Technical Note

SST-PFB-CLX Remote Rack Configuration

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This document applies to the SST-PFB-CLX module.

SST-PFB-CLX Remote Rack Configuration

Topic Overview

To design a redundant Profibus I/O control system with ControlLogix architecture, the SST-PFB-CLX card must be installed in a remote ControlLogix rack. In this setup, it communicates with ControlLogix CPUs via the 1756-CNB family of ControlNet bridge cards.

Although Woodhead's documentation explains how to set up the SST-PFB-CLX card and ControlLogix CPU to communicate through the local rack, no Woodhead documentation describes how to use the card remotely (as required for a redundant system).

About this Technical Note

This technical note documents a test carried out in Asia in May/June 2003. *This document is not a specification.* Its aim is to help automation system designers estimate the number of SST-PFB-CLX cards per remote rack vs. parameters such as byte load.

> **Note**
>
> The results presented in this document may vary with changes in the testing environment, such as the CPU type, RSLogix5000 version, RSNetworx version, SST-PFB-CLX firmware version, actual I/O load, and so on. Accurately determining how many SST-PFB-CLX cards and how much I/O can be remotely configured may depend on the relevant system.

This Technical Note Assumes that

You're familiar with the following:

- Profibus specification fundamentals

- ControlNet specification fundamentals

- ControlLogix development environment (i.e. RSLogix5000, RSNetworx, ControlLogix architecture, and so on)

- The SST-PFB-CLX documentation and the SST Profibus Configuration Tool

Network Interface

Hardware Used

☒ Interface card	SST-PFB-CLX firmware, version **4.05**
☒ Physical I/O	No physical I/O was used for this test. To generate Profibus DP traffic, half of the cards were configured as DP masters and the other half as DP slaves.
☒ Rockwell Hardware	1756-L55/A, version **8.90** 1757-SRM/B, version **3.13** Redundant side: 1756-CNBR/D, version **5.27** 1756-A7, version **8.19** Remote side: 1756-A10/A (version N/A) 1756-CNB/D, version **5.32**

Software Used

|	
☒ Operating system	Windows 2000
☒ Any other software required (network configuration software)	SST Profibus Configuration Tool, version **1.9.7** RSLogix5000, version **8.52.00** RSNetworx, version **4.01.00** RSLinx, version **2.40.01**

Recommended Reading

- ProcessLogix/ControlLogix System Redundancy Module
  http://www.ab.com/manuals/pl/1757-in092c-en-p.pdf

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The Testing Environment

The following testing environment was used.

Figure 1:   The Testing Environment
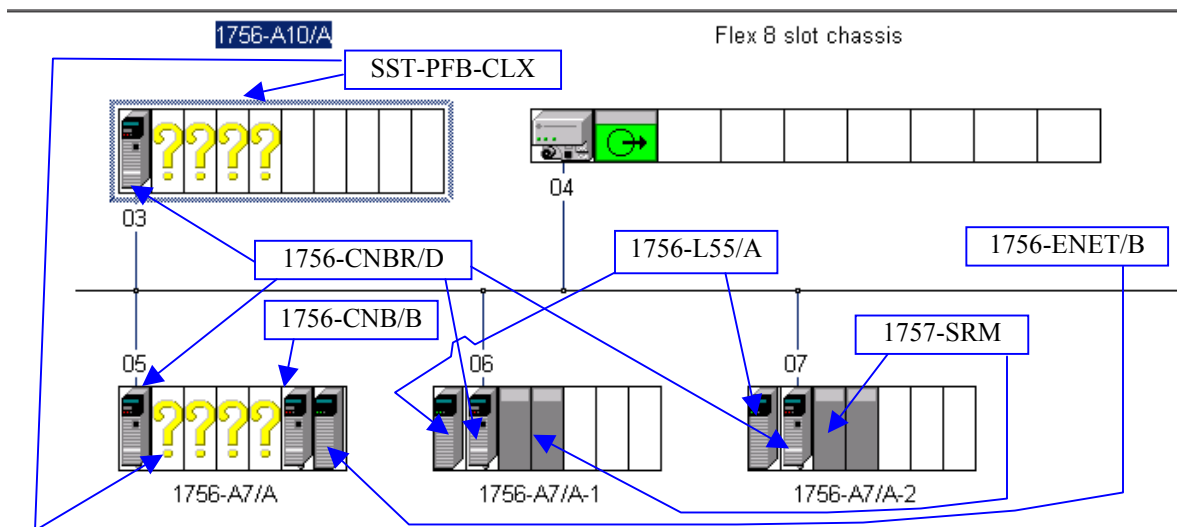
Software Output Switching Redundancy Solution vs. Hardware (1757-SRM) Solution:

According to document 1756Soft_HBU.pdf, Application Solution "Software Output System" (Publication number 1756-AP001A-US-E), it is possible to build a ControlLogix redundant system without the 1757-SRM modules, using ladder logic to switch control between CPUs.

> **Note**
>
> The test documented in this technical note is restricted to the hardware-based redundancy configuration, which requires the two 1757-SRM modules (as shown in Figure 1). As of this document's writing, there has been no known successful software-based redundant implementation for SST-PFB-CLX, nor has Woodhead claimed it possible to successfully implement software output switching redundancy with SST-PFB-CLX.

Summary of Test Results

From the tests performed, it was observed that the number of cards per remote ControlLogix rack, using one (1) ControlNet bridge, an SST RPI of 40 msec, a CN RPI of 10 msec and an NUT of 5 msec is:
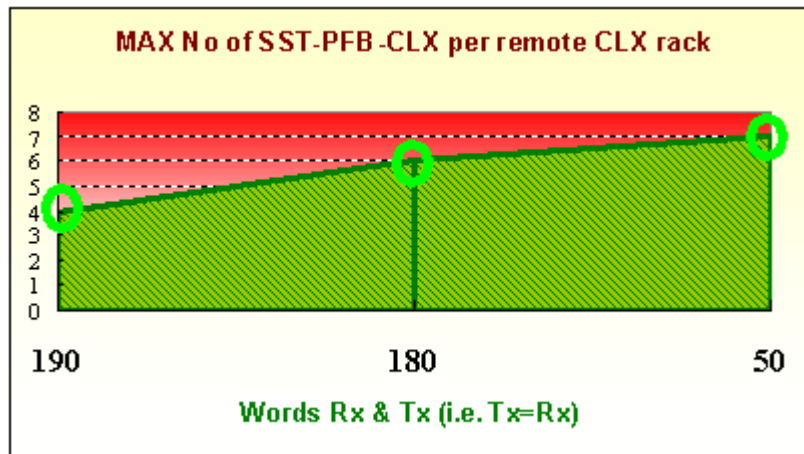
Detailed Test Results

Table 1:   Parameter Setting on SST-PFB-CLX Card for Largest Data Load (Tx=Rx=190 words)

Scan Cycle Times	Watchdog	Results	Remarks
20 x 100 usec	20 msec	Profibus comms. Failed	
40	40	Profibus comms. Failed	
60	60	Profibus comms. Failed	
80	80	Profibus comms. Failed	
100	100	No problem	

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Table 2:   RSLogix5000/RSNetworx Error Message Prompts

No. CN	No. SST	Input	Output	Config	Input Status	SST RPI*	CN RPI*	NUT	RSNetWorx error message
1	1	250	248	24	250	40	5	5	RSNetworx can't schedule
1	1	250	248	24	250	40	10	5	RSNetworx can't schedule
1	4	180	180	24	180	40	10	5	No problem
1	6	180	180	24	180	40	20	5	No problem
2	8	180	180	24	180	40	20	5	No problem
1	2	180	180	24	180	100	50	5	No problem
1	4	180	180	24	180	200	100	5	No problem
1	4	180	180	24	180	200	100	100	RSNetworx can't schedule
1	4	180	180	24	180	200	150	100	RSNetworx can't schedule
1	4	180	180	24	180	600	200	100	RSNetworx can't schedule
1	4	180	180	24	180	400	200	100	RSNetworx can't schedule
1	4	180	180	24	180	320	160	80	RSNetworx can't schedule
1	4	180	180	24	180	640	160	80	No problem
1	6	180	180	24	180	640	160	80	RSNetworx can't schedule
1	4	180	180	24	180	160	80	40	No problem
1	6	180	180	24	180	200	100	20	Failed
1	5	50	50	24	180	40	10	5	No problem
1	6	50	50	24	180	40	10	5	No problem
1	7	50	50	24	180	40	10	5	No problem
1	8	50	50	24	180	40	10	5	RSNetworx can't schedule
1	5	100	100	24	180	40	10	5	No problem
1	6	100	100	24	180	40	10	5	RSNetworx can't schedule
1	4	190	190	24	180	40	10	5	No problem
1	4	200	200	24	180	40	20	10	No problem (need to close and re-run the RsNetWorx, otherwise it will not work)
1	4	210	210	24	180	40	20	10	RSNetworx can't schedule

Table 3: Test Results for LED Display

No. CN	No. SST	Input	Output	Config	Input Status	SST RPI	CN RPI	NUT RPI	Comm LED	SYS LED	OK LED	LCD Display
1	1	180	180	24	180	40	10	5	SG	FG	SG	COPN
1	2	180	180	24	180	40	10	5	SG	FG	SG	COPN
1	4	180	180	24	180	40	10	5	SG	FG	SG	COPN
2	8	180	180	24	180	40	20	5	SG	FG	SG	COPN
1	5	50	50	24	180	40	10	5	SG	FG	SG	COPN
1	6	50	50	24	180	40	10	5	SG	FG	SG	COPN
1	7	50	50	24	180	40	10	5	SG	FG	SG	COPN
1	5	100	100	24	180	40	10	5	SG	FG	SG	COPN
1	4	190	190	24	180	40	10	5	SG	FG	SG	COPN

Table 4: Legend for Comments:

Title	Explanation
No. CN	# 1756-CNBR/D used
No. SST	# SST-PFB-CLX used
Input	Input (Words)
Output	Output (Words)
Input Status	Input Status (Words)
SST RPI	SST-PFB-CLX RPI values
CN RPI	1756-CNBR/D RPI values

Title	Explanation
SR	Solid Red
FR	Flashing Red
SG	Solid Green
FG	Flashing Green
SA	Solid Amber
FA	Flashing Amber
NUT	Network Update Time

Increasing the Number of SST-PFB-CLX Cards per Remote Rack

As shown in the previous section, it is possible to increase the number of SST-PFB-CLX cards by increasing the number of ControlNet bridges on the remote backplane. Whether this is practical is for the system's designer to decide.

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Network Interface

Technical Support

Technical support is available during regular business hours by telephone, fax or email from any Woodhead Software & Electronics office, or from www.mySST.com. Documentation and software updates are also available on the Web site.

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