Avnet Programming Utility
FAE Field Guide

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1.0   Introduction

This manual describes additional features of the Avnet Programming Utility that have not been made available to the general customer base.   In the event that a customer encounters difficulties working with the FPGA , SPI or BPI flash on the Spartan-3A Eval board, these features can help with on-site debugging.

It is expected that the vast majority of customers will encounter no problems. However, during development we did find a few differences when testing on a number of host PCs, and the AvProg code was adjusted to accommodate any situation we could reasonably anticipate. Since there is no way to guarantee 100% operability on every Windows XP or Windows Vista host, certain debugging features added to aid the development were left intact, but are hidden and are also password protected.

This will hopefully allow an FAE to get a customer up and running immediately, but will prevent customers from changing some of the timing parameters in the software, which could easily cause the operation to fail and generate false trouble reports.

Note that the debug settings are not persistent after the application is closed, and must be reset on each subsequent run. If you need to use the Debug Panel as an interim step to help a customer, please report this to the support group for possible program enhancement.

2.0   Accessing the Debug Panel

To access the debug panel, perform these steps:
1.   Launch AvProg normally.
2.   Double-click anywhere in the Avnet logo on the main panel.
3.   Under the Help menu, you will now have a new item called **Debug Panel**.
4.   Select **Help | Debug Panel** and a password dialog will appear.
5.   Enter **4212** for the password and click **OK**. This will reveal the hidden controls below the Receive Console as shown below.
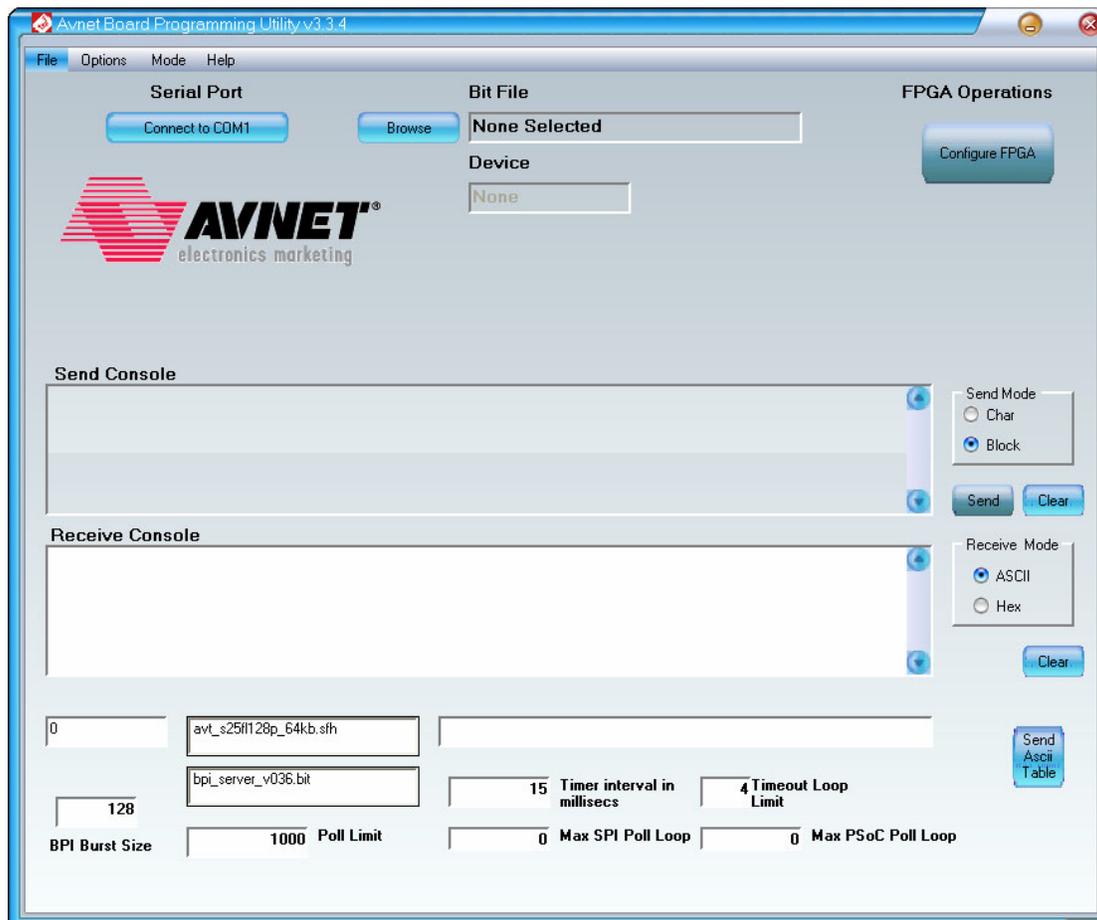
3.0 Debug Panel Controls

This section describes the purpose of all the debug controls, and how they can be used to affect the program operation in cases where normal functions are not working. Not all of the controls can be changed; some are simply data elements that are used in normal program operation. In general, the controls that are labeled can be changed, while the unlabeled controls should be viewed but not altered.

## 3.1 Send ASCII Table Button
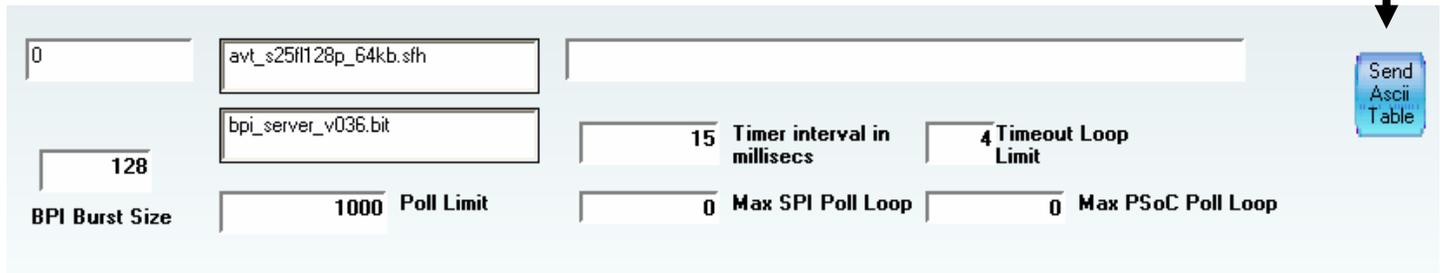
Use when: AvProg successfully connects to the board, but none of the operations seem to be working. This is a symptom that the serial communications are being corrupted, probably by an unsupported operating system setting.

What to do:
1. Connect a null modem serial cable between your laptop and the host system.
2. Launch AvProg on your laptop, and set it up to receive incoming data in Hex mode.
3. Launch AvProg on the customer host, and click the Send ASCII Table button.

On your laptop, you should see all the hex values for ASCII characters from 0x0 through 0xFF. If the characters are out of sequence, then corruption of the serial data is occurring at the source. The most common cause of this occurs when using a UniCode character set on the host system. Check the Known Issues section in the AvProg User Manual for a work-around.

3.2 Poll Limit and Max PSoC Poll Loop
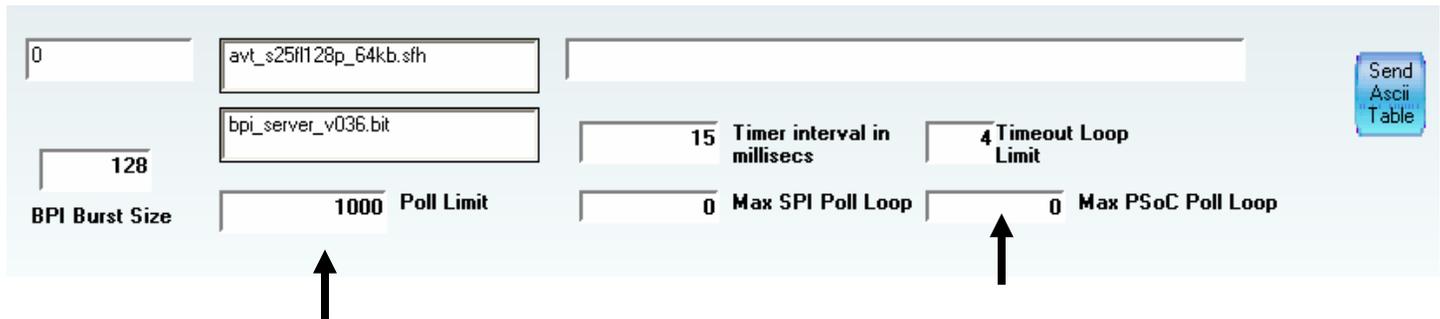
Use when: If you see the following message repeatedly, and it appears that SPI programming is not working:

Timed out: no PSoC echo in state nn

During the SPI programming sequence, there are a number of messages requiring the PSoC firmware to perform an operation and return the result to the host. The host polls the USB-Uart waiting for a response, but to prevent AvProg from hanging, the Poll Limit provides an upper bound for loop exit.   It is possible on new, very fast, host systems, this limit has not been set high enough by default.

The Max PSoC Poll limit records the highest iteration seen in the loop execution. If it is equal to or exceeds the Poll Limit, this indicates the Poll Limit is too low.

What to do:
Increase the Poll Limit and try SPI programming again.   Try doubling the value as a starting point..

3.3 Timer interval in millisecs and Timeout Loop Limit

0	avt_s25fl128p_64kb.sfh		Send Ascii Table
	bpi_server_v036.bit	15 Timer interval in millisecs	4 Timeout Loop Limit
128			
BPI Burst Size	1000 Poll Limit	0 Max SPI Poll Loop	0 Max PSoC Poll Loop

Use when: AvProg displays a message box with the text:

No ACK from state nn

AvProg has an internal state machine for each operational mode, and the states are advanced when the PSoC acknowledges the current operation.   The default value has been set as low as possible for performance reasons, but on some hosts it may be necessary to increase the timeout value to receive a response from the board.

What to do:

Increase the value in 10 millisecond increments and try the operation again. If you reach 50 milliseconds and the system still does not work,   try increasing the Timeout Loop Limit as well.

3.4 Max SPI Poll Loop

0	avt_s25fl128p_64kb.sfh		Send Ascii Table
	bpi_server_v036.bit	15 Timer interval in millisecs	4 Timeout Loop Limit
128			
BPI Burst Size	1000 Poll Limit	0 Max SPI Poll Loop	0 Max PSoC Poll Loop

Use when: AvProg displays the following message in the console:

SPI programming failed

This field is for information only, and is set to the highest value required in the polling loop used to ask the PSoC if the SPI operation has been validated.

What to do:

Compare the value in this field to the MPPI parameter in the .sfh file. If it is equal to or greater than the MPPI value, you can increase the MPPI value in the .sfh file, and try the operation again.

3.5 BPI Burst Size

0	avt_s25fl128p_64kb.sfh		Send Ascii Table
	bpi_server_v036.bit	15 Timer interval in millisecs	4 Timeout Loop Limit
128			
BPI Burst Size	1000 Poll Limit	0 Max SPI Poll Loop	0 Max PSoC Poll Loop

Use when: BPI programming is consistently failing.

AvProg sends BPI data to the MicroBlaze server in frames of BPI Burst Size. If the serial channel is not optimal, it is possible that data can be corrupted.

What to do:

Reduce the BPI Burst Size by factors of 2 and retry the operation.

3.6 File Length field

0	avt_s25fl128p_64kb.sfh		Send Ascii Table
	bpi_server_v036.bit	15 Timer interval in millisecs	4 Timeout Loop Limit
128			
BPI Burst Size	1000 Poll Limit	0 Max SPI Poll Loop	0 Max PSoC Poll Loop

Information Only: This field shows the length of the current operational file for the current mode. If this value is different than the length of the actual file, it indicates an error in the application code.

3.7 .sfh file

0	avt_s25fl128p_64kb.sfh		Send Ascii Table
	bpi_server_v036.bit	15 Timer interval in millisecs	4 Timeout Loop Limit
128			
BPI Burst Size	1000 Poll Limit	0 Max SPI Poll Loop	0 Max PSoC Poll Loop

Information Only: Indicates the current .sfh file selected from the dropdown in SPI mode. If this value does not change to match the currently selected file, it indicates an error in the application code.

3.8   Bit file

Information Only: Indicates the current bit file selected for programming. If this file does not correspond to the selected file in Configure FPGA mode, or the server file to program in Program Parallel Flash mode, it indicates an application error.

3.9   File Path

Information Only: Indicates the full path of the current operational file for the current mode. If the full path is incorrect, it indicates a problem with the application.