



Future Technology Devices International Ltd.

Application Note

AN_136_Hi-Speed Mini Module EEPROM Disaster Recovery

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The FTDI Hi-Speed USB devices FT2232H and FT4232H are provided on development modules (Mini modules). These modules are fitted with an 93C56 EEPROMs that are used for configuring descriptors and operational parameters. Occasionally users have corrupted these EEPROMs, rendering the module unusable. The contents of this document provide steps to recovering the modules.

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1 Introduction

The FTDI Hi-Speed USB devices FT2232H and FT4232H are provided on development modules (Mini modules). These modules are fitted with 93C56 EEPROMs that are used for configuring descriptors and operational parameters. Occasionally users have corrupted these EEPROMs, rendering the module unusable. The contents of this document provide steps to recovering the modules.

2 What are Hi-Speed Mini Modules.

Hi-speed mini modules were developed to assist in the development of designs using the FT2232H and FT4232H ICs. The FT2232H based module may be used to convert one USB port to either 2 UARTs, 2 FIFOs, 2 MPSSE or a combination of these interfaces. The FT4232H based module may be used to convert one USB port to either 4 UARTs, 2 MPSSE or a combination of these interfaces.

For more information on the modules please refer to:

<http://www.ftdichip.com/Products/EvaluationKits/HiSpeedModules.htm>

3 The EEPROM

The modules are fitted with 93C56 EEPROMs.

3.1 What the EEPROM Contains

The EEPROM contains standard descriptors to allow for unique identification of the device e.g. VID, PID, Serial number and strings such as manufacturer and product name.

In addition to the descriptors there are functional parameters that allow the device to be configured into different modes e.g. UART or FIFO.

At the end of the EEPROM there is a checksum that is then used to validate the contents of the EEPROM.

3.2 Programming the EEPROM

Programming the EEPROM is most easily done by using [FT_PROG](#) which is a free utility from FTDI which allows programming the device from a GUI based template. This is the easiest method.

However the option for customers to create their own tools exists by utilising the D2xx function calls. This is perhaps where the greatest scope for error occurs.

If the EEPROM becomes corrupted, it is possible that a combination exists where the FT2232H or FT4232H device can no longer be enumerated with the EEPROM in circuit. The next section will discuss recovering the device without removing the EEPROM from the board.

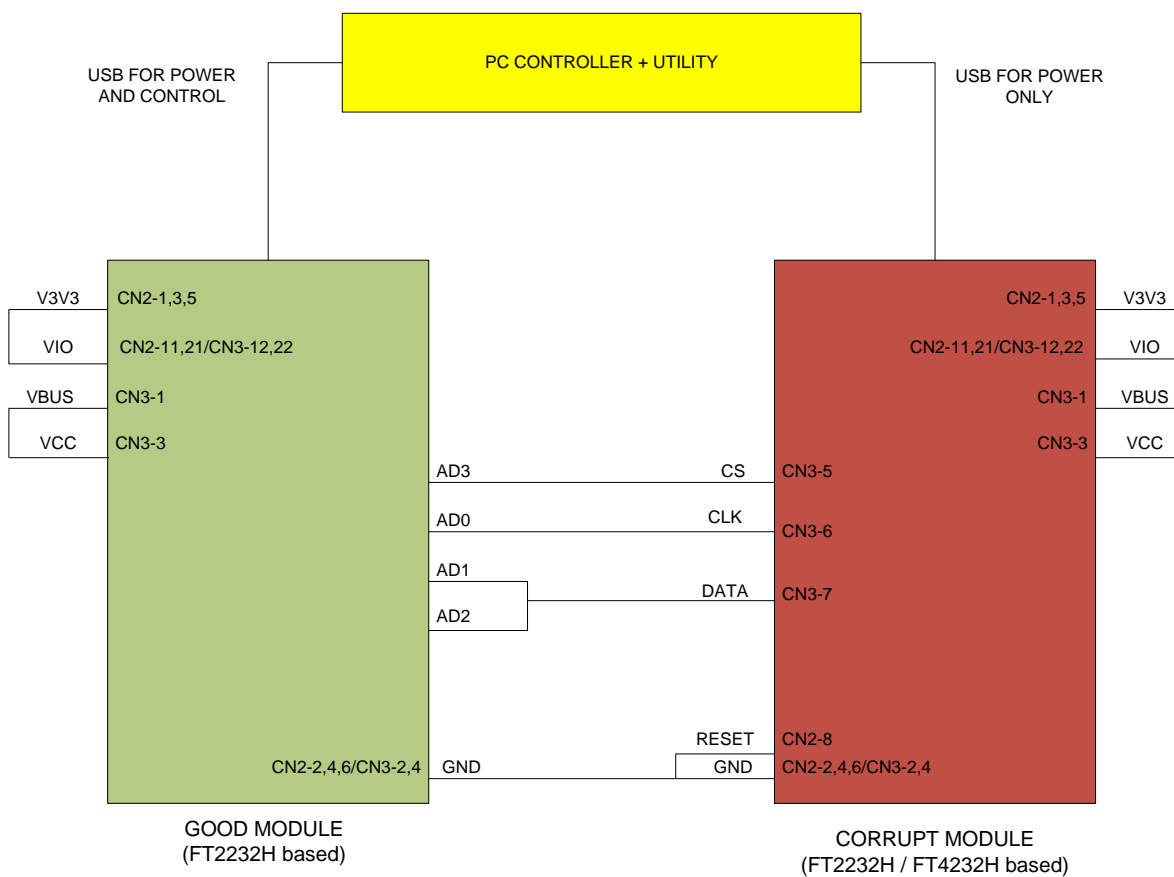
4 Recovery

The basic concept of the recovery is to wire the SPI pins of the EEPROM to an external control to reprogram all the EEPROM bits to FF (equivalent to an erase).

The method used in this document makes use of the MPSSE mode of a good FT2232H mini-module, but it is also possible to use an FT2232D or FT4232H device.

4.1 Hardware connection

The block diagram below shows the required connections between the two modules. It works for both FT2232H and FT4232H mini modules.



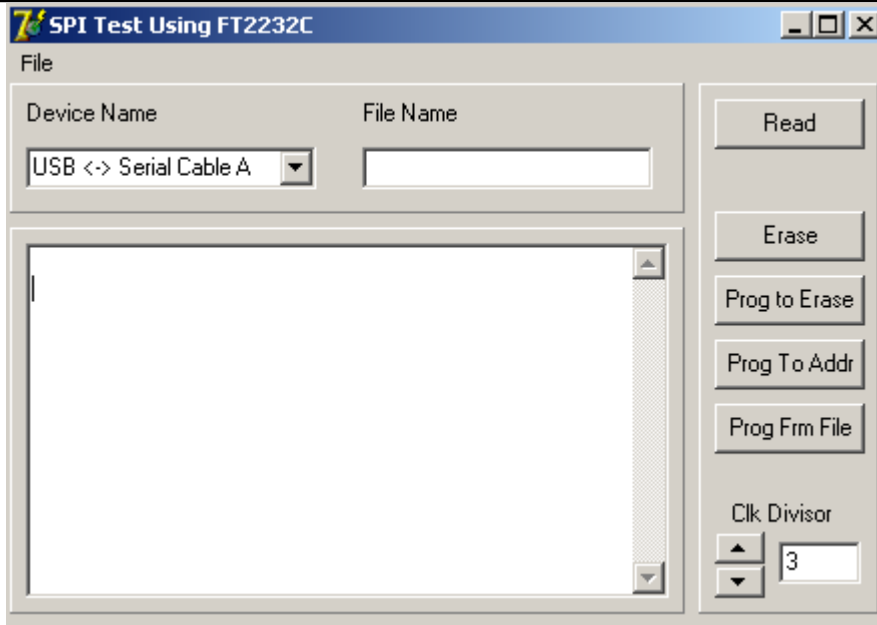
Power to both modules is shown as being provided by the PC USB port. However it would be possible to replace that with an external supply.

4.2 Software Utility

When the hardware is wired up download the recovery application from:

<http://www.ftdichip.com/Resources/Utilities/SPITest.zip>

Run the executable.



Select device channel A in the "Device Name" box. The actual text displayed will depend on the product descriptor you have used in the device EEPROM.

Select "Prog to Erase" to recover the device. This is simply writing FF to each address location in the device.

The corrupt module may now be installed on a PC and can be correctly configured with FT_Prog.

5 Contact Information

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Distributor and Sales Representatives

Please visit the Sales Network page of the [FTDI Web site](#) for the contact details of our distributor(s) and sales representative(s) in your country.

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Appendix A - Abbreviations

Terms	Description
EEPROM	Electrically Erasable Programmable Read Only Memory
FTDI	Future Technology Devices
MPSSE	Multi Purpose Synchronous Serial Engine
SPI	Serial Peripheral Interface

Appendix B – References

Hi-Speed Mini Modules <http://www.ftdichip.com/Products/EvaluationKits/HiSpeedModules.htm>

FT_Prog http://www.ftdichip.com/Resources/Utilities/FT_PROG.zip

D2xx Programmers Guide

[http://www.ftdichip.com/Documents/ProgramGuides/D2XX_Programmer's_Guide\(FT_000071\).pdf](http://www.ftdichip.com/Documents/ProgramGuides/D2XX_Programmer's_Guide(FT_000071).pdf)

Interfacing FT2232H device to SPI

http://www.ftdichip.com/Projects/MPSSE/AN_114_FTDI_Hi_Speed_USB_To_SPI_Example.pdf

Recovery utility

http://www.ftdichip.com/Resources/Utilities/SPI_Test.zip

Appendix C – Revision History

Revision	Changes	Date
0.1	Initial Draft	2009-11-19
1.0	First release	2010-02-17