



Application Guide

Using FlashWriter.

Digi Support
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1 INTRODUCTION

1.1 Introduction

FlashWriter is a fast and efficient tool designed to load TransPort routers with firmware and configurations. It operates on the principle of a master configuration which is stored in a “.all” file. The .all file contains everything needed install the correct firmware and configuration files onto a unit.

Users can create their own .all files from a “golden” unit or they can use a generic TransPort supplied .all file.

FlashWriter can (optionally) pause during the upload process and prompt the user to enter parameters which deviate from the golden configuration e.g. site name or a specific IP address.

The parameters to be set by the user at runtime are chosen by making entries in an ini file

For bulk installations, FlashWriter can read site specific parameters automatically from a Microsoft Access database.

FlashWriter can be downloaded from the Digi Support Web site:

<http://ftp1.digi.com/support/utilities/FlashWriter.htm>

1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product and of the requirements for their specific application. It also assumes a basic ability to access and navigate a Digi TransPort router.

It is very important that the correct firmware file is used for the model number being upgraded. If you attempt to load firmware designed for one model onto a different model the router may cease to function and will be difficult to recover

This application note applies only to:

Model: Digi DR64, VC74 and TransPort Routers **WR11***, WR21, WR41, WR44,.

***Please note:** For the Digi TransPort WR11, please use the Ethernet/TFTP Process only.

Please note: Please contact tech.support@digi.com if your require assistance in upgrading the firmware of the Sarian or TransPort router.

1.3 Corrections

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

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

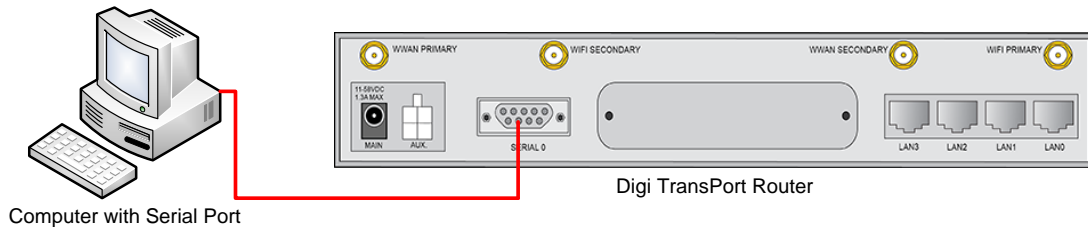
2 VERSION

Version Number	Status
1.0	Published

3 EQUIPMENT SETUP

3.1 Serial Connection

For Digi DR64, VC74, TransPort WR21, WR41, WR44 Routers.

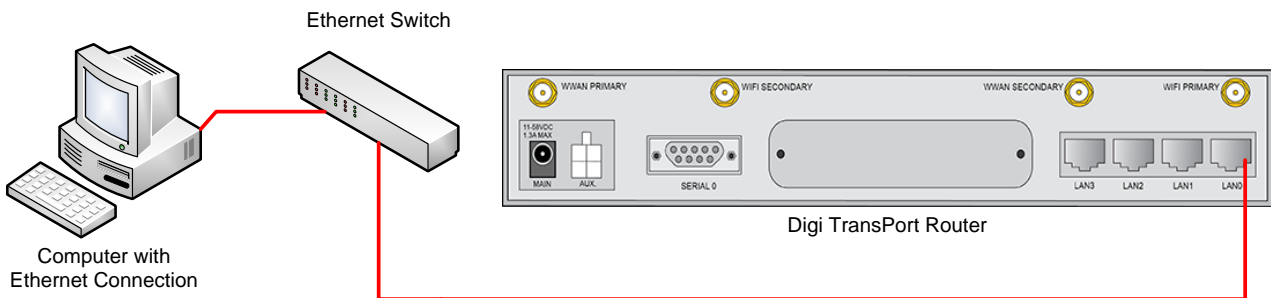


Connect the ASY 0 or Serial 0 port of the Digi TransPort router to the Serial Port of the computer. The serial cable used should be straight thru. Please refer to the following document for serial ports pinouts: http://ftp1.digi.com/support/documentation/Transport_Serial_Pinouts_rev_3.pdf

3.2 Ethernet Connection

Digi DR64, VC74, TransPort WR11, WR21, WR41, WR44 Routers.

Please Note: Make sure to use an Ethernet Switch between the computer and the Digi TransPort router. A warning message will be shown with this information during the process when using "Eth" as the communication port.

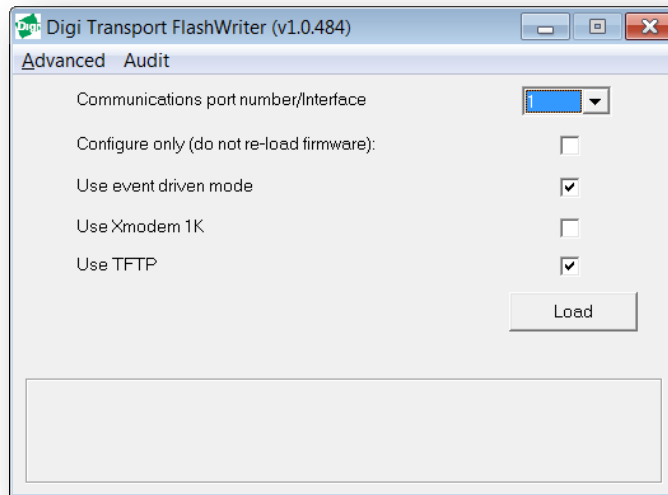


4 USING FLASHWRITER

4.1 Configure FlashWriter

Connect a serial port on your PC to the appropriate port on the TransPort unit using an RS232 compatible cable. (The appropriate TransPort port is determined by the configuration to be loaded.) Please see section 7 for Ethernet configuration.

Launch the FlashWriter program. You will see the following dialogue box:



Select the communications port number (on your PC) that you connected the RS232 cable to.

Ensure that none of the check boxes are ticked (these are for advanced users only).

Click load and follow the instructions. **To avoid conflicts with other programs, do not use your PC for anything else whilst FlashWriter is running!**

Please Note: If the TransPort unit already has the correct firmware, clicking the Configure Only check box will cause FlashWriter to skip prompting the user for the parameter values. (Thus avoiding a delay whilst the unit is loaded with firmware). This option should be used with great care.

5 PREPARING FLASHWRITER

To prepare FlashWriter, an entire flash image should be created using the boot-loader command: "upload all".

The image should contain the correct version of firmware and a default configuration without any site specific settings e.g. "cmd 0 unitid". See section 6.0 for instructions on how to use FlashWriter to extract an ALL file.

The image file should be renamed to <somename>.all i.e. it should have the three-character filename extension "all".

If no parameters are to be set by the end user then it is not necessary to create an ini file. If site-specific settings are to be entered by the user then an ini file that has the same name as the ".all" file should be created i.e. <somename>.ini.

This ini file should be located in the same directory as the .all file at runtime.

6 INI FILE CONFIGURATION

6.1 ini File format and parameters

The first line of the ini file must contain the baud rate to which the programmed unit will boot to. This is dependent upon the ASY port that the FlashWriter PC is connected to and the configuration of the ASY port. It is therefore important that the end user is instructed to connect his/her PC to the appropriate ASY port on the TransPort unit.

Line 1 is required in every ini file:

```
<baud rate>,<parity>,<data bits>,<stop bits>
```

The following entry can be optionally included as line 2:

```
preloadsbios,
```

When included FlashWriter will load in a bootloader with the same name as the ini file but with extension “.sbios” instead of “.ini” before loading the main “.all” file. One application where this is useful is when the bootloader currently on the TransPort can only access 1MB of flash but the “.all” file contains a bootloader that can access 2MB of flash.

Further ini file lines are optional and are used to prompt the user for the value of parameters. Currently there are 4 methods of prompting a user for a parameter value:

- Free text
- Combo box selection
- IIN range entry dialog box
- Multi instance parameter inputs

There are also four parameters which control the way FlashWriter operates:

- numeric
- scan
- time
- fattr

Each parameter to set requires a separate line in the ini file.

6.2 Free text input field

The format of a free text entry is as follows:

```
textInput,<SarOS command>,<user prompt>
```

Example:

```
textInput,cmd 0 unitid,Enter unit identification:
```


6.3 Combo box selection

The format of a combo box entry is as follows:

```
comboInput,<SarOS command>,<user prompt>,(<combo selection n  
text>,<combo selection n parameter value>)*n
```

Example:

```
comboInput,eda 1 hc_on,Is a hot card box connected to ASY port  
0?,Yes,ON,No,OFF,
```

Please Note: The above entry should be on **one line only** of the ini file and **must end with a comma**.

6.4 IIN range entry dialog box

The IIN range entry dialog box will allow the user to enter as many card ranges as is permitted by the ini file entry. The ini file entry should contain the lowest authmap number available and the highest authmap number available for the current build and configuration. I.e. normally both these authmap numbers and all the numbers in between will be blank in the configuration present in the .all file.

```
IINRange,<lowest authmap number>,<highest authmap number>,  
IINRange,75,83,
```

6.5 Multi instance parameter inputs

The format of a multi instance parameter entry is as follows:

```
multiInstance,<protocol entity>,<parameter>,<instance bitmask>,<user  
prompt>
```

The bit mask should be set to 1 for each protocol instance to be programmed. For example, to program protocol instances 1 and 3 set <instance bitmask> to 9. (i.e. 9 = 1001 in binary)

Example:

```
multiInstance,tpad,cingnua,3,Please enter calling NUA
```

6.6 Numeric response codes

The format of a numeric response code entry is as follows:

```
numeric,
```

The above entry in the ini file will cause FlashWriter to expect the TransPort to be configured for numeric (rather than verbose) response codes when the unit reboots after loading.

6.7 Time

The format of a time entry is as follows:

```
time, or time<n>
```

The “time,” entry will cause FlashWriter to check that the TransPort unit’s time is within 2 seconds of the PC’s time when the unit has rebooted after loading. As the time is always set before loading an “ALL” file this checks that the RTC is functioning correctly.

The optional parameter n allows the user to specify the tolerance to check the time to. For example the entry “time3,” will cause FlashWriter to check that the TransPort unit’s time is within 3 seconds of the PC’s time.

6.8 Scan

The format of a scan entry is as follows:

```
scan,
```

The above entry in the ini file will cause FlashWriter to scan the flash for bad CRCs when the unit has finished loading.

6.9 Fattr

The format of a fattr entry is as follows:

```
fattr,
```

The above entry in the ini file will cause FlashWriter to treat the config.da0 file as read-only. Before saving any changes FlashWriter will mark the file as read-write. After saving any changes FlashWriter will mark the file as read-only again.

7 SITE-SPECIFIC PARAMETERS FROM ACCESS DATABASE

This option allows FlashWriter to read various site-specific parameters from an Access database with the same filename as the “ALL” file but with an “.mdb” extension. The Access database needs to contain a table named “**TBLFlashData**”. The first column in this table must contain the serial number of the units to be programmed without the leading zeros and the column title must be “**serialNum**”.

For each comma-separated entry in this line of the ini file, FlashWriter will take the parameter value from the Access database record with the same serial number as the unit under test starting at the second column in the Access database. Each entry in this line of the ini file must be the TransPort command used to program in the parameter. For example to set the Ethernet 0 IP address the following command would be entered at the TransPort CLI (command line):

```
eth 0 ipaddr 192.168.0.99<CR>
```

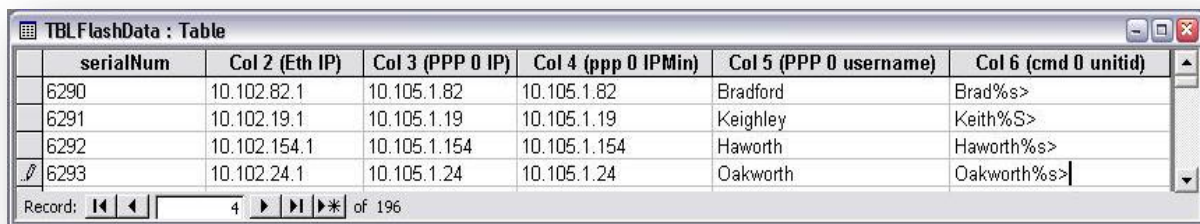
So the ini file needs to contain “**eth 0 ipaddr,**”

The following ini file entry will cause 5 site-specific parameters to be programmed:

```
databaseparam,eth 0 ipaddr,ppp 0 ipaddr,ppp 0 ipmin,ppp 0 username,cmd  
0 unitid,
```

n.b. the last entry on a databaseparam ini file entry MUST end with a comma.

The access database table to “go with” this entry must therefore contain 6 columns. The first column containing the serial number of the unit, the second column the Ethernet IP address etc. The name of column 1 must be “**serialNum**”, the names of columns 2-6 are not important.



serialNum	Col 2 (Eth IP)	Col 3 (PPP 0 IP)	Col 4 (ppp 0 IPMin)	Col 5 (PPP 0 username)	Col 6 (cmd 0 unitid)
6290	10.102.82.1	10.105.1.82	10.105.1.82	Bradford	Brad%s>
6291	10.102.19.1	10.105.1.19	10.105.1.19	Keighley	Keith%S>
6292	10.102.154.1	10.105.1.154	10.105.1.154	Haworth	Haworth%s>
6293	10.102.24.1	10.105.1.24	10.105.1.24	Oakworth	Oakworth%s>

8 EXAMPLE INI FILE

The following is an example of a correctly configured ini file.

```
115200,n,8,1
preloadsbios,
textInput,cmd 0 unitid,Enter unit identification:
textInput,eda 1 termid,Enter the Terminal ID:
textInput,eda 1 merchnum,Enter the Merchant Number:
comboInput,eda 1 hc_on,Is a hot card box connected to ASY port
0?,Yes,ON,No,OFF,
IINRange,75,83,
scan,
time3,
```

9 TFTP OPERATION

TFTP (Trivial File Transfer Protocol) allows Digi TransPort routers to be loaded via the Ethernet port instead of serial port. This dramatically reduces the time taken to load a unit with firmware. Note that FlashWriter still requires a serial port connection in order to send commands to the TransPort unit.

Select ETH for the Communications port number/interface

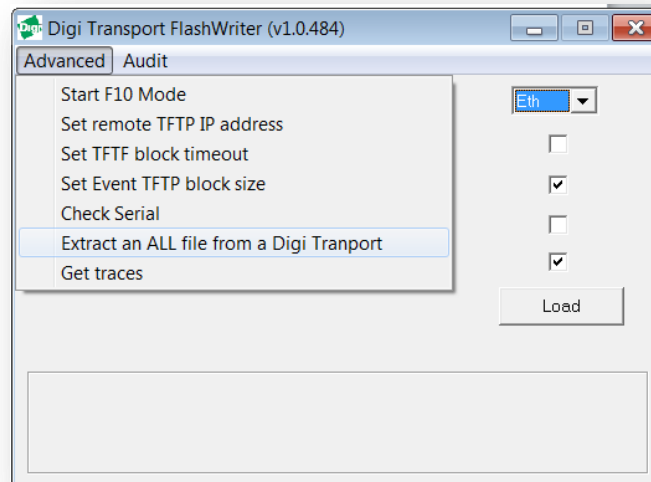
To use TFTP mode, press F12 and enter a free IP address on your subnet. This IP address will be assigned to the TransPort unit during load. Ensure that the options "Use TFTP" and "Use event driven mode" are checked. Check that the TransPort unit to be programmed and the PC running FlashWriter are both connected to the same Ethernet network. Also ensure that the nominated serial port on the TransPort is connected to the PC as normal. When the above steps are complete click on the "Load" button and proceed as normal.

Please Note: When FlashWriter has been launched with command line parameters specifying communications port numbers FlashWriter will change the numbers after the last "dot" in the IP address to ensure that each TransPort unit is assigned a unique IP address. This is intended to allow several units to be programmed simultaneously by the same PC. This means that the PC running FlashWriter must be configured to use a CLASS A or CLASS B like subnet. E.g. 255.255.0.0 and not 255.255.255.0.

Please Note: Ethernet mode only works with an Ethernet Switch between the computer and the Digi TransPort router. A warning message will be shown with this information before the process is started.

10 EXTRACTING AN “ALL” FILE

FlashWriter allows end users to extract their own flash image (or ALL file) from their TransPort unit via serial port. To achieve this connect your TransPort to the PC via an RS232 compatible serial cable or through Ethernet port, select the correct communications port number or Eth on the main screen and then from the Advanced menu select “Extract an ALL file from a Digi Transport”. Enter a file name to save the file to and follow the instructions that FlashWriter provides.



11 FURTHER NOTES

- If no ini file is present, when the TransPort unit has been programmed, FlashWriter will reboot the unit and report that it is “ready for use after reboot.”
- When an ini file is present but only the first line of the ini file contains data (i.e. the baud rate). When the unit has been programmed FlashWriter will reboot the unit and wait for the unit to reboot before reporting that it is ready for use. It is important that the baud rate setting is correct for the ASY port which is used to program the unit because FlashWriter will confirm that the unit has successfully rebooted by sending an “AT” and waiting for “OK”.
- FlashWriter should work fine if the ASY port is set to auto-baud because an “AT\LS” command is always issued prior to programming parameters. It is recommended that the following first line of the ini files is used for auto-baud: “115200,n,8,1”.
- Whenever a flash image is loaded, FlashWriter ensures that the main image is used by issuing an inum 0 command. FlashWriter also programs the TransPort unit with the current time according to the PC operating system.
- Pressing F7 will allow the user to specify the process and thread priority.
- Pressing F10 will put FlashWriter into a continuous loop where it loads on the last “.all” it loaded without prompting the user. In F10 mode FlashWriter will change color to indicate success or failure.
- FlashWriter can be launched with the following command line parameters:
 - <comm. port number> <x co-ordinate> (y co-ordinate) [A]
 - Where:
 - <comm. port number> = The Windows comm. port to select.
 - <x co-ordinate> = The X co-ordinate of the FlashWriter Window
 - <y co-ordinate> = The Y co-ordinate of the FlashWriter Window
 - A (Which is optional) = Launch FlashWriter in F10 mode.
 - Example “.bat” file:

```
FlashWriter 3 1 1 A
FlashWriter 4 6360 1 A
FlashWriter 5 12720 1 A
FlashWriter 6 1 4335 A
FlashWriter 7 6360 4335 A
FlashWriter 8 12720 4335 A
FlashWriter 9 1 8670 A
FlashWriter 10 6360 8670 A
exit
```