Programming the SST-PB3-VME-x for a Master or Slave in a VME Controller

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This document applies to the SST-PB3-VME-x interface card.

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Topic Overview

The startup procedure for the SST-PB3-VME-x card has changed from that of the 5136-PFB-VME card. This note explains the steps needed to start the card when used in a VME-based Controller and indicates where the changes have occurred.

About this Technical Note

This note explains how to:

- Configure the card for DP Master operation

- Configure the card for DP Slave operation

Assumptions

- You're familiar with SST-PB3-VME-x cards

- The PB3 interface card is installed according to the hardware documentation

Hardware Used

☒ Interface card	SST-PB3-VME-1 with firmware version 1.12 or higher
☒ Physical I/O	N/A

Software Used

☒ Operating system	N/A
☒ Any other software required (network configuration software)	SST Profibus Products Installation v2.0

Recommended Reading

- SST-PFB3-VME and SST-PFB3-VME-2 Hardware Reference Guide

Network Interface

Master Configuration

Serial Configuration

1. Using the PFB Console or SST Profibus Configuration tool (version 2.0 or greater), create a binary configuration of the Profibus network.

2. Name the binary file: config.bss

3. Cycle power on the VME rack and use Hyperterminal to connect to the card's serial port. See the SST-PFB3-VME & SST-PFB3-VME-2 Hardware Reference Guide for details.

   With the 5136-PFB-VME card, you could only access the serial port after running the firmware. With the SST-PB3-VME-x, you can only access the serial port on startup when just the boot code is running.

4. Using the Ry command, download the config.bss file to the card's flash memory.

5. Using the Autorun command, enable the firmware to run automatically on startup.

   For example: AutoRun=pfb3.ss3

   This ability did not exist in the 5136-PFB-VME card.

6. Issue the Reset command.

Network Interface

Logic Programming

> **Note**
>
> If you are using a Motorola-based controller, such as the GE9070 or RX7i, byte swapping will occur when you write to the Standard Memory Address space. This technical note will reference the offsets given in the Woodhead Profibus Scanner Module Firmware/DLL Reference Guide. In the VME Read Byte or VME Write Byte commands, remember to use the odd address listed below for even addresses, and the previous even addresses for odd addresses.
>
> For example: the Command register is at offset 8000h, so to access it with a VME Read Byte, you would use offset 8001h. For the Status register at offset 8001h, you would use offset 8000h.

The first two steps involve the Short Address space (no byte swapping), while the rest of the procedure involves only the Standard Memory Address space (possible byte swapping).

> **Note**
>
> Because the firmware is set to run automatically on the SST-PB3-VME-x card, there are very few steps to initialize the card compared to the 5136-PFB-VME.

Network Interface

1. Wait 2 seconds for the firmware to start.

2. Choose your base standard address and write the appropriate value to the AddrMatch Register (offset 03h) in the Short Address space. See the Hardware Reference Guide for more details.

3. Set bits 6 and 7 in the Control Register (offset 01h) to enable memory and run the CPU. See the Hardware Reference Guide for more details.

> **Note**
>
> From this point on, the procedure is the same as for the 5136-PFB-VME card, except that the Profibus configuration file has already been loaded to the flash memory via the serial port.

4. Wait 5 seconds or for the Command register (offset 8000h) to change to an E0h, indicating the firmware is running.

5. Issue the CMD_CFG_FLASH_GO_ON command to configure the card from flash memory and put the card online. To do this, write a 32h to the Command register (offset 8000h).

6. Wait for the Command register (offset 8000h) to change to an E1h.

7. Set bit 1 of the pfbMasCntrlCfg register (offset 8028h) to put the Profibus network into Run mode. This should be done with a Read-Modify-Write command (if supported by your controller), or by reading the value in the pfbMasCntrlCfg register, ORing it with a value of 2 and then writing the resulting value back to the pfbMasCntrlCfg register.

8. At this point, the card is online and will try to communicate with the slave in its configuration list. If the attempt is successful, the SYS LED will be Green and the pfbMasSts register (offset 8029h) will have bit 0 set, indicating that data is being exchanged with all slaves.

Reading and Writing Data

From this point on, you will have more logic writing leeway. This technical note will suggest one method for doing this. For more details, refer to the PROFI_USR structure description in Chapter 2 of the SST Profibus Scanner Module Firmware/DLL Reference Guide.

Note

The card's memory is divided into 16K byte logical pages. Only page 2 (offset 8000h) is permanent. The Master Control Block table is on page 3 (offset C000h), the DP Master Transmit Page is on page 5 (offset 14000h) and the DP Master Receive Page is on page 6 (offset 18000h). These page numbers should be double-checked in the DP Master global status and control table (offset 8028h-802fh).

1. Using the Master Status/Block table (offset 8900h – 89ffh), determine the Master Control Block (MCB) each slave is assigned to.

2. Read the MCB for each slave to determine the offset for that slave's data on the DP Master Rx Page and DP Master Tx Page, as well as the length of the slave's data on the DP Master Rx Page and the DP Master Tx Page.

3. Read the slave's input data from the DP Master Rx Page.

4. Write the slave's output data to the DP Master Tx Page.

The PROFI_USR structure can be used to monitor the overall Profibus communication status and the communication status of individual slaves. The Master Control Blocks can be used to view diagnostic data from any slave. Other useful registers will be determined by your application and needs.

Slave Configuration

Serial Configuration

1. Cycle power on the VME rack and use Hyperterminal to connect to the card's serial port. See the SST-PFB3-VME & SST-PFB3-VME-2 Hardware Reference Guide for details.

    With the 5136-PFB-VME card, you could only access the serial port after running the firmware. With the SST-PB3-VME-x, you can only access the serial port on startup when just the boot code is running.

2. Use the Autorun command to enable the firmware to run automatically on startup.

    For example: AutoRun=pfb3.ss3

    This ability did not exist in the 5136-PFB-VME card.

3. Issue the Reset Command.

> ### Note
>
> With the SST-PB3-VME-x, Slave configuration is done entirely through the shared memory interface and not flash. The 5136-PFB-VME could be configured as a Slave in the same manner, but was also able to store the Slave configuration in flash.

Network Interface

Logic Programming

Note

If you are using a Motorola-based controller, such as the GE9070 or RX7i, byte swapping will occur when you write to the Standard Memory Address space. This technical note will reference the offsets given in the SST Profibus Scanner Module Firmware/DLL Reference Guide. In the VME Read Byte or VME Write Byte commands, remember to use the odd address listed below for even addresses, and the previous even addresses for odd addresses.

For example: The Command register is at offset 8000h, so to access it with a VME Read Byte, you would use offset 8001h. For the Status register at offset 8001h, you would use offset 8000h.

The first two steps involve the Short Address space (no byte swapping), while the rest of the procedure involves only the Standard Memory Address space (possible byte swapping).

Note

Because the firmware is set to run automatically on the SST-PB3-VME-x card, there are very few steps to initialize the card compared to the 5136-PFB-VME.

1. Choose your base standard address and write the appropriate value to the AddrMatch Register (offset 03h) in the Short Address space. See the Hardware Reference Guide for more details.

2. Set bits 6 and 7 in the Control Register (offset 01h) to enable memory and run the CPU. See the Hardware Reference Guide for more details.

> **Note**
>
> From this point on, the procedure is the same as for the 5136-PFB-VME card.

3. Wait 5 seconds or for the Command register (offset 8000h) to change to an E0h, indicating the firmware is running.

4. Set the Station Address by writing to the pfbStnAddr register (offset 800Eh).

5. Set the Baud rate by writing to the pfbBaud register (offset 8011h).

6. Set the Slave Transmit length by writing to the slvTxDataLen register (offset 818Ch).

7. Set the Slave Receive length by writing to the slvRxDataLen register (offset 8188h).

8. Enable the Slave by setting bit 15 of the slvCntCfg register (offset 8180h). Do not change any other bits in the register.

9. Issue the CMD_GO_ON to put the card Online. To do this, write a 01h to the Command register (offset 8000h).

10. At this point, the card is online and will be waiting for a DP Master to send configuration and parameterization data to it. Monitor the DP Slave Status register (offset 8182h) to determine when the card is in data communication with the DP Master.

Reading and Writing Data

The slave receive data starts at 8200h and the slave transmit data starts at 8300h.

Technical Support

Technical Support is available during regular business hours by telephone, fax or email from any Woodhead Software & Electronics office, or from http://www.woodhead.com/. Documentation and software updates are also available on the website.

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