

# **Restoring the Spartan-3A Evaluation Kit to its Original State**

Version 10.1.00

## Revision History

Version	Description	Date
10.1.00	Initial draft release	June 24, 2008

## Explanation

The Spartan-3A Evaluation Kit contains three pieces of non-volatile memory:

1. Spansion Serial NOR Flash (128 Mbit)
2. Spansion Parallel NOR Flash (32 Mbit)
3. Cypress PSoC internal Flash (16 Kbyte)

When the board ships from Avnet, the Spansion Serial NOR Flash contains the FPGA bitstream configuration image (as described in the *Spartan-3A Evaluation Kit Quick Start*). The Cypress PSoC internal Flash is pre-programmed with a working design as well. The Spansion Parallel NOR Flash contains a counting pattern that is a remnant from the production test at the contract manufacturer.

After normal use and experimentation with the kit, users will commonly modify the contents of one or all of these pieces of non-volatile memory. To restore the kit to its original state, the Spansion Serial NOR Flash and the Cypress PSoC must be re-programmed with their original contents. Also, the board's jumpers must be returned to their original state. This document shows how to do all of these things.

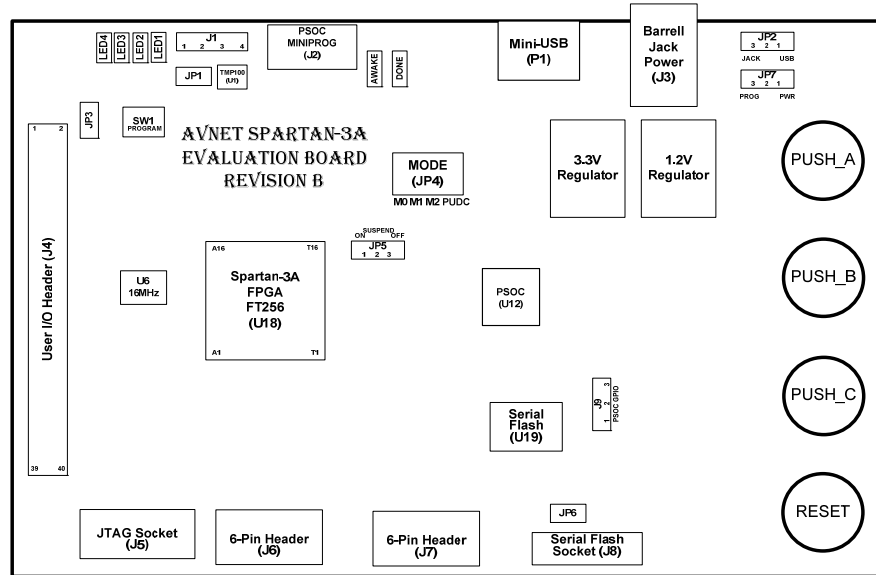
The archive containing this document is available at [www.em.avnet.com/spartan3a-evl](http://www.em.avnet.com/spartan3a-evl) →  
Download Support Files.

## Restoring the jumpers

The jumpers should be set as follows (refer to the table and diagram below):

**Table 1 – Spartan-3A Evaluation Board Original Jumper Settings**

Jumper	Function	Pin Setting	Mode	Description
JP1	Flash Write Protect	Pins 1-2	Open	No write protect
JP2	Power Source #1	Pins 1-2	Closed	USB (P1) Power
JP3	Power-on Reset / PROG	Pins 1-2	Open	No Reset, PROG released
JP4	Mode	Pins 1-2	Open	Master SPI
		Pins 3-4	Closed	
		Pins 5-6	Closed	
	PUDC	Pins 7-8	Open	No pull-ups during configuration
JP5	FPGA Suspend	Pins 2-3	Closed	Disable suspend mode
JP6	External SPI	Pins 1-2	Closed	Disable external SPI
JP7	Power Source #2	Pins 1-2	Closed	USB (P1) Power



**Figure 1 – Spartan-3A Evaluation Board Jumper Diagram**

## Restoring the PSoC image

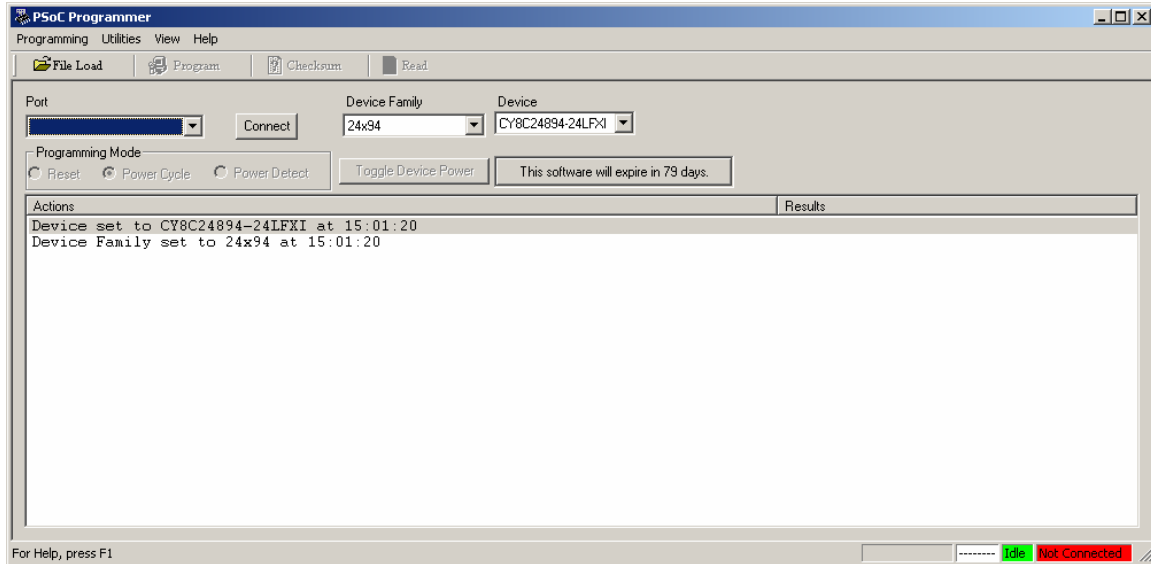
Included in the archive with this document is a file called `Spartan3AEval_PSoC_Firmware_V101.hex`. This is the programming code for the Cypress PSoC. To restore this .hex file to the PSoC, perform the following steps.

1. If not previously done, download and install PSoC Programmer. This is provided free by Cypress at [www.cypress.com/go/avnetkit](http://www.cypress.com/go/avnetkit).
2. Connect the USB cable and MiniProg programmer, both included in the CY3217 box included with the Spartan-3A Evaluation Kit. A green "Status" LED should light and flicker.



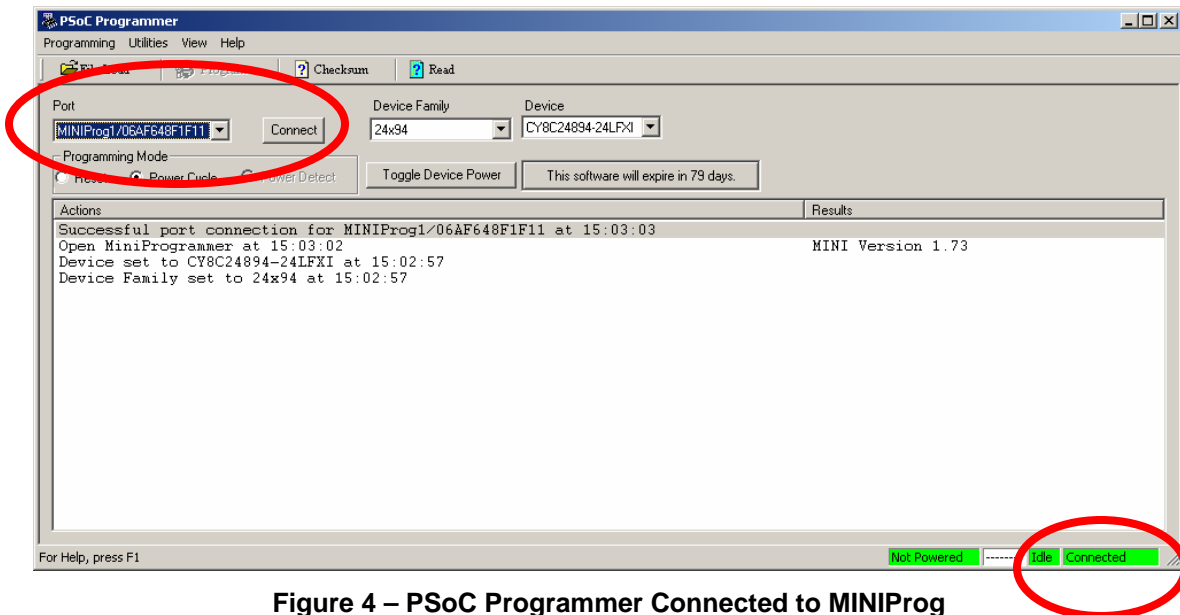
**Figure 2 – Cypress PSoC MiniProg Programmer**

3. Plug the MiniProg onto the J2 header on the board. Due to the key on J2, the MiniProg can only plug in one way. Vdd on the MiniProg matches with J2 Pin 1.
4. Plug the other USB cable into the PC and the board. This will immediately power the board, as indicated by the D1 green LED illuminating. If the serial Flash is currently programmed with a valid bitstream, then the D7 blue DONE LED and other user LEDs may light. This is OK.
5. Launch PSoC Programmer.



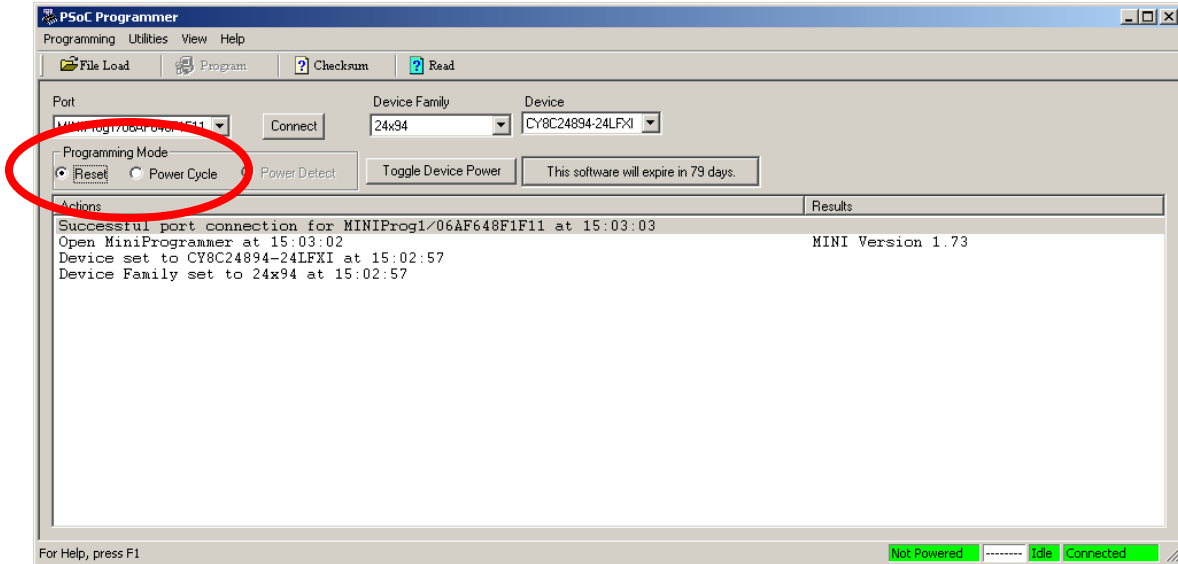
**Figure 3 – PSoC Programmer Launched**

6. Connect to the MiniProg by selecting “MINIProg” from the Port list and pressing the **Connect** button. The status bar in the lower right-hand corner should change to a green “Connected” message.



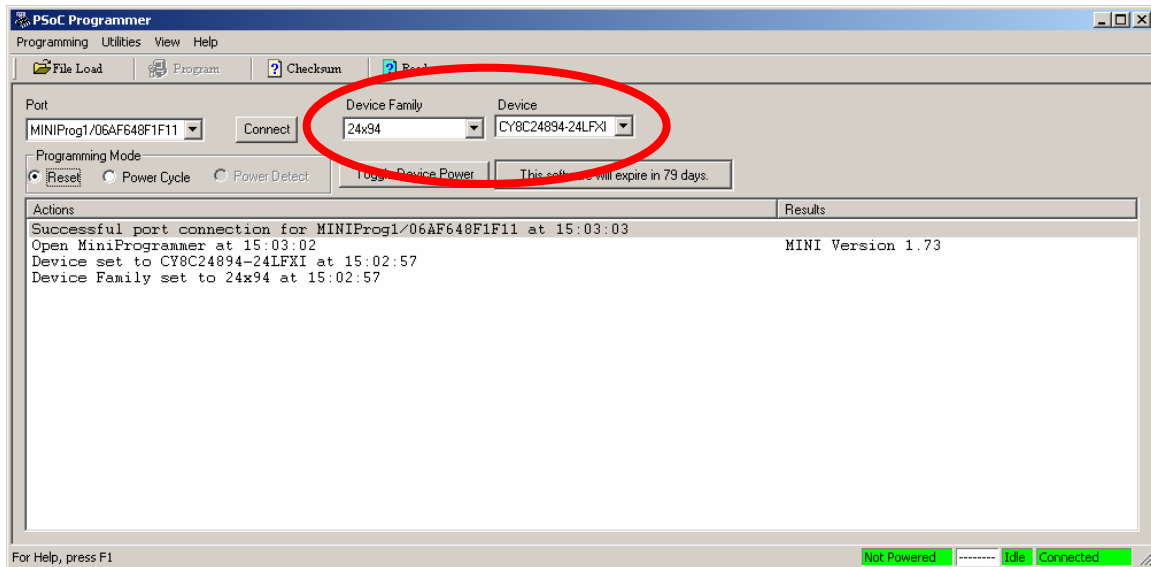
**Figure 4 – PSoC Programmer Connected to MINIProg**

7. Select the *Programming Mode* radio button for *Reset*.



**Figure 5 – Reset Programming Mode**

8. Select the *Device Family* to be **24x94**. Select the *Device* to be **CYC24894-24LFXI**.



**Figure 6 – Device Family and Device Set**

9. Select the **File Load** button. Browse and Open the Spartan3AEval\_PSoC\_Firmware\_V101.hex file.

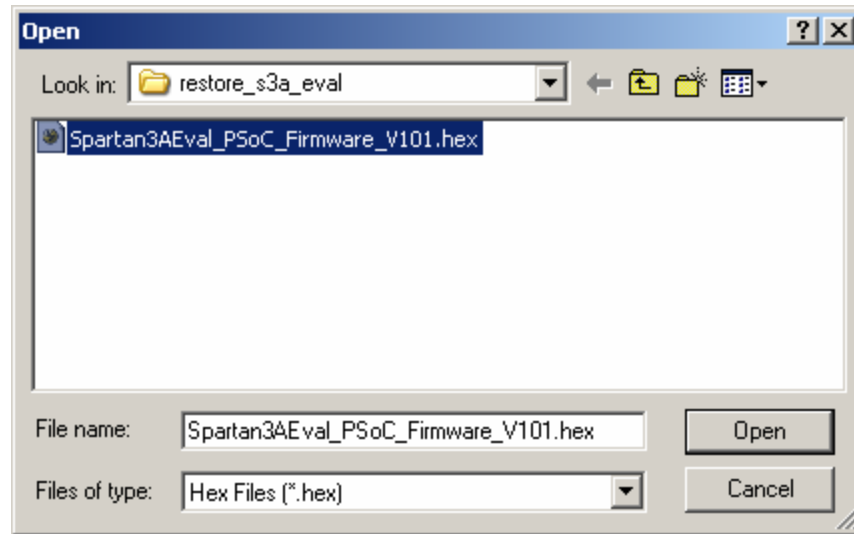


Figure 7 – Original .hex File Selected

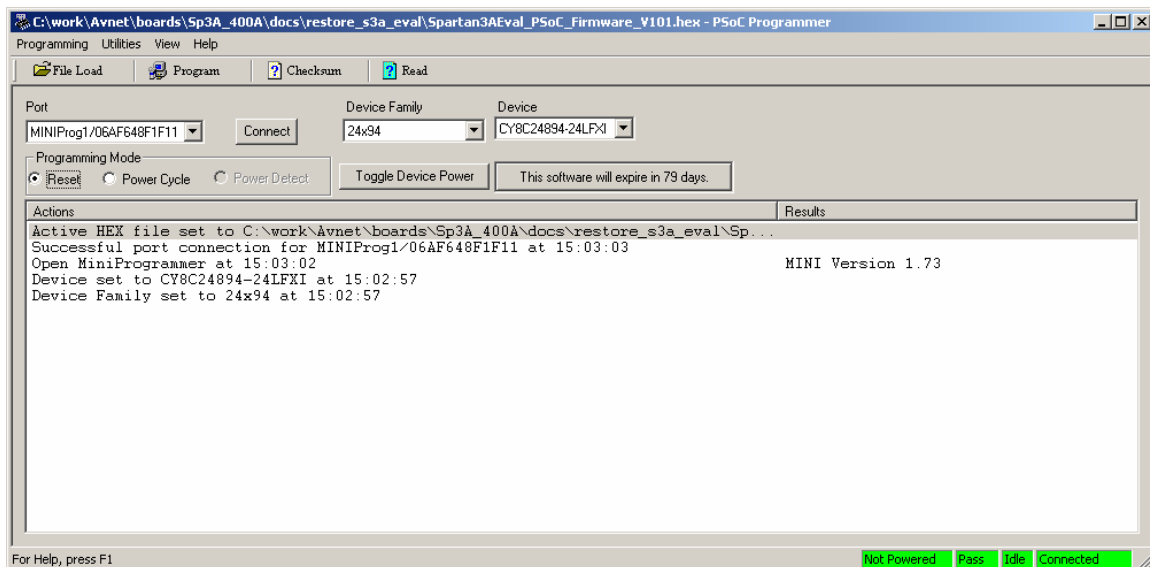
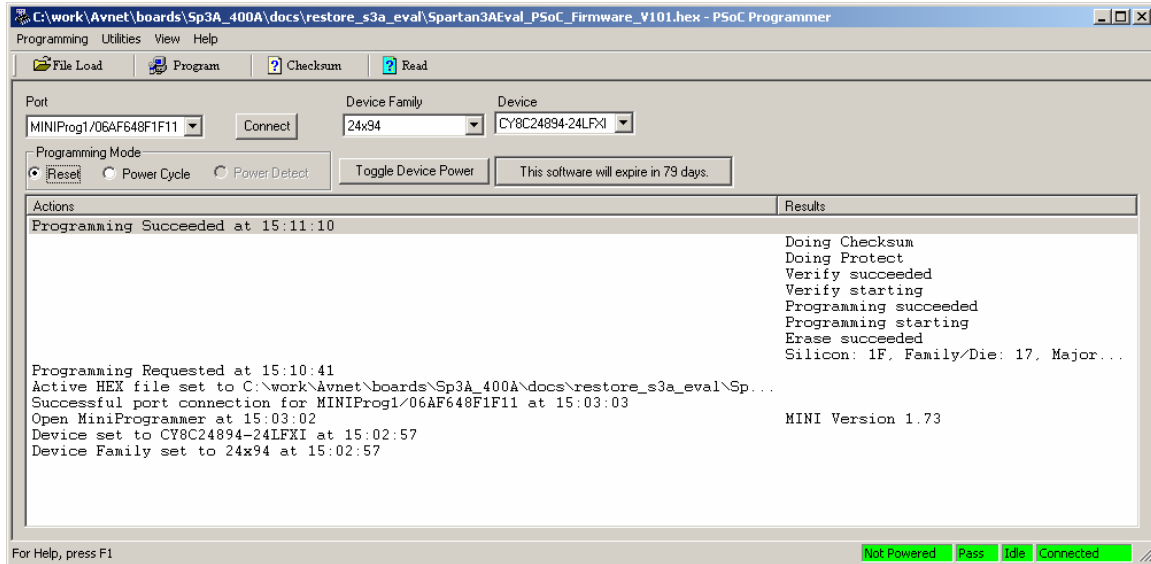


Figure 8 – PSoC Programmer with an Active HEX File

10. Press the **Program** button. PSoC Programmer identifies the device, then erases it, then programs it. Look for the “Programming Succeeded” message in the console window.



**Figure 9 – Programming Succeeded**

11. The MiniProg can be unplugged from the board and the PC and put away. Also, unplug the USB cable from the board

## Restoring the serial Flash

Included in the archive with this document is a file called `Spartan3AEval_FPGA_Firmware_V10.bit`. This is the bitstream for the Spartan-3A FPGA and can be configured directly to the FPGA using AvProg or iMPACT. This bitstream is also stored in the serial Flash as non-volatile storage for power-on FPGA SPI configuration. The steps to reprogram the serial Flash with this bitstream are outlined below.

1. If not previously performed, install AvProg v334 as detailed in the *Avnet Programming Utility User Manual*.
2. Plug the USB cable into the board.
3. If not previously performed, install the driver for the board as detailed in the *Avnet Programming Utility User Manual*.
4. Use Device Manager to determine the COM port assigned to the board.

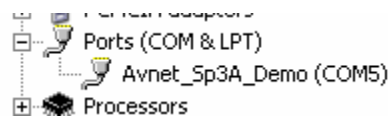


Figure 10 – Device Manager Ports

5. Launch AvProg.

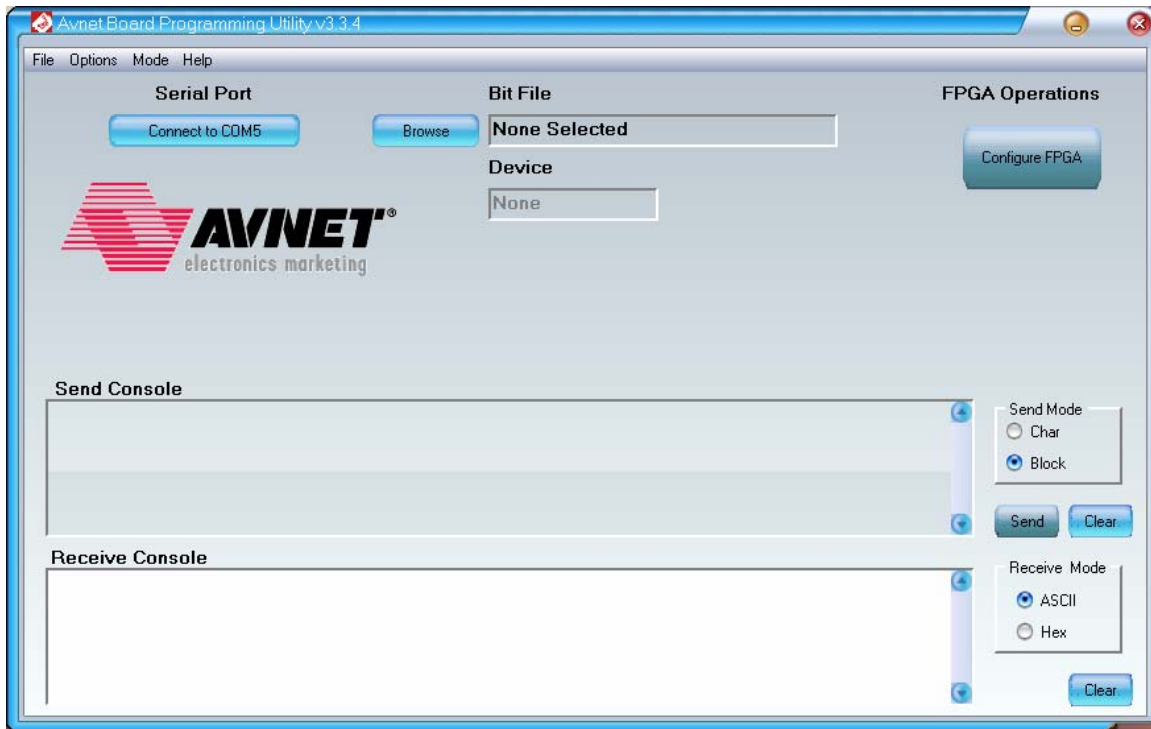


Figure 11 – Avnet Board Programming Utility - AvProg

6. Connect to the board by clicking on the “Connect to COMx” button. If successful, the button label should change to “Disconnect from COMx.”
7. Select **Mode → Program SPI Flash**

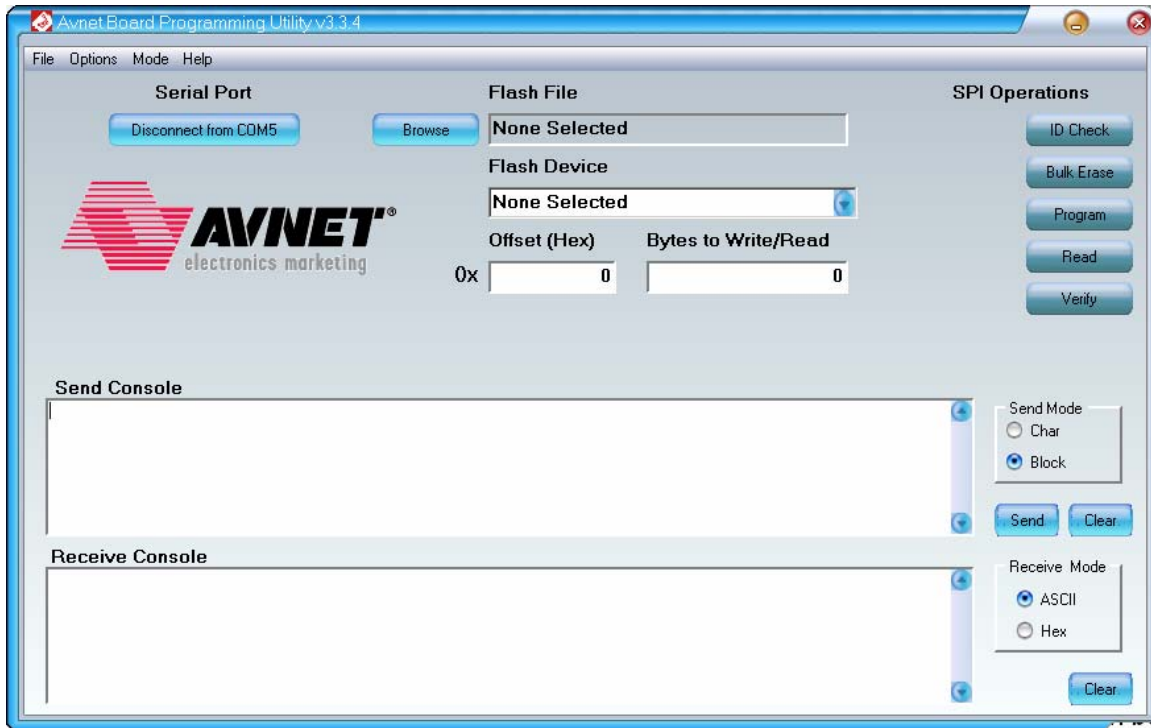


Figure 12 – Program SPI Flash Menu

8. Use the pull-down menu under *Flash Device* to select the *avt\_s25fl128p\_64kb*, which is the definition file for the Spansion S25FL128P serial Flash.

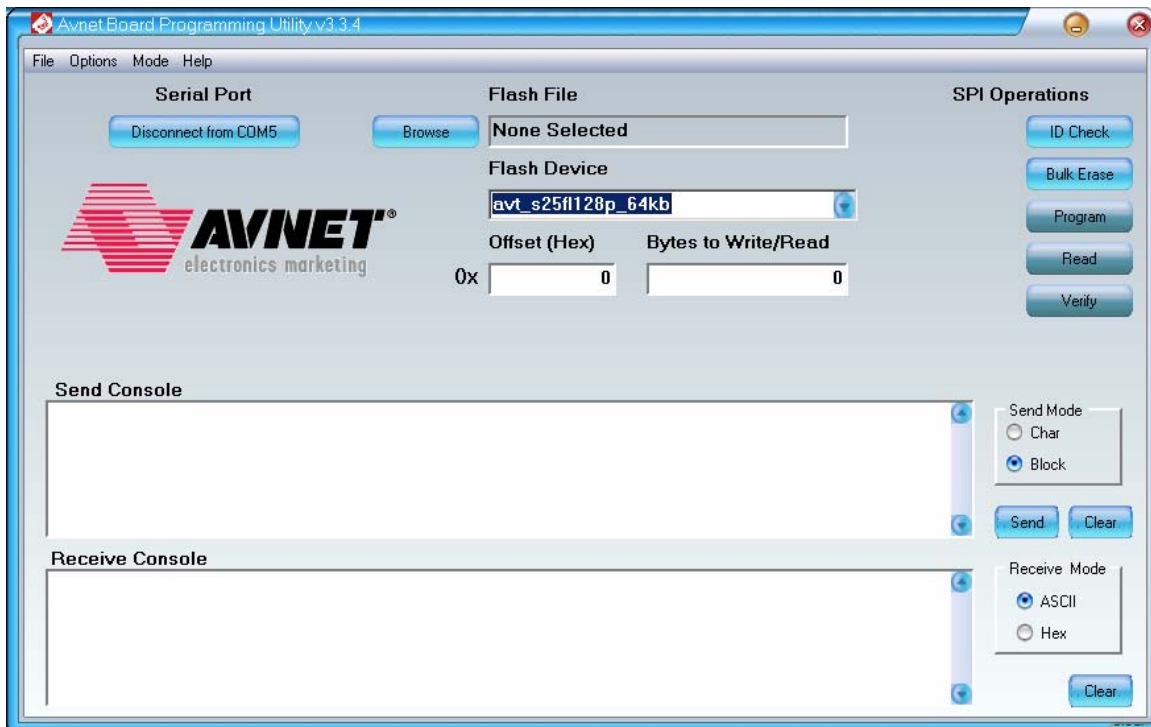
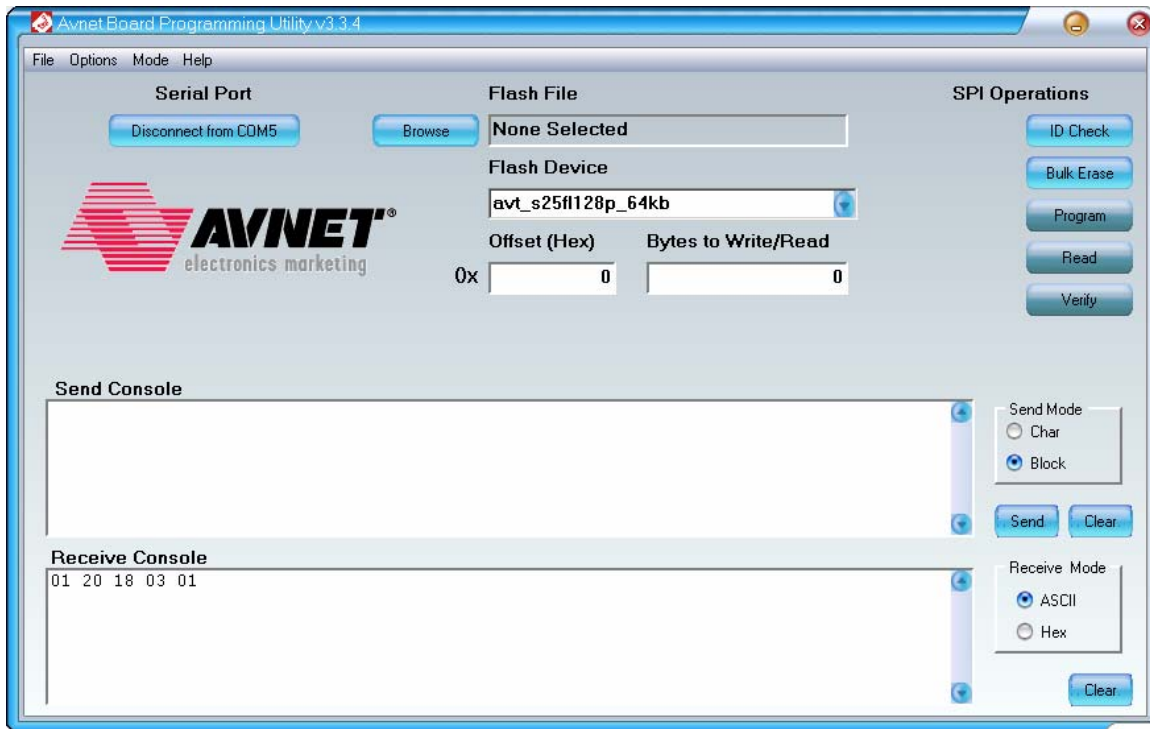


Figure 13 – Spansion S25FL128P Serial Flash Selected

9. To ensure communications are set up properly, click on the **ID Check** button. AvProg verifies the five ID bytes for the serial flash and echoes the bytes to the Receive Console.



**Figure 14 – ID Check Succeeded**

10. Click on the **Bulk Erase** button to erase the device. While erasing, the status bar scrolls to indicate progress. The total erase time is approximately one to two minutes. When finished, verify the "Bulk Erase confirmed" message in the Receive Console.

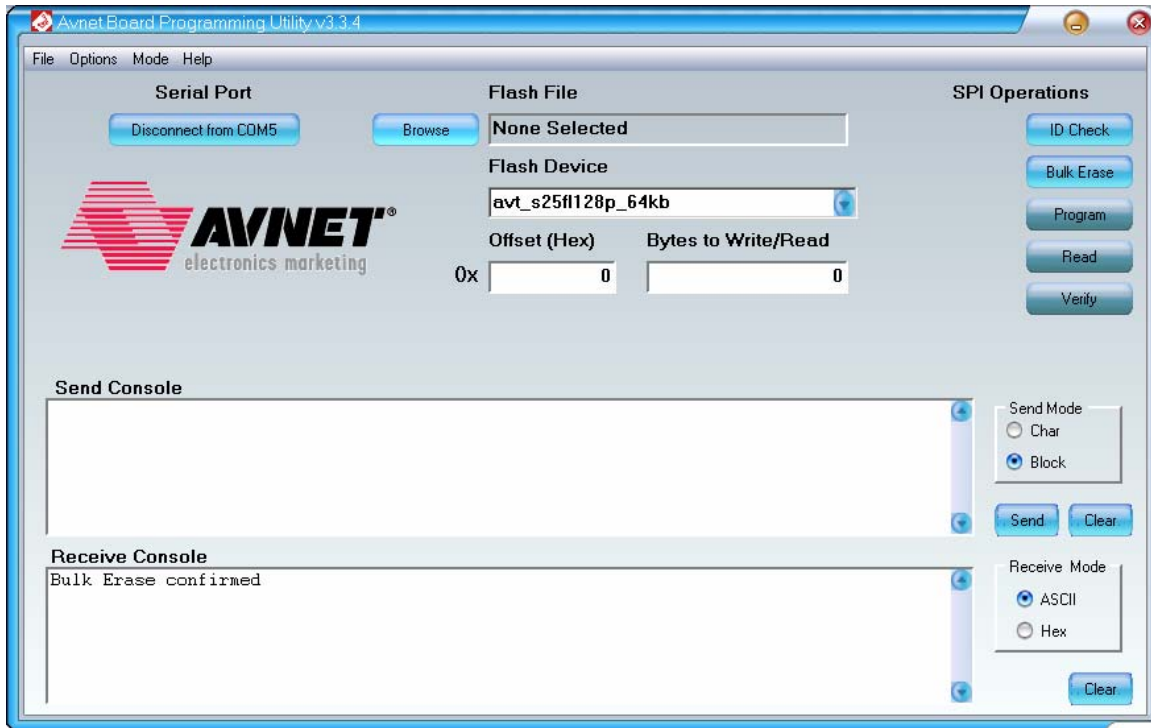


Figure 15 – Bulk Erase Confirmed

- Click on the **Browse** button next to the *Flash File* field. Select the `Spartan3AEval_FPGA_Firmware_V10.bit` bitstream.

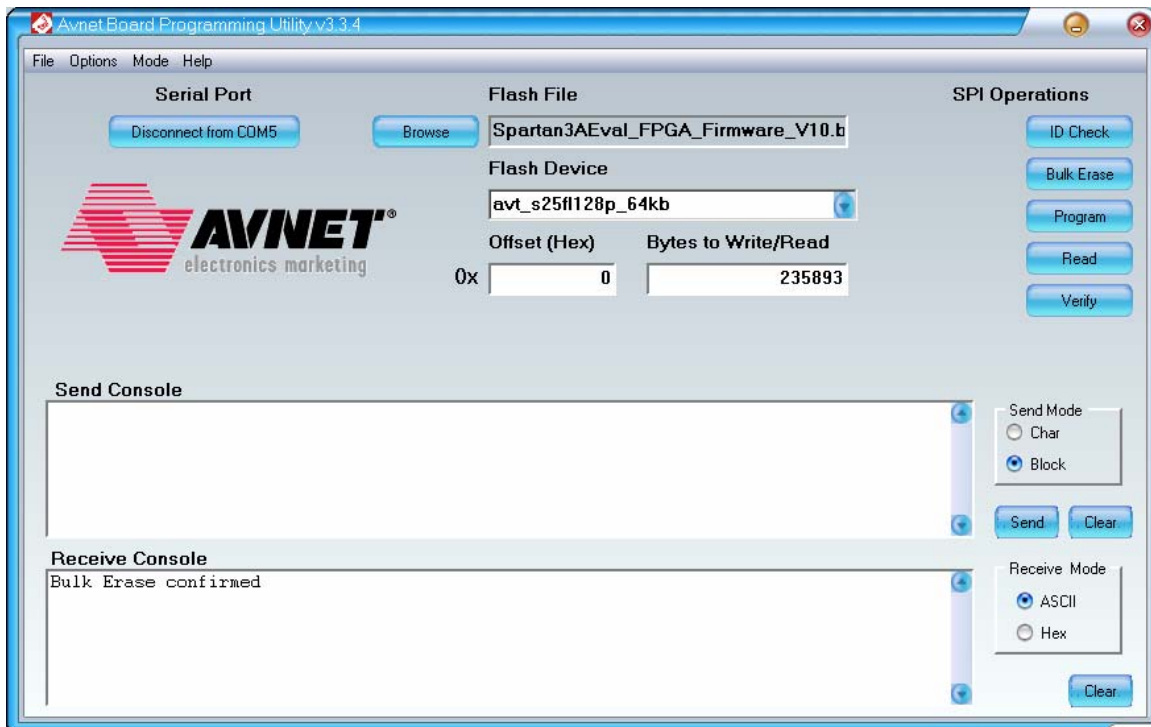


Figure 16 – Flash File Selected

12. Press the **Program** button. Click **Yes** to confirm that the sectors are erased. The status bar again scrolls to indicate programming time. When finished, AvProg reports “SPI programming successful” to the Receive Console.



Figure 17 – Erase Confirmation

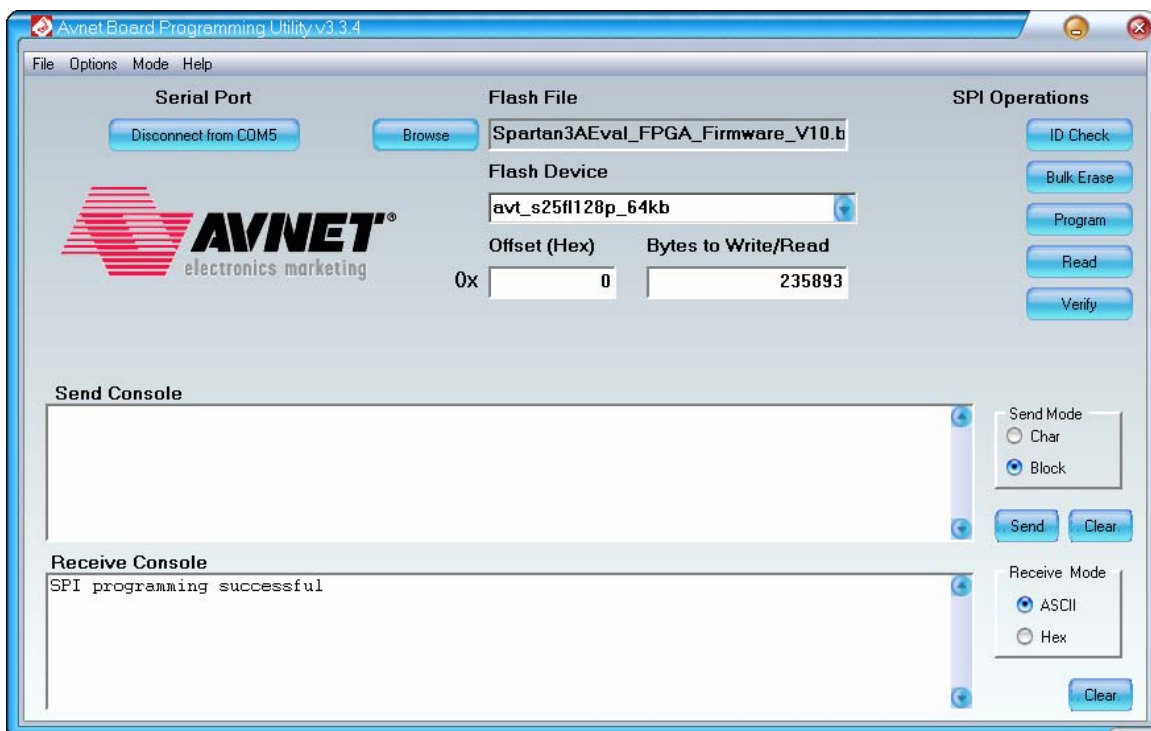
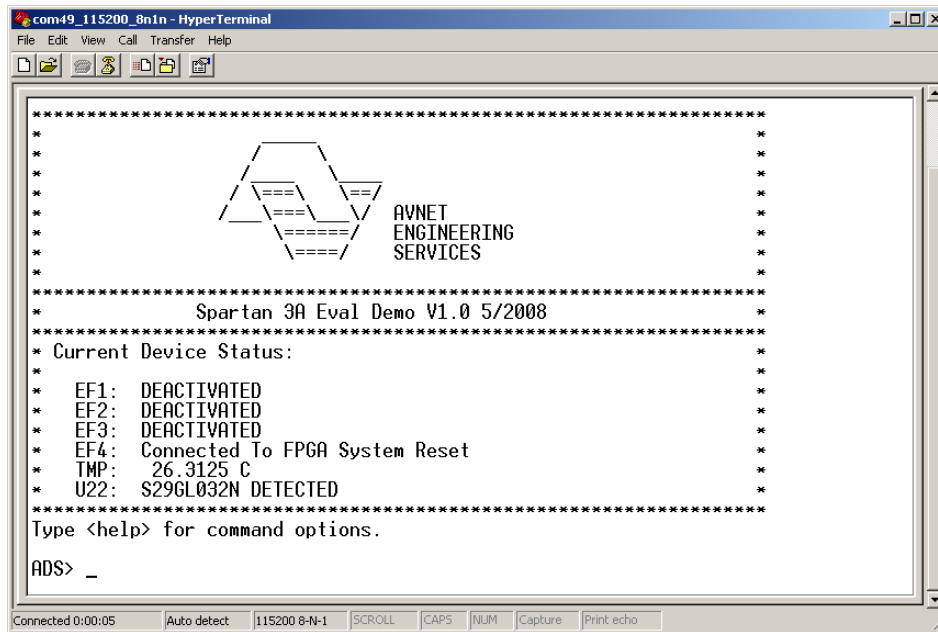


Figure 18 – SPI programming successful

13. Unplug the USB cable.

The board is now restored to its original state. The next time the USB cable is plugged in, the board should operate as described in the *Quick Start*. The D1 green LED illuminates. The D7 DONE blue LED also lights since the board has been set to configure from SPI flash, and the board's FPGA image has been restored to the SPI flash. The D6 green LED also lights, and the four green LEDs D[2:5] light in a rotating pattern. Additionally, AvProg or HyperTerminal can be used to view the UART output.



**Figure 19 – UART Output from Spartan-3A Eval Board In Its Original State**