SF2
Boot Loader and Serial Interface Instructions

Review Record

Version	Date	Author	Comment
0.1	23/7/2017	Neville Rowe	Initial Version

Introduction

This document explains how to update the firmware on an SF2 and how to use the serial terminal interface to get debugging information off the SF2.

Warning

If there are issues with updating the firmware it is possible to permanently stop the SF2 from working. Follow all the steps precisely.

PreRequisites

You should have the following before starting

1) An SF2
2) A Windows PC with a USB port and the SSD Bootloader application installed. Note the Bootloader application needs administrator privileges to run.
3) A USB Firmware update cable
4) The new firmware file you want to apply (a .zip file)
5) An FTDI cable for the serial interface
6) A terminal application on the PC setup to connect at 115,200 baud, 8 data bits, no parity, one stop bits and no flow control.

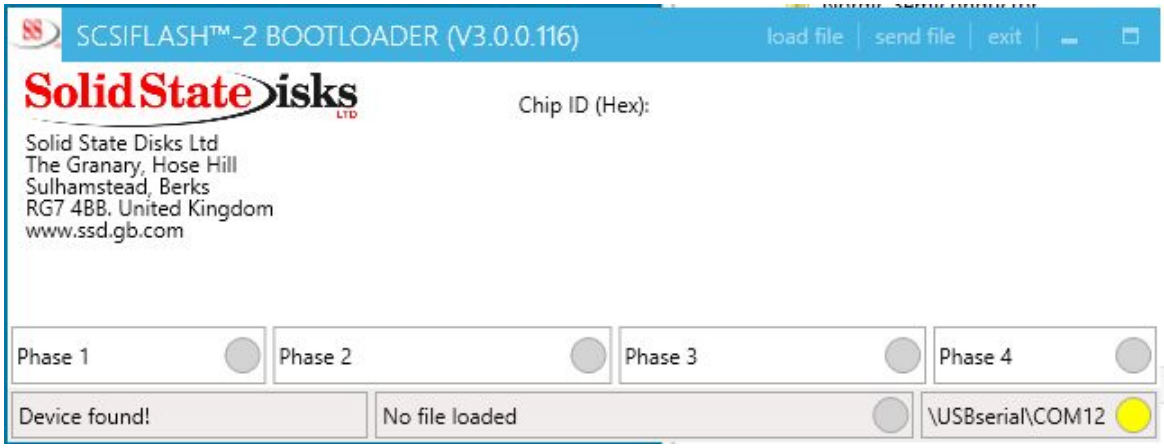
Setup

The below picture shows the connections necessary to the SF2 to have both the firmware update (J12 - the white header next to the compact flash card) and the debugging terminal interface (J4 - the black header to the right of the board).

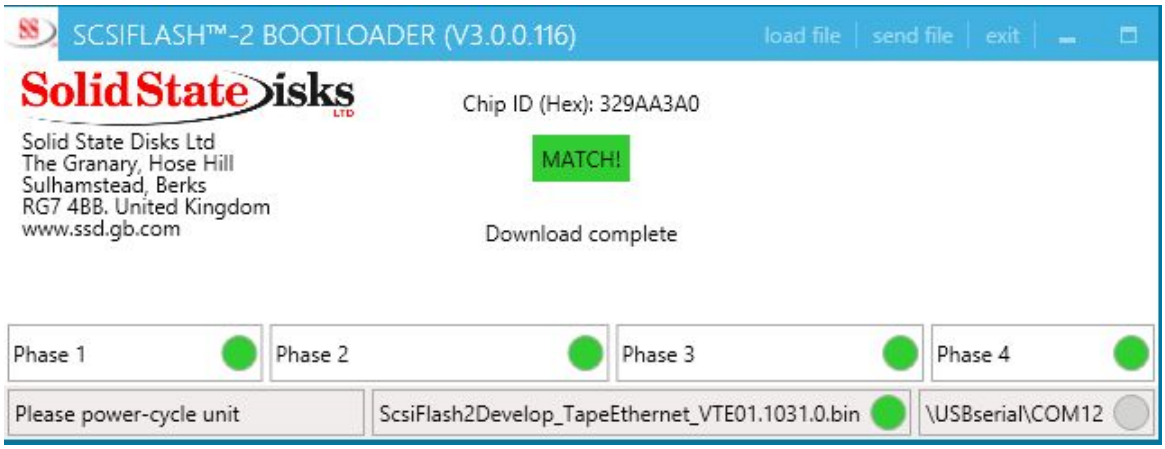
Note that with the terminal interface only the three leftmost pins are used on J4.

Firmware Update

1) Plug the cable into the USB port on the PC and J12 header on the board (J12 is the header closest to the Compact Flash card).
2) Ensure everything is powered up - the heartbeat LED on the SF2 board (LED2) should be flashing.
3) Erase the current firmware by moving the link on J16. In the picture above, J16 is the header directly below the Atmel CPU and with the board in that orientation the link needs to move to the right and then back to the left. The heartbeat LED should stop flashing.
4) Power cycle the SF2.
5) Startup the Bootloader software. It should automatically recognise the device and say 'Device found!' in the bottom left of the screen as in the below screenshot.



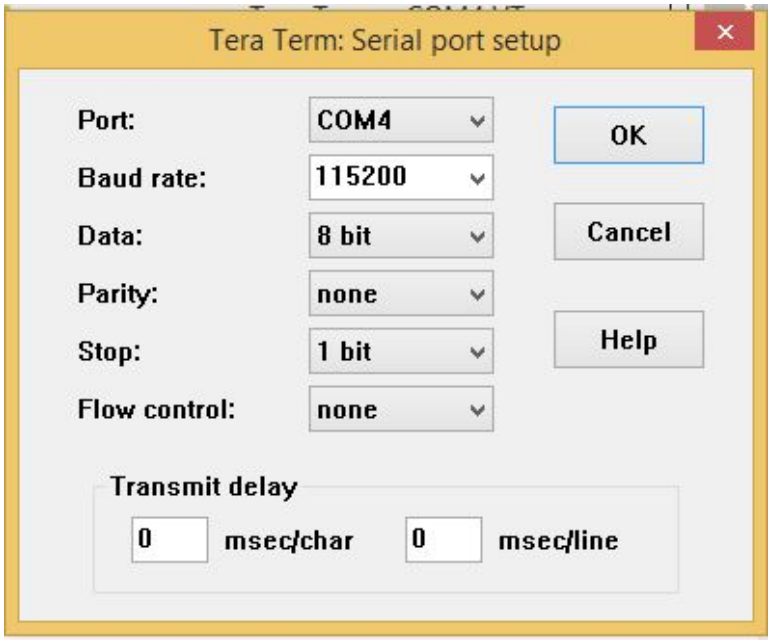
6) Use the load file button at the top of the window to select the new firmware.
7) Use the send file button at the top of the window to program the new firmware. Once the programming is complete the screen should look like this.



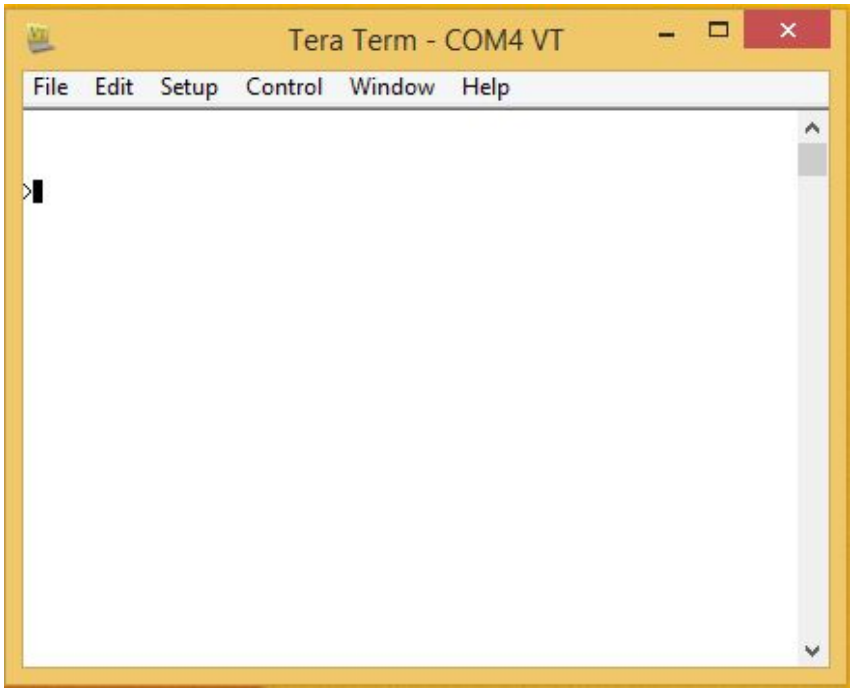
8) Power cycle the SF2 and the heartbeat LED should start again with the new firmware.

Serial Interface

You connect to the serial interface using a Baud Rate of 115,200, 8 bit data, no parity bits, one stop bit and no flow control. To set this up in TeraTerm use the Serial Port entry on the Setup menu and you get the below screen.



Once connected, press Return and you should get a > prompt as per this picture



From there if you type help you get a list of all the available commands, and if you do help <command> you get more details on what that command does and some of the options available to it.

SCSI Tracing

The SF2 supports an onboard trace facility where it can report in detail all of the messages received over the SCSI bus. This can significantly slow down the SF2 therefore needs to be used with caution.

To enable the tracing, enter

```
> trace e
```

To disable the tracing, enter

```
> trace d
```

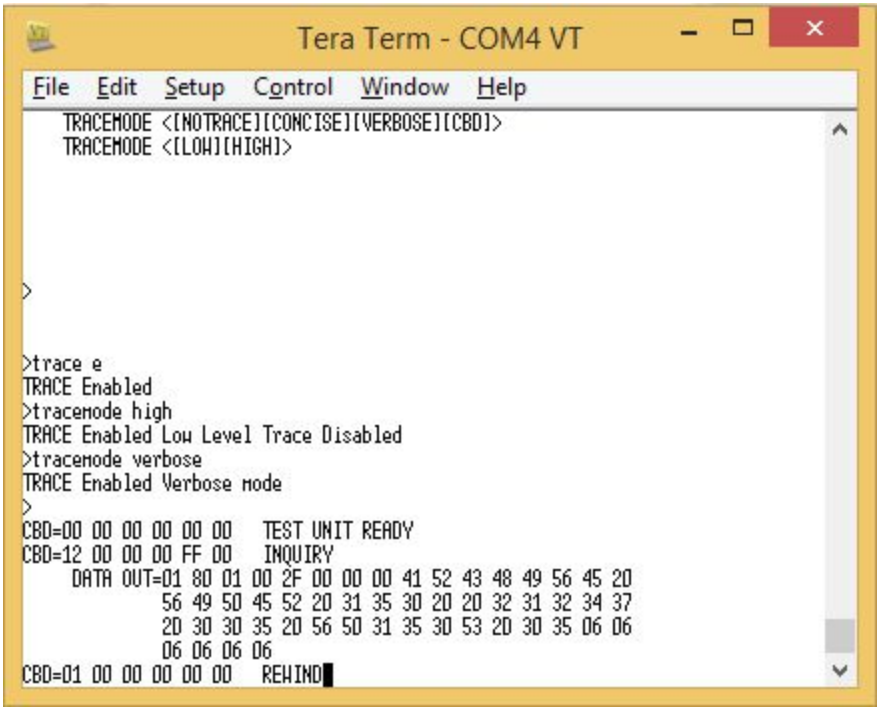
The level of tracing can be controlled with the tracemode command. There are two formats to this command

```
TRACEMODE <[NOTRACE][CONCISE][VERBOSE][CBD]>
```

which sets the level of SCSI command tracing, and

```
TRACEMODE <[LOW][HIGH]>
```

which sets whether low level information on the SCSI messages is reported or not. For initial investigations, VERBOSE and HIGH gives appropriate information. An example screenshot is below.



All Commands

As of version 1030.0, the following commands are available. Note the interface is not case sensitive.

Command	High level help
HELP	Displays Help Information, use HELP <command> for more details.
.	Repeat the previous command
VER	Display firmware revision and checksum.
OFFLINE	Put the scsi bus offline
ONLINE	Put the scsi bus online
START	Put the unit into media started state
STOP	Put the unit into media stopped state
LOAD	Load the media and put unit into LOADED state
UNLOAD	Unload the media and put unit into UNLOADED state
EJECT	Eject the media and put unit into UNLOADED state
STATUS	Print remote status
ERASE	Remote Erase Test
BLANK	Tape Erase Test
WPROTECT	Write protect enable/disable
TRACE	Manage SCSI TRACE functions.
TRACEMODE	Set the SCSI TRACE display mode.
LIST	Display a list of supported devices.
SETDEV	Set the device to be emulated.
SETBLOCK	Set the device block size in bytes

DELAY	Manage the access time settings. Choose from the native access time of the DEVICE being emulated or a CUSTOM setting by the user. The custom value must be set separately
FORMAT	Set the SCSI FORMAT command formatting options. FULL takes some time to complete, QUICK very fast format mode
CAPACITY	Manage the capacity settings. Choose from the native capacity of the DEVICE being emulated or the inserted MEDIA (CF card), or a CUSTOM setting by the user. The custom value must be set separately.
SPINUP	Enable emulation of the disk media spin up delay.
LOADTIME	Enable emulation of the tape media load delay.
CONFIG	Display the configuration settings.
CF	Manage at91SAM9XE compact flash.
SCSI	Manage SCSI test functions.
SETETH	Manage Ethernet TCP/IP config.