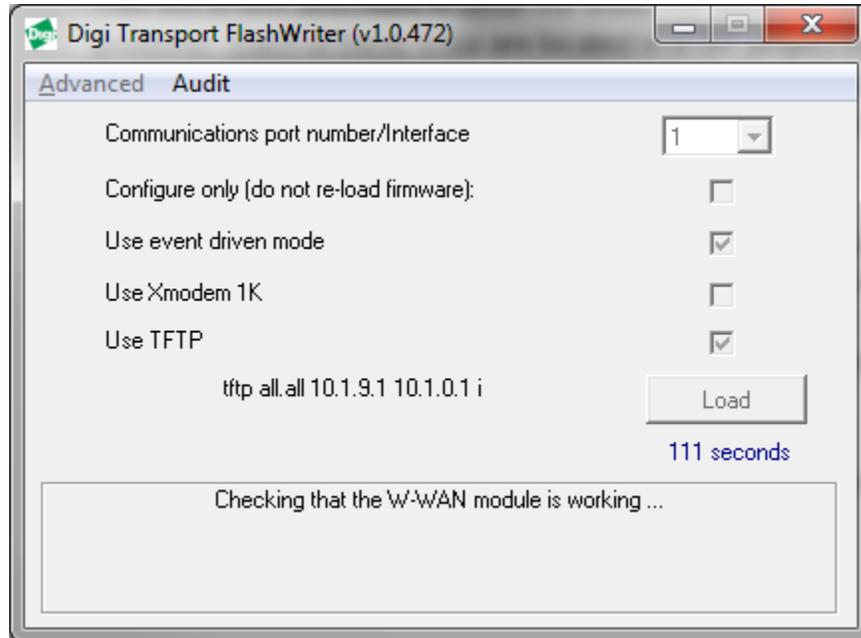
Click OK

The .ALL file should start to load:

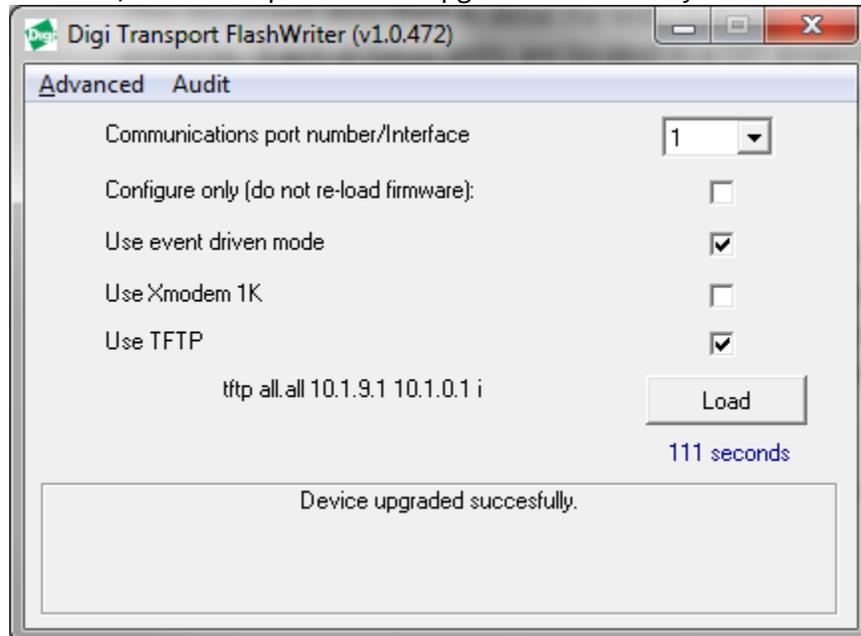


How to test an WR44V1 step by step.

After reboot, it should check the interface to the W-WAN module (if one is fitted):



After this and other tests, it should report "Device upgraded successfully":



This means the WR44V1 has been successfully flashed and correct communication with the internal radio module (if fitted) verified.

How to test an WR44V1 step by step.

At this stage the following hardware components (and more) have been successfully tested :

- FLASH
- SDRAM
- SRAM
- ETHERNET 0
- Serial port 0
- Interface to radio module (if fitted)

5.2 Reviewing Flashwriter error messages

If during the previous session an error occurred, please check the table below for the recommended course of action:

Error Message	Recommendation
Unable to establish contact with Tesla router.	This should not occur if the teslatest program was successful so suggests user error or bad PC serial port, please try this step again.
Error booting Tesla, '?' not received after sending '-'	This is very likely a hardware problem (as long as PC serial port is working correctly). Check again that this works on a known good router, if it does and it still fails with this error on the suspected bad router then request an RMA with error reason: "Tesla boot ? not received"
Error writing to flash: 'Did not receive correct response to F command'	This is very likely a hardware problem (as long as PC serial port is working correctly). Check again that this works on a known good router, if it does and it still fails with this error on a bad router then request an RMA with reason: "Tesla boot F command failure"
Confirmation that FLASH was erased not received.	This suggests a hardware problem (as long as PC serial port is working correctly). Check again that this works on a known good router, if it does and it still fails with this error on the suspected bad router then request an RMA with reason: "Tesla boot FLASH erase fail"
Failed to load: too many retries.	This could be an issue with the PC serial port, check again that this works on a known good router, if it does and it still fails with this error on a bad router then request an RMA with reason: Tesla boot "too many retries" error.
Problem writing to flash, '^ ^' response received (expected '* ').	This suggests a hardware problem. Check again that this works on a known good router, if it does and it still fails with this error on the suspected bad router then request an RMA with reason: "Tesla boot FLASH write fail"
Unable to start TFTP	Check that the Ethernet cable is connected correctly and the LAN LED is on. This error can often be "user error" or "network issues". However if this error is repeatable on the suspected bad router but does not occur on a known good router then request an RMA with reason. "Flashwriter TFTP failed to start"
Blue progress bar moves, but slowly and with lots of re-tries and eventually fails.	This suggests a hardware problem or a network issue on your LAN. Check again that this works on a known good router, if it does and it still fails with this error on the suspected bad router then request an RMA with reason. "Flashwriter TFTP failed to complete"
Unable to communicate with device after reboot	Check to see if the router is continuously rebooting. Please contact Digi technical support for help.
W-WAN module failed check - please check you selected the correct module!	Be very careful to check that you are selecting the correct radio module when you launch FlashWriter. This is the number one cause of this error! If you are unsure of the type of radio module fitted open the case. If you are sure you are selecting the correct radio module and if this error is repeatable on the suspected bad router yet works fine on a known good router, please request an RMA with reason: "Flashwriter radio check failed."

6 CHECK LEDS

Connect all four Ethernet ports to a switch.

Access the CLI (Command Line Interface) – this can be achieved:

- Through the serial port @115200 bps
- Via a telnet or SSH connection
- Via the “execute a command” page of the web user interface.

Issue the “flashleds” command and check that all LEDs are illuminated. If there is an LED fault please request an RMA with code:

“x LED failure” where x is:

- Power LED
- LAN 0
- LAN 1
- LAN2
- LAN3
- WLAN
- DTE
- NET
- SIM
- DAT
- Signal I
- Signal II
- Signal III

7 CHECK W-WAN CONNECTIVITY

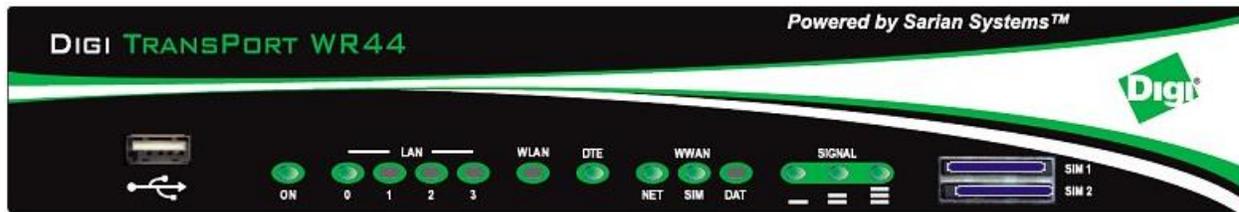
7.1 Test SIM detection switch

With the router powered off, insert a SIM card into BOTH SIM slots of the WR44V1.

Access the web user interface of the WR44V1.

Click the button to load the Java Applet front panel display.

Verify that both SIMs cards are shown as populated as in the picture below:



Note that the currently active SIM card will be flashing.

If the sim cards are physically inserted but do not appear in the applet please request an RMA with reason “**SIM DETECTION FAIL**”

7.2 Test SIM 1

Ensure that an antenna is connected and the router is located in an area with good signal strength.

Navigate to:

Configuration - Network > Interfaces > Advanced > PPP 1 > Mobile

Change **W-WAN SIM:** from “Any” to “**SIM 1**”



Click **Apply**.

How to test an WR44V1 step by step.

Next navigate to

Configuration - Network > Interfaces > Mobile

And select SIM **1**

▼ **Mobile**

Select a SIM to configure from the list below

Settings on this page apply to the selected SIM

SIM:

Under **“Mobile Settings”**

*Enter the correct APN for the SIM card installed in slot **1***

▼ **Mobile Settings**

Select the service plan and connection settings used in connecting to the mobile network.

Mobile Service Provider Settings

Service Plan / APN:

Click **Apply**.

How to test an WR44V1 step by step.

Navigate to:

Management - Connections > PPP Connections > PPP 1

Wait for up to 5 minutes and check for a valid IP address

You may need to refresh the page for the new address to appear (click on >PPP 1)

▼ **PPP 1 - W-WAN (HSPA 3G)**

Uptime: 0 Hrs 5 Mins 55 Seconds

Option	Local	Remote
MRU:	1500	1500
ACCM:	0x0	0x0
VJ Compression:	OFF	OFF

Link Active With Entity: ASY 2

IP Address: 10.22.3.153

DNS Server IP Address: 192.168.10.110

Secondary DNS Server IP Address: 194.51.3.56

Outgoing Call To: *98*1#

If a valid IP address is **NOT** found, please download the **debug.txt** and email this to Digi Technical Support (tech.support@digi.com) or open a case at <http://www.digi.com/support/eservice/> for assistance.

Instructions on how to extract the **debug.txt** can be found in the following application note: http://ftp1.digi.com/support/documentation/QN_024_Extracting%20the%20debug.txt%20file%20from%20a%20Digi%20TransPort%20or%20Sarian%20router.pdf

How to test an WR44V1 step by step.

7.3 Test SIM 2

Navigate to:

Configuration - Network > Interfaces > Advanced > PPP 1 > Mobile

Change “W-WAN SIM: from “SIM 1” to “SIM 2”

Use SIM Any SIM 1 SIM 2

Click **Apply**.

Next navigate to

Configuration - Network > Interfaces > Mobile

And select SIM 2

▼ **Mobile**

Select a SIM to configure from the list below

Settings on this page apply to the selected SIM

SIM: 2 (PPP 1) ▼

And under “**Mobile Settings**”

Enter the correct APN for the SIM card installed in slot 2

▼ **Mobile Settings**

Select the service plan and connection settings used in connecting to the mobile network.

Mobile Service Provider Settings

Service Plan / APN: You.APN.goes.here

Click **Apply**

How to test an WR44V1 step by step.

Now Navigate to:

Management - Connections > PPP Connections > PPP 1

Click “**Drop Link**” and refresh the page by clicking >PPP 1

You may need to wait up to 5 minutes

▼ **PPP 1 - W-WAN (HSPA 3G)**

Uptime: 0 Hrs 5 Mins 55 Seconds

Option	Local	Remote
MRU:	1500	1500
ACCM:	0x0	0x0
VJ Compression:	OFF	OFF

Link Active With Entity: ASY 2

IP Address: 10.22.3.153

DNS Server IP Address: 192.168.10.110

Secondary DNS Server IP Address: 194.51.3.56

Outgoing Call To: *98*1#

A valid IP address for SIM 2 should be seen – Notice it is different to the one assigned for SIM 1

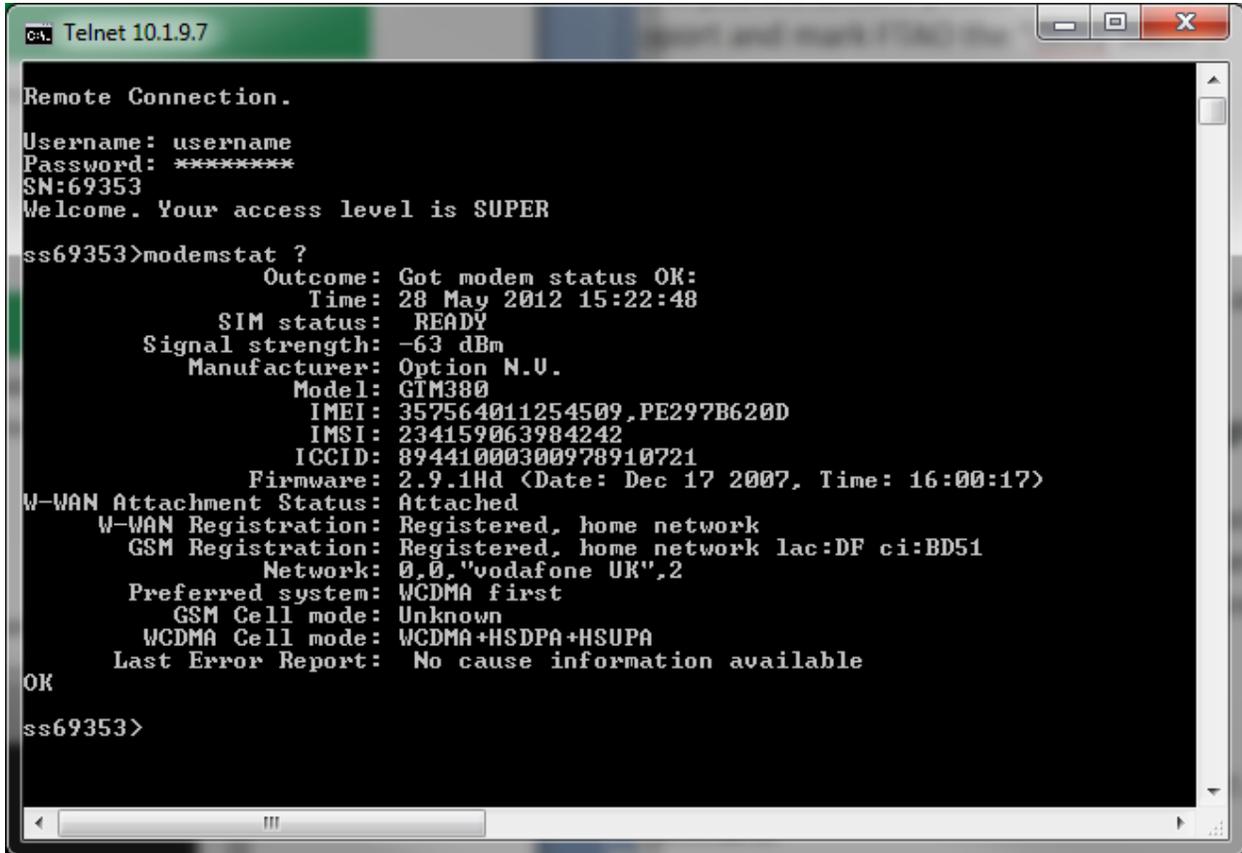
If a valid IP address is **NOT** found, please download the **debug.txt** and email this to Digi Technical Support (tech.support@digi.com) or open a case at <http://www.digi.com/support/eservice/> for assistance.

Instructions on how to extract the **debug.txt** can be found in the following application note:

http://ftp1.digi.com/support/documentation/QN_024_Extracting%20the%20debug.txt%20file%20from%20a%20Digi%20TransPort%20or%20Sarian%20router.pdf

8 CHECK W-WAN SIGNAL STRENGTH

Whilst the internet link is still connected from step 0, access the CLI (Command Line Interface) and issue the following command: “modemstat ?”



```
Telnet 10.19.7
Remote Connection.
Username: username
Password: *****
SN:69353
Welcome. Your access level is SUPER
ss69353>modemstat ?
      Outcome: Got modem status OK:
              Time: 28 May 2012 15:22:48
      SIM status: READY
      Signal strength: -63 dBm
      Manufacturer: Option N.U.
      Model: GTM380
      IMEI: 357564011254509,PE297B620D
      IMSI: 234159063984242
      ICCID: 89441000300978910721
      Firmware: 2.9.1Hd (Date: Dec 17 2007, Time: 16:00:17)
W-WAN Attachment Status: Attached
W-WAN Registration: Registered, home network
GSM Registration: Registered, home network lac:DF ci:BD51
                  Network: 0,0,"vodafone UK",2
Preferred system: WCDMA first
GSM Cell mode: Unknown
WCDMA Cell mode: WCDMA+HSDPA+HSUPA
Last Error Report: No cause information available
OK
ss69353>
```

Check that the signal strength is roughly what you normally get (+/- 10dB) with the same antenna in the test location.

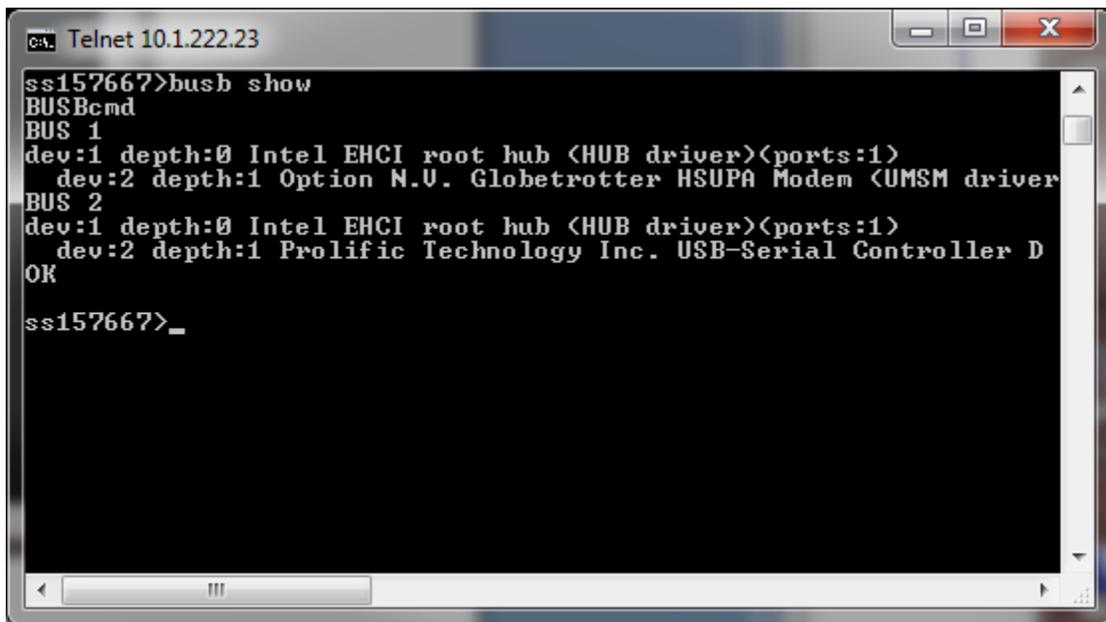
If the signal strength is much worse than normal, make a note of the cell ID (ci:BD51 in above example) and repeat the test on a known working WR44v1 that contains the same type of radio module in the same location. Ensure the known working WR44v1 is connected using the same antenna and connects to the same cell ID (ci:BD51 in above example). If it does and the signal strength is much better (+ 10dB) than the suspected bad router, request an RMA from Digi technical support with code: “Cellular signal strength low”

9 CHECK USB PORTS

Insert a valid USB device into the USB slots on the front of the WR44v1. A valid USB device is a device that you know works in a WR44v1 because you have tried it previously. Examples to try:

- USB Flash drive
- USB Serial adapter
- USB Mouse

Access the CLI (Command Line Interface) and issue the “bus show” command:



```
CA. Telnet 10.1.222.23
ss157667>bus show
BUScmd
BUS 1
dev:1 depth:0 Intel EHCI root hub <HUB driver><ports:1>
  dev:2 depth:1 Option N.U. Globetrotter HSUPA Modem <UMSM driver
BUS 2
dev:1 depth:0 Intel EHCI root hub <HUB driver><ports:1>
  dev:2 depth:1 Prolific Technology Inc. USB-Serial Controller D
OK
ss157667>_
```

2 devices should normally be present:

- Device in “BUS 1, dev2, depth 1” (This is an Option radio module, do not be concerned if it is missing, the module may be mid power cycle. The text of this will vary based upon the type of module fitted.)
- Device in “BUS 2, dev2, depth 1”

If the device in BUS 2, dev2, depth 1 is not present and this same devices shows up fine in a known working WR44v1, please request an RMA with code: “External USB port test failed”

10 CHECK ETH PORTS 1 TO 3

Note that it is not necessary to test Eth port 0, this was testing during the flashing process.

Access the CLI. Issue the ID command and check that the router is in “port isolate mode”:

```
Digi TransPort WR44-U000-WE1-XX Ser#:157667
Software Build Ver5159. Jun 26 2012 11:47:46 SW
ARM Bios Ver 6.74 v39 400MHz B512-M512-F80-O0,0 MAC:00042d0267e3
Async Driver Revision: 1.19 Int clk
Wi-Fi Revision: 2.0
IX Revision: 1.0
Ethernet Port Isolate Driver Revision: 1.11
Firewall Revision: 1.0
EventEdit Revision: 1.0
Timer Module Revision: 1.1
```

Configure eth ports 1 to 3 with a valid and free IP address on the same subnet as your test PC, e.g.

```
eth 1 ipaddr 192.168.1.51
eth 2 ipaddr 192.168.1.52
eth 3 ipaddr 192.168.1.53
```

From your PC, first clear the ARP table, from the windows command prompt and issue this command:

```
arp -d *
```

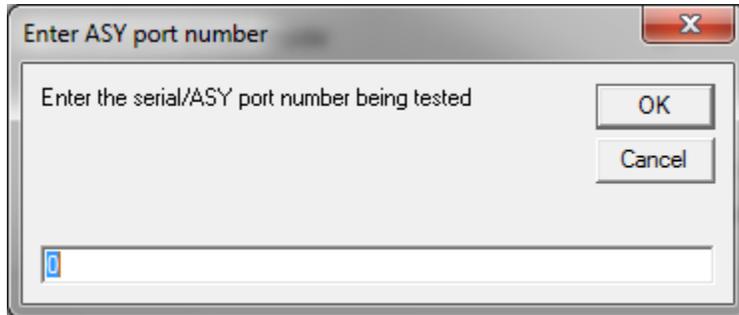
Then check that you can ping all three address.

If it is not possible to ping all three addresses and if you repeat this test on a known good WR44v1 and all three addresses respond to pings, please request an RMA with code “**ETH X test failed**” where X is the Eth port number that failed to respond.

11 CHECK SERIAL PORTS

With the PC serial port still connected to “Serial 0” of the WR44v1, launch Flashwriter again, ensure that the correct PC comm. port number is selected and click on “Check Serial” from the Advanced menu of FlashWriter.

When the following prompt is received:



As you are testing “Serial 0” just click OK.

If any error messages occur, please refer to the following table to identify the best course of action:

Error Message	Recommendation
Problem sending AT\LS	Flashwriter is unable to establish contact with the router under test. Please check the cabling and try again. If the problem persists then repeat the process with a known working router. If the test is successful on a known working router and the problem is repeatable on the router under test, please request an RMA with reason: “Flashwriter serial I/O test fail.”
Problem with DCD on (DCD was OFF when supposed to be ON)	First carefully check you are entering the correct serial/asy port number. If you get this wrong you will get a false fail! Next to verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter DCD test fail.”
Problem with DCD on (DCD was ON when supposed to be OFF)	First carefully check you are entering the correct serial/asy port number. If you get this wrong you will get a false fail! Next to verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter DCD test fail.”
Problem with DTR (DTR is off and should be ON)	To verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter DTR test fail.”
Problem with DTR (DTR is ON and should be OFF) on	To verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter DTR test fail.”
Problem with CTS (CTS is ON and should be OFF) on	To verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter CTS

How to test an WR44V1 step by step.

	test fail.”
Problem with CTS (CTS is OFF and should be ON) on	To verify cabling, please repeat this procedure on a known working router. If the test is successful on a known working router but repeatedly fails on the router under test then please request an RMA with reason: “Flashwriter CTS test fail.”