Test a WR41v1 Router

How to test a WR41v1 router step by step.

Technical Support
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Contents

1 INTRODUCTION

1.1 Outline

This guide will enable a competent technician to test the hardware of a WR41V1 router.

NOTE: The WR41V1 router may also be referred to as WR41.

If the tests in sections 4 – 10 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 WR41. (E.g. GPS, serial, PSTN, ISDN, Telemetry etc.). If a daughter card is fitted please request additional testing steps from tech.support@digi.com.

This note applies only to a WR41V1

1.3 Corrections

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

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

1.4 Version

| Version Number	Status
0.6	Draft
1.0	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 WR41V1.
3. An Ethernet switch/hub to connect the PC to the WR41V1 (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 WR41V1 and PC to the Ethernet switch.
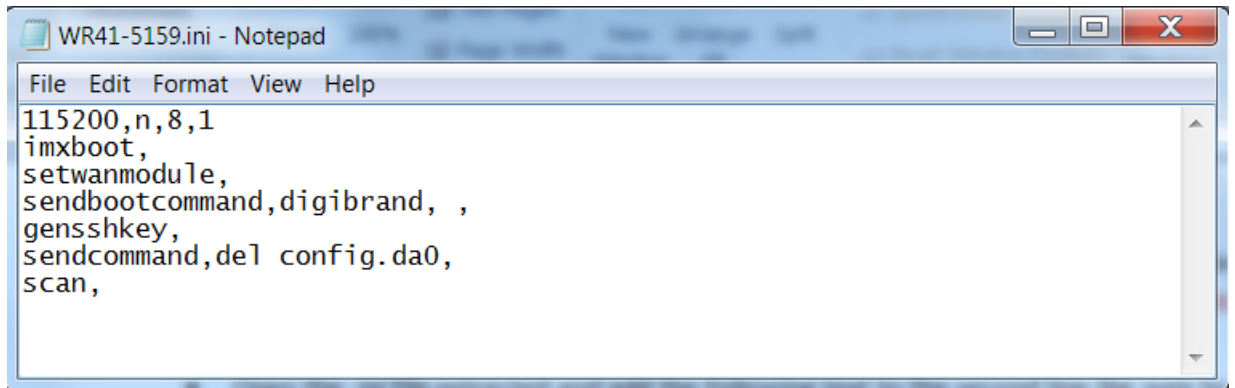5. A pen or paper clip which can easily de-press the WR41V1's reset button

3   SET UP THE TEST EQUIPMENT

Set up the test equipment as described below.

- Connect LAN 0 of the WR41V1 to the switch/hub.
- Connect "ASY 0" the WR41V1 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 WR41V1 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 WR41V1 to your normal office LAN.
- Locate a suitable implement to depress the reset button when required.
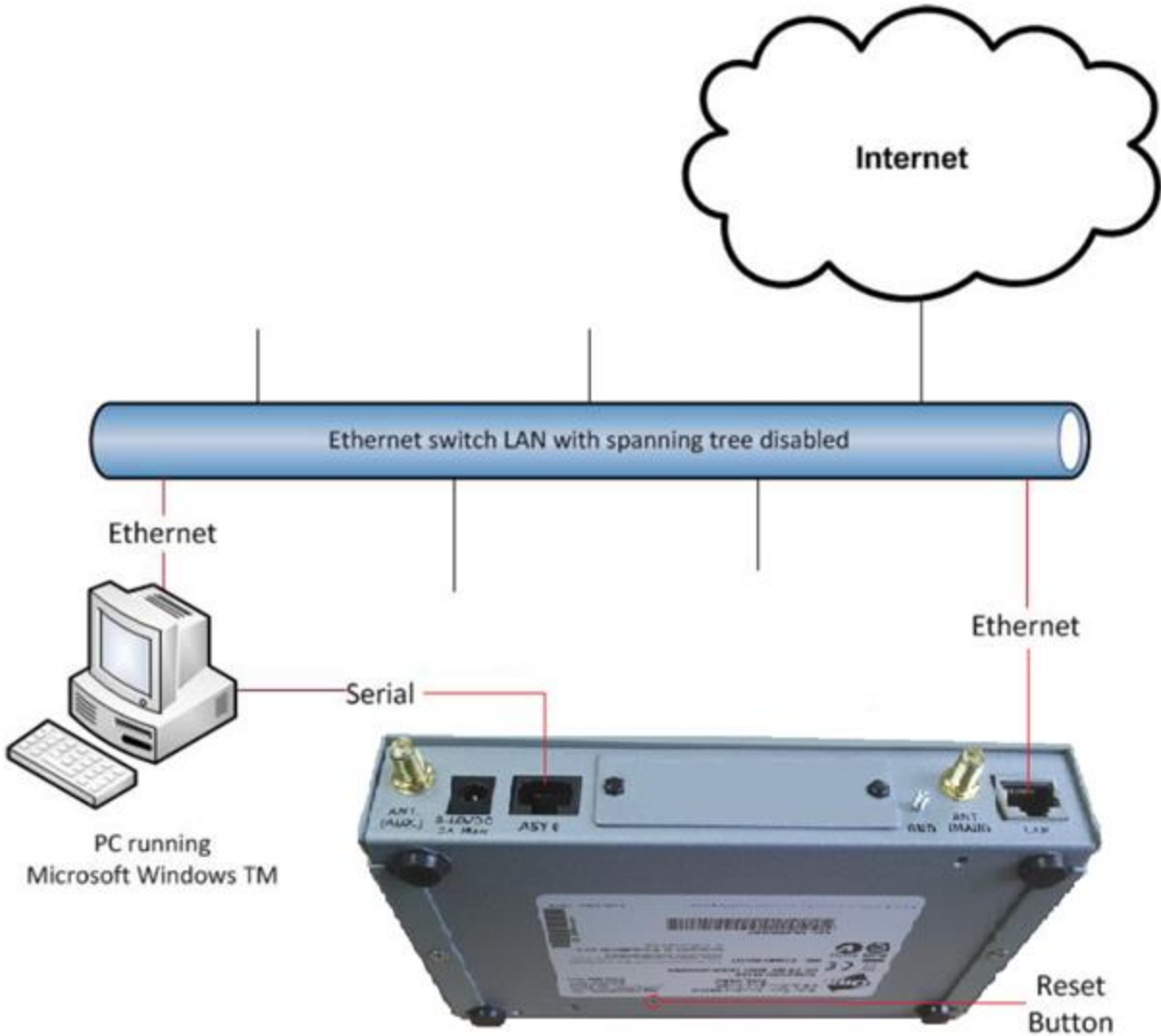
- Next download the following file: http://transport.digi.com/downloads/imxtest.zip
- Extract the contents of the zip file to a folder in the root directory of the test PC.
- Download the latest WR41V1 Flashwriter zip file and extract the contents to a single folder on your PC: http://transport.digi.com/digi/firmware/flashwriter/XXXX/WR41/WR41-XXXX.zip 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):
  imxboot,

```
WR41-5159.ini - Notepad
File  Edit  Format  View  Help
115200,n,8,1
imxboot,
setwanmodule,
sendbootcommand,digibrand, ,
gensshkey,
sendcommand,del config.da0,
scan,
```

- 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 WR41V1 using the serial cable.

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

imxtest -p 1

(E.g. for COM port 1)

imxtest -p 2

(E.g. for COM port 2)

Hold the reset button in and then power up the WR41V1. This may take a little practise.

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


```
Administrator: cmd.exe - Shortcut
C:\Windows\System32>cd c:\imxtest

c:\imxtest>imxtest p 1
*** Warning! The contents of the FLASH will be erased. ***
Testing SDRAM... passed
Testing FLASH... passed
Testing SRAM... passed

c:\imxtest>
```

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:

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 WR41V1 without issue.

5.1   Using Flashwriter

Launch Flashwriter from the start menu. Select the communications port number (PC comm. port number) to which the WR41V1 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):
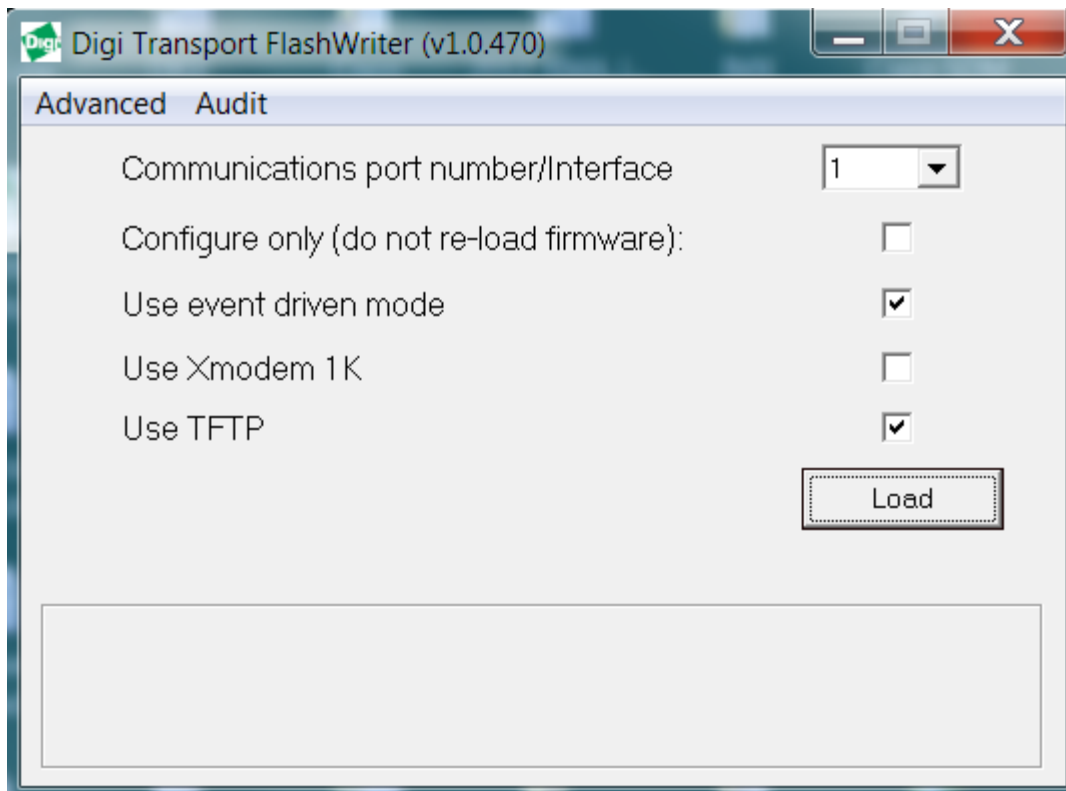
If your PC has more than one network adapter, be sure to select the one that represents the connection to LAN illustrated in section 3. If your PC only has a single network adapter this screen will not appear:
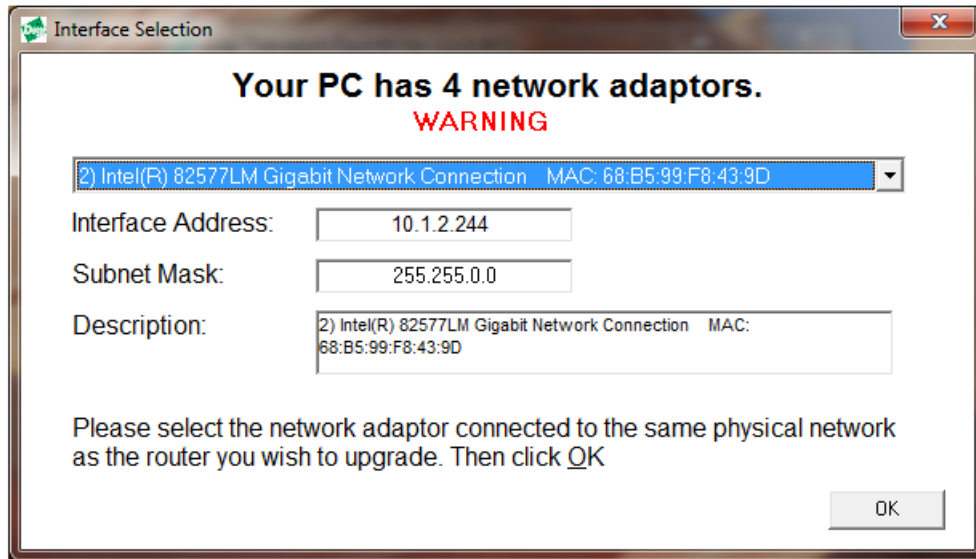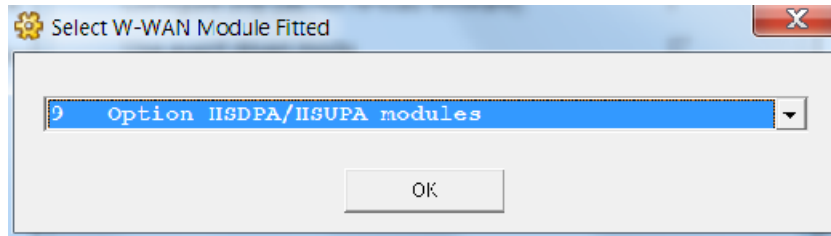
In the file dialogue, select the "ALL" file you extracted from the ZIP earlier:
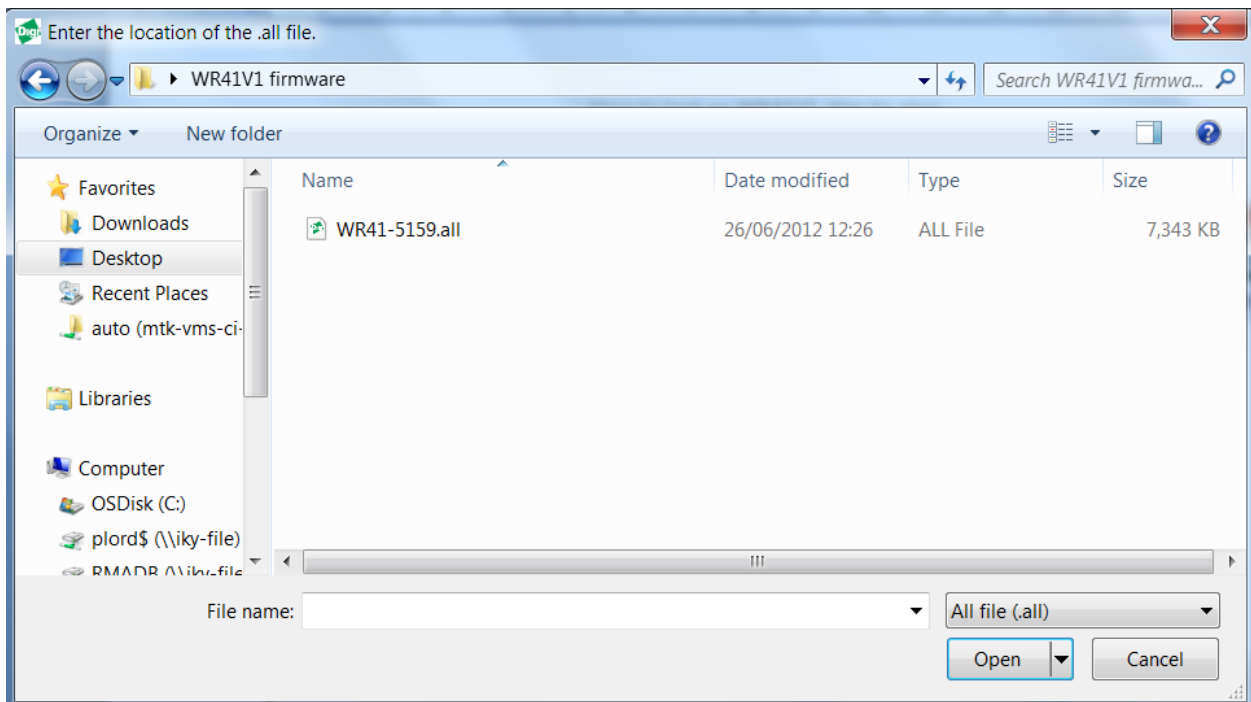
And click "Open".

The following message will appear:

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 "U0":

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:

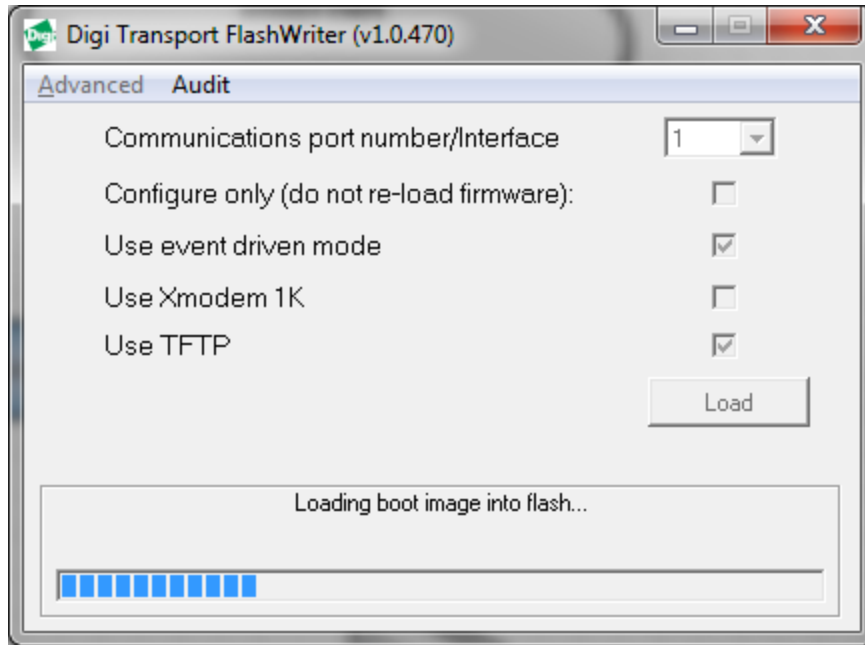Click "OK", hold in the reset button (and keep it held) then plug in the power. This may take a bit of practise.

If you are successful then the following message will appear:
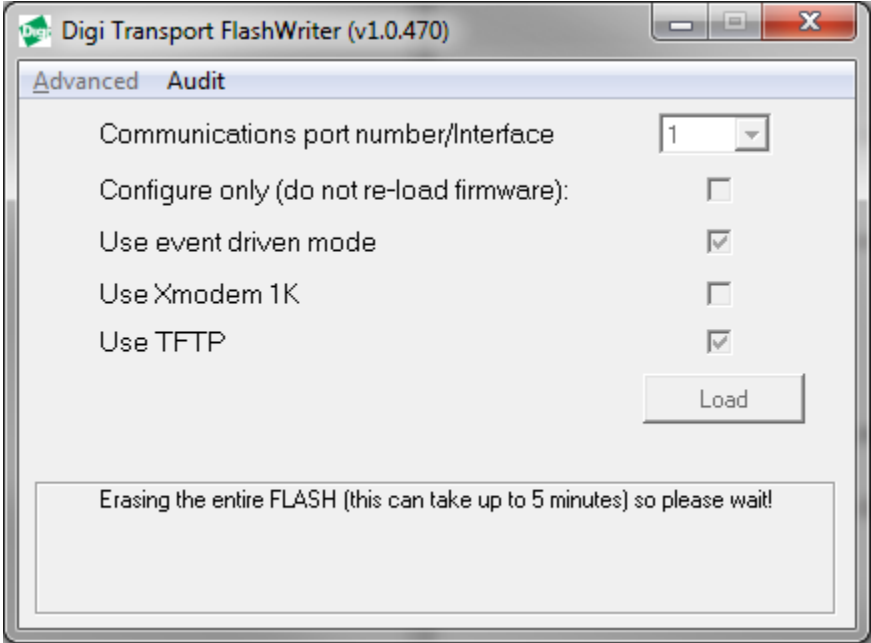
This step will take some time – please be patient. Once complete the boot image will be loaded into the flash:

Eventually you should be prompted to enter the 6 digit serial number. (Refer to the label under the WR41V1 to find the correct serial number.)
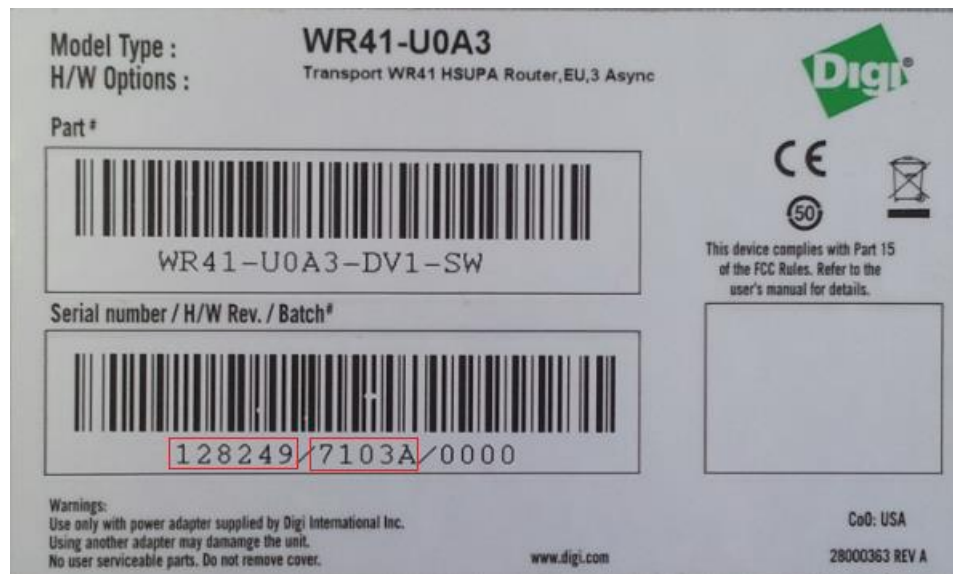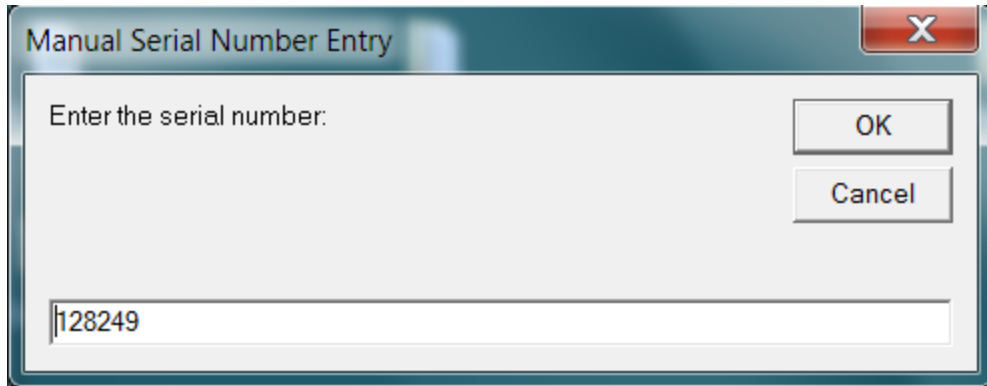
Click OK

Next enter the hardware revision:

Click OK

The .ALL file should start to load:

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 WR41V1 has been successfully flashed and correct communication with the internal radio module (if fitted) verified.

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

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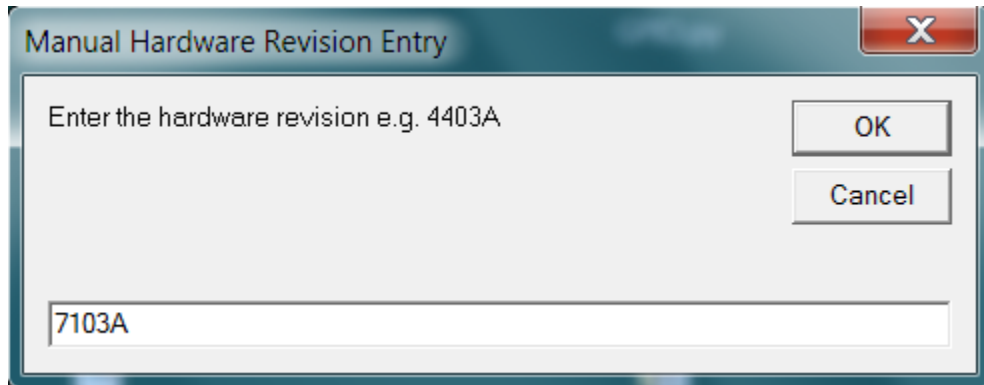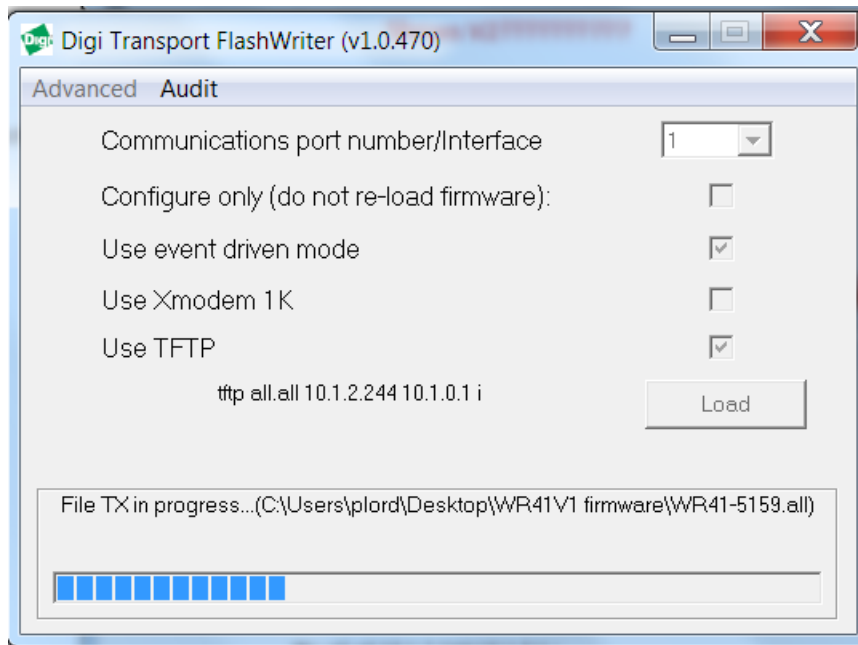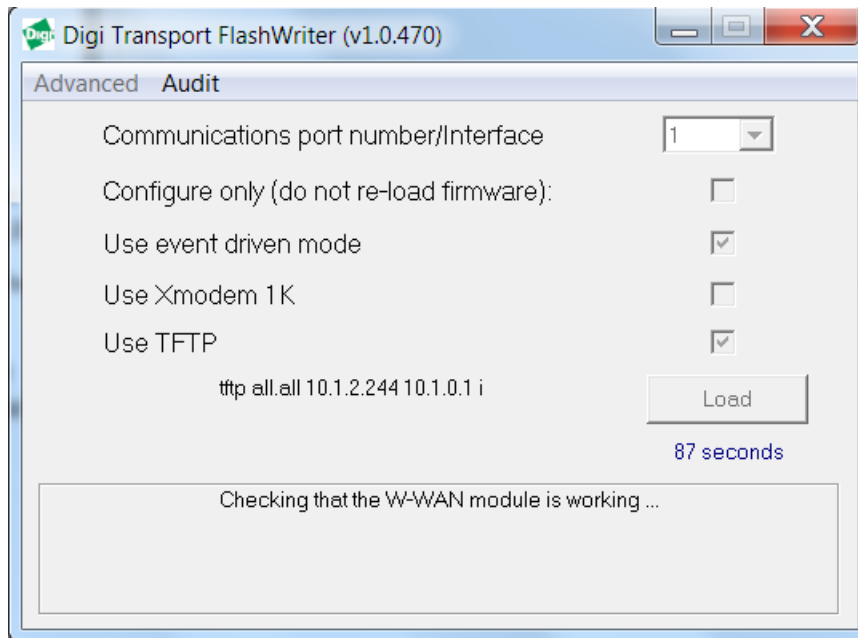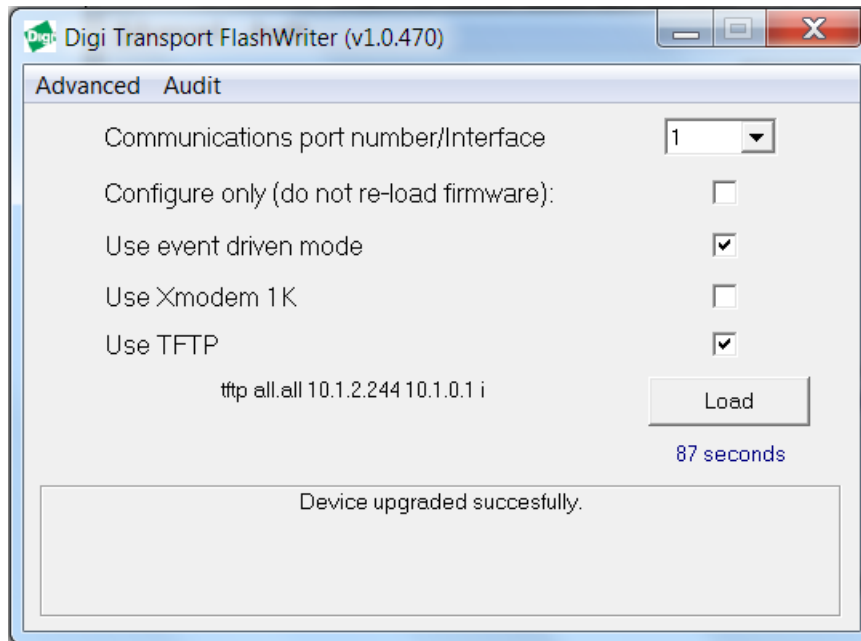- SRAM
- ETHERNET 0
- Interface to radio module (if fitted)

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 IMX CPU.	This should not occur if the teslatest program was successful so suggests user error or bad PC serial port, please try this step again.
Correct response not received to download 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 the suspected bad router then request an RMA with error reason: "Correct response not received to download command"
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 of boot code 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: "Confirmation of boot code not received."
Error booting imx, '? not received after sending -'.	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: Error booting imx, '? not received after sending -'
Error writing to flash: 'Did not receive correct response to F command'	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: "Error writing to flash: 'Did not receive correct response to F command'"
Confirmation that FLASH was erased not received.	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: "Confirmation that FLASH was erased not received"
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: Failed to load: too many retries.
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: "Problem writing to flash, ' ^ ' response received (expected ' * ')."
Problem writing to flash, invalid response received XXXX(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: "Problem writing to flash, invalid response received XXXX(expected ' * ').
Unable to obtain boot-loader control, do you wish to try again?	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 "Unable to obtain boot-loader control after successful IMX boot."
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 the Ethernet port 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:

- ON LED
- LAN
- W/N
- NET
- SIM
- DAT
- Signal I
- Signal II
- Signal III
- DTE

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 WR41V1.

Access the web user interface of the WR41V1.

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***"**

Use SIM ◯ Any   ⦿ SIM 1   ◯ SIM 2

Click Apply.

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: 1 (PPP 1) ∨

And 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: You.APN.goes.here

Click Apply.

Now 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)

If a valid IP address is **NOT** found, please download debug.txt and email this to Digi technical support for assistance.

7.3   Test SIM 2

Navigate to:

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

Change *"***W-WAN SIM***: from "***SIM 1***" to "***SIM 2***"*

Click Apply.

Next navigate to

Configuration - Network > Interfaces > Mobile

And select SIM 2

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

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)
Raise Link   Drop Link

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 debug.txt and email this to Digi technical support for assistance.

8   CHECK W-WAN SIGNAL STRENGTH

Whilst the internet link is still connected from step 7, access the CLI (Command Line Interface) and issue the following command: "modemstat ?"

```
Telnet 10.1.208.1                                    _ □ X
SN:128249
Welcome. Your access level is SUPER

ss128249>modemstat ?
                Outcome: Got modem status OK:
                   Time: 3 Aug 2012 09:30:58
             SIM status:  READY
        Signal strength: -67 dBm
           Manufacturer: Option N.V.
                  Model: GTM380
                   IMEI: 357564013717602
                   IMSI: 234159087893245
                  ICCID: 89441000300678785654
               Firmware: 2.12.0Hd (Date: May 27 2008, Time: 11:19:10)
 GPRS Attachment Status: Attached
      GPRS 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:  Requested service option not subscribed
OK

ss128249>
```

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 WR41V1 that contains the same type of radio module in the same location. Ensure the known working WR41V1 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 slot on the front of the WR41V1. A valid USB device is a device that you know works in a WR41V1 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 "busb show" command:

2 devices should normally be present:

- Device in "BUS 1, dev2, depth 1" (A USB stick is present in this example)
- Device in "BUS 2, 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.)


If the device in BUS 1, dev2, depth 1 is not present and this same devices shows up fine in a known working WR41V1,please request an RMA with code: "External USB port test failed"

10 CHECK SERIAL PORTS

With the PC serial port still connected to "Serial 0" of the WR41V1, 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:
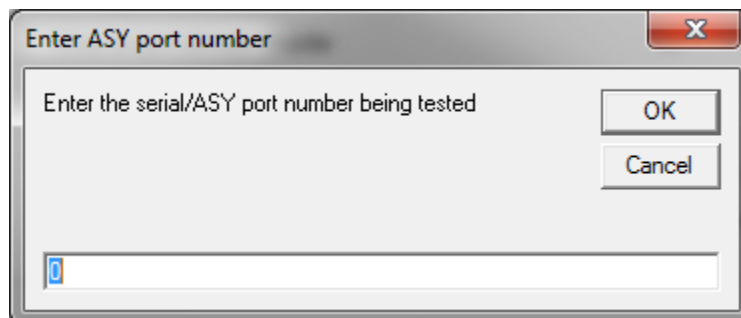
As you are testing "Serial 0" just click OK.

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 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."