

# SST-PB3S-CLX-RLL

## User Reference Guide

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# Preface

## Preface Sections:

- Purpose of this Guide
- Special Notation

## Purpose of this Guide

This manual is a user's guide for the SST ControlLogix (CLX) PROFIBUS slave module series, SST-PB3S-CLX-RLL, SST-PB3S-CLX-RLL-CC, SST-PB3S-CLXT-RLL and will be generically referred throughout this guide as the SST-PB3S-CLX-RLL. Use this guide if you are responsible for installing, programming or troubleshooting control systems that use Allen-Bradley CLX processors and the SST-PB3S-CLX-RLL slave module series. It is assumed that you have a basic understanding of PLCs and are familiar with PROFIBUS modules and the PROFIBUS network.

## Special Notation

The following special notations are used throughout this guide:



### Warning

Warning messages alert the reader to situations where personal injury may result. Warnings are accompanied by the symbol shown, and precede the topic to which they refer.



### Caution

Caution messages alert the reader to situations where equipment damage may result. Cautions are accompanied by the symbol shown, and precede the topic to which they refer.



### Note

A note provides additional information, emphasizes a point, or gives a tip for easier operation. Notes are accompanied by the symbol shown, and follow the text to which they refer.

# 1

## System Overview

### Chapter Sections:

- System Overview

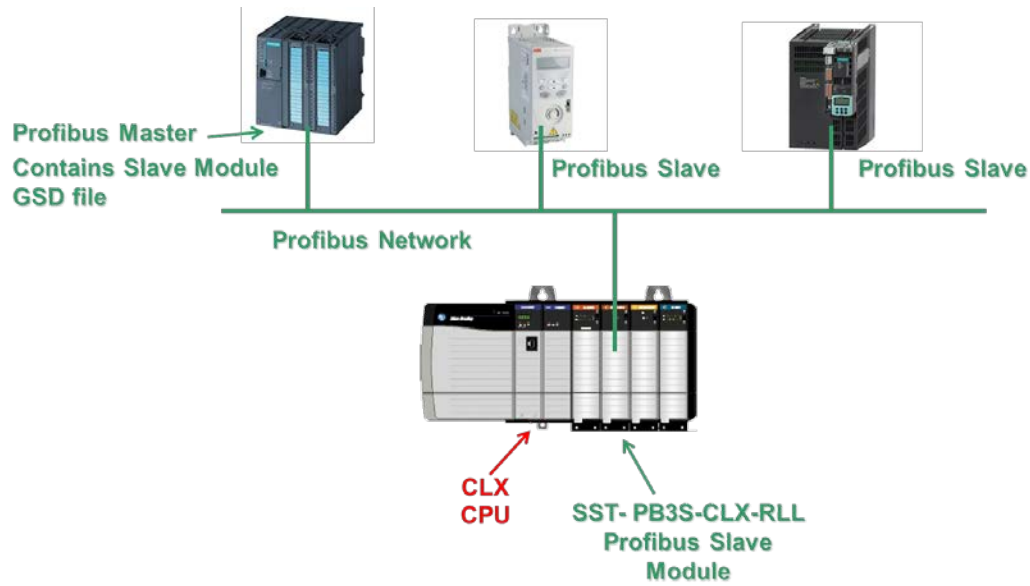
## 1.1 System Overview

### 1.1.1 Slave Capabilities

The SST-PB3S-CLX-RLL is a PROFIBUS slave-only interface for the 1756 (ControlLogix) backplane system. It enables communication between a CLX processor and Profibus slave device on a PROFIBUS network. The module:

- Supports standard ControlLogix or ControlLogix XT platforms
- Supports Rockwell's RSLogix 5000 Add-on-Profile (AOP)
- Supports a range of 1-122 words of input data and 1-122 words of output data per slave module for a maximum of 244 words data exchange
- Can reside in any slot in the local or remote CLX chassis.
- Supports all standard PROFIBUS baud rates (9600, 19200, 45.45k, 93.75k, 187.5k, 500k, 1.5M, 3M, 6M, 12M)
- Acts as a DP-V0 slave interface
- Supports: Profibus repeaters in the network, data swapping, Auto-Run mode, legacy device ID, diagnostic LEDs and front-of-module scrolling LCD display
- Does not require ladder logic in the CLX to transfer data or configuration setup
- Direct module swap-out for quick module replacement
- Can be a drop-in replacement for Legacy SST-PFB-CLX module that is only configured as a slave (using Profibus ID 0x0876)
- Slave configuration via the ControlLogix configuration file
- Slave configuration via AOP interface which updates the configuration file automatically





Slave Module Versions:



**SST-PB3S-CLX-RLL**  
Standard version



**SST-PB3S-CLX-RLL-CC**  
Conformal Coated  
version



**SST-PB3S-CLXT-RLL**  
eXTreme version

### 1.1.2 Operating Modes

The SST-PB3S-CLX operates in Asynchronous Mode to backplane RPI (Requested Packet Interval).



# 2

## Hardware Overview

### Chapter Sections:

- Hardware Features

## 2.1 Hardware Features

The slave's hardware features are shown below. The LCD displays the firmware version at power up, and connection status and errors during operation. The three LEDs (COMM, SYS and OK) display PROFIBUS and module behavior. For more detailed information on LEDs, refer to Section 4.3, [PROFIBUS LED and Display States](#).

Figure 1: Hardware Features

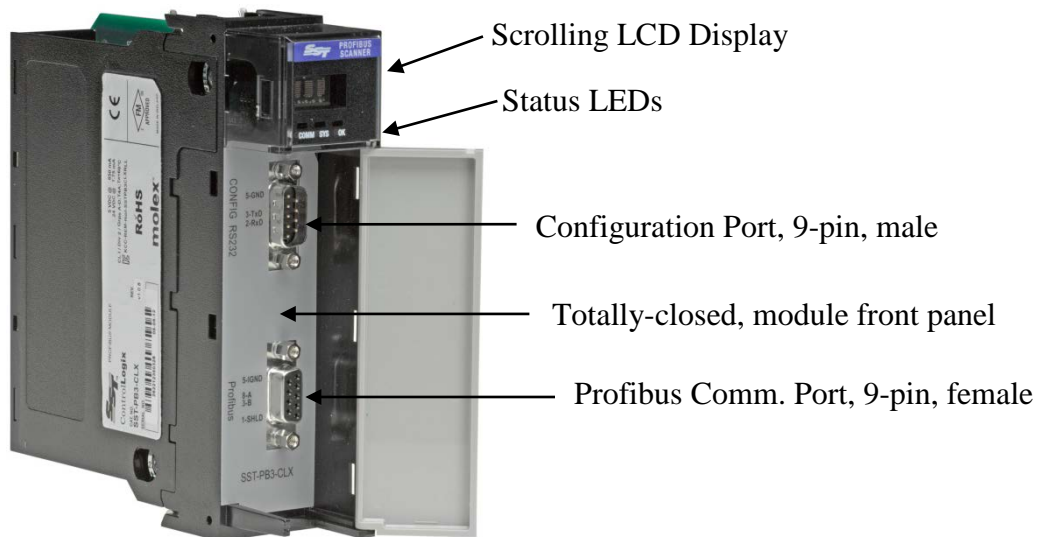


Table 1: Description of Features

Feature	Description
Status LEDs	Display the communication and system status
Front panel	Identifies the device, ports and protects internal electronic components from dust, contaminants and possible damage
9-pin PROFIBUS Connector	For connection to the PROFIBUS network
Self-locking tabs	Secure the slave in the chassis slot
Side label (nameplate)	Provides module information
Display	CLX Connection status faults, operation status
Configuration port	For upgrading module firmware

### 2.1.1 Status LEDs

There are three LEDs on the module, the COMM LED, SYS LED and the OK LED. For detailed information, refer to Section 4.3, [PROFIBUS LED and Display States](#).

#### COMM LED

The COMM LED remains off while the slave is online and operating correctly. The only time this LED remains RED is when a fatal error occurs. The COMM and SYS LED will go red at the same time to indicate an unrecoverable fatal error.

#### SYS LED

The SYS LED indicates the communication status with the PROFIBUS Slave. When the SYS LED is solid red, the PROFIBUS Slave is no longer being scanned by a DP Master, and when it is solid green, the PROFIBUS Slave is successfully being scanned by a DP Master in Run mode. An amber SYS LED indicates that the PROFIBUS Slave is being successfully scanned by a DP Master that is in Clear mode.

#### OK LED

The OK LED indicates that initialization is complete and that the module is OK.

### 2.1.2 9-Pin PROFIBUS Connector

The 9-pin PROFIBUS Connector connects the slave to the PROFIBUS network.

### 2.1.3 Configuration Port

Use the configuration port to upgrade module's firmware.



# 3

## Quick Start

### Chapter Sections:

- Purpose
- Equipment and Tools
- Package Contents
- Power Requirements
- Procedures

## 3.1 Purpose

Although this section does not include detailed information in its procedures, other chapters are referenced where more information is available. These procedures are written with the assumption that you have a basic understanding of process control and are fully able to interpret the ladder logic instructions that control the applications.

## 3.2 Equipment and Tools

Have the following tools and equipment ready:

- Computer containing Rockwell Automation RS-Logix5000 or Studio 5000 software with Molex SST Add On Profiles
- Cable to connect computer to CLX system
- SST-PB3S-CLX-RLL slave module
- SST-PB3S-CLX-RLL slave GSD file (ssti0EC7.gse). This can be found on the Product CD at location CD:\Product Files\SST-PB3S-CLX-RLL\GSD
- SST-PB3S-CLX-RLL ladder samples (sstpb3sclx\_generic\_profile\_sample.acd (For Generic Profile), sstpb3sclx\_AOP\_sample.acd (For Add-On-Profile). These samples can be accessed from selecting the SST-PB3S-CLX-RLL product from product CD and moved to PC.
- PROFIBUS cable to connect the slave module to the PROFIBUS network

## 3.3 Package Contents

Unpack the SST-PB3S-CLX-RLL slave module. Make sure that the contents include:

- PROFIBUS slave
- PDF version of this manual included on the CD
- CD with files for Windows XP/Server 2003 32-bit installation and Windows Vista/Server 2008/Windows 7/Windows 8 32-bit and 64-bit installations



## 3.4 Power Requirements

Review your system's power requirements to see that your chassis supports placement of the SST-PB3S-CLX-RLL module.



### Note

The module consumes 850 mA @ 5VDC, 1.75 mA @ 24VDC.

For modular systems, calculate the total load on the system power supply using the procedure described in the CLX 5000 Modular Style Installation & Operation Manual, Allen-Bradley Publication 1747-6.2

## 3.5 Procedures

The setup of the SST-PB3S-CLX-RLL slave is divided into two parts:

- Setting up the slave module
- Getting the slave running

### 3.5.1 Setting up the Slave Module

The following steps describe the SST-PB3S-CLX-RLL setup procedure:



### Warning

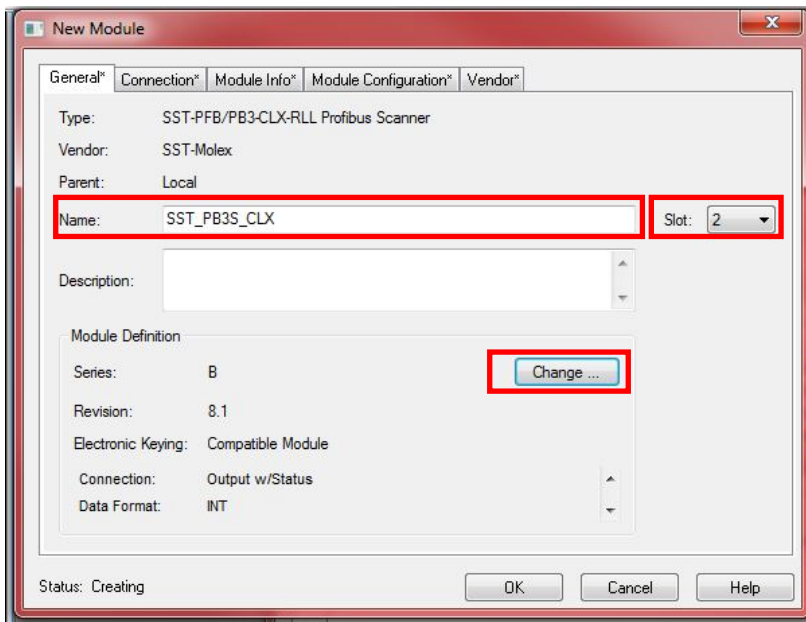
If installing the module while the chassis is powered up, make sure the environment is free of explosive or hazardous dusts or gases. If there is a possibility of gases present, remove the hazardous dusts or gases, and power down the chassis before installing the module. Serious injury or damage to equipment may result if this warning is not followed.

1. Insert the slave module into your 1756 CLX chassis.
2. Connect the slave to the PROFIBUS network using the appropriate cabling and termination. Refer to Section 4.2, [PROFIBUS Wiring](#), for more detailed information.
3. Apply power to the CLX provided it is safe to do so.
4. Put the CLX PLC in Program mode. See your programming software manuals for details.

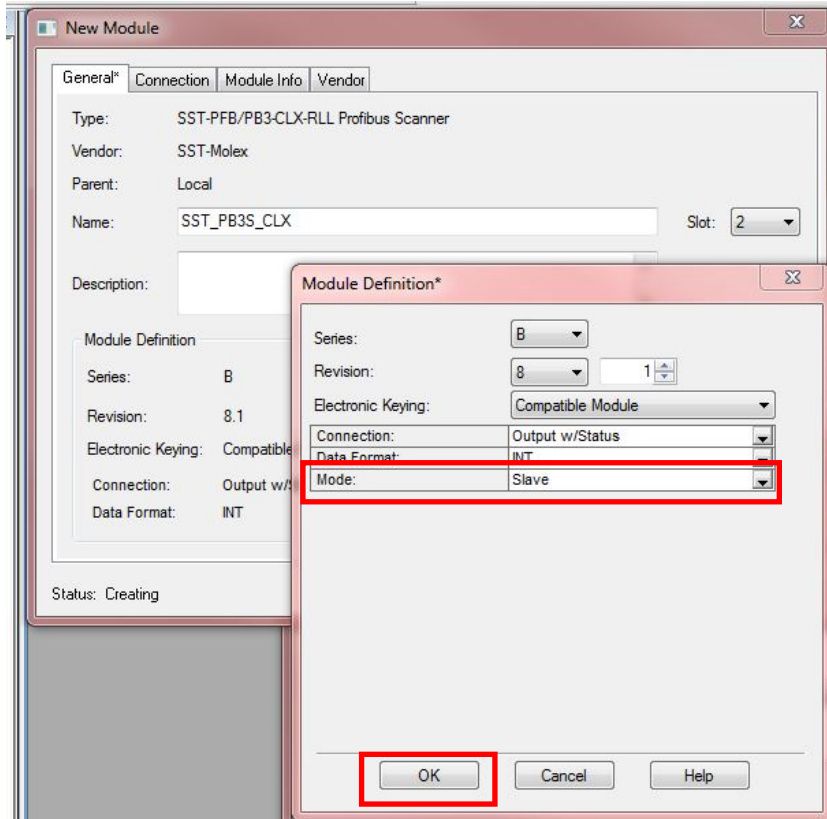
### 3.5.2 Getting the Slave Module Running

The following steps describe how to set up the SST-PB3S-CLX-RLL:

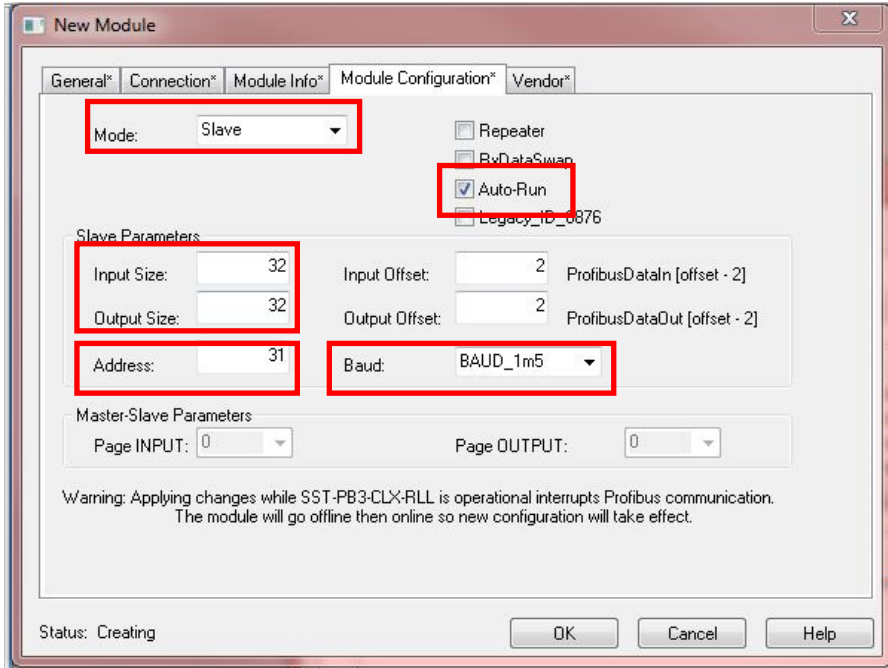
1. Launch RSLogix5000 or Studio 5000 software.
2. Select I/O Configuration folder, select New Module, select Moxel Incorporated in Module Type Vendor Filters, select SST-PB3-CLX-RLL, and select Create button.
3. In General Tab, fill in the Name field, select module slot number in the chassis. In the Module Definition area, select Change button



4. In the Module Definition Window, select Slave in the Mode menu, then select OK.



5. In the Module Configuration Tab, select Slave in Mode drop-down, select Auto-Run, fill in slave data transfer sizes, Profibus slave station number (Address), Profibus Baud rate, select OK. See section [6.5.2](#) for more details on the parameters that need setting as indicated in red below.



# 4

## Installing the SST-PB3S-CLX-RLL Slave

### Chapter Sections:

- Installing the Slave Module
- PROFIBUS Wiring
- PROFIBUS LED and Display States
- LED and Display combinations

## 4.1 Installing the Slave Module

### 4.1.1 Installation Procedure

The following procedure describes how to install the slave module:



#### Warning

If installing the module while the chassis is powered up, make sure the environment is free of explosive or hazardous dusts or gases. If there is a possibility of gases present, remove the hazardous dusts or gases, and power down the chassis before installing the module. Serious injury or damage to equipment may result if this warning is not followed.

1. You can, but do not necessarily need to disconnect the power, as the slave supports insertion under power. Read and follow the Warning described above.
2. Using the chassis card guides, align the full-sized circuit board.
3. Slide the module into the chassis until the top and bottom latches catch.
4. Attach the PROFIBUS cable.
5. Turn on connector termination as required.
6. Route the cable down and away from the slave.

### 4.1.2 Removal Procedure

The following procedure describes how to uninstall the slave module:



#### Warning

If removing the module while the chassis is powered up, make sure the environment is free of explosive or hazardous dusts or gases. If there is a possibility of gases present, remove the hazardous dusts or gases, and power down the chassis before removing the module. Serious injury or damage to equipment may result if this warning is not followed.

1. You can, but do not necessarily need to disconnect the power, as the slave supports removal under power. Read and follow the Warning described above.
2. Remove all cabling from the slave.
3. Press releases at the top and bottom of the module and slide the module out of the slot.

## 4.2 PROFIBUS Wiring

The module contains a standard DB9 connector, which can be connected to a PROFIBUS bus terminal. The module has no built-in termination. If you require termination, you can use a Bus terminal that has built-in selectable termination.

Table 2: DB9 Instructions

Pin #	Pin Description	DB9 Line * Termination When Using the SST-PB3S-CLX-RLL
1	Chassis ground	
2	Reserved	
3	Data +	Connect this pin to pin 8 (data -) with 220 ohm resistor
4	TX Enable	
5	Isolated ground	Connect this pin to pin 8 (data -) with 390 ohm resistor
6	Isolated +5V	Connect this pin to pin 3 (data +) with 390 ohm resistor
7	Reserved	
8	Data -	
9	Reserved	

\* For line A cable (135-165 ohm impedance)



### Caution

Do not connect devices to the +5V line. It is there for termination purposes only.

## 4.2.1 Selecting the Proper Line Type

Use this table to determine which line type best suits your system requirements.

Table 3: Line Types

Baud Rate (Bits/s)	Line A Distance (Max)	Line B Distance (Max)	Register Value
9k6, 19.2k, 45.45 k and 93.75k	1200 m**	1200 m**	0, 1, 11, 2
187.5k	1000 m**	600 m**	3
500k	400 m**	200 m**	4
1.5M	200 m**	NA	6
3, 6 and 12M	100 m**	NA	7, 8, 9
NA = Not Applicable *If using a combination of both line types, divide the lengths shown by two. **This is the sum of all bus segment and drop cable lengths.			



### Note

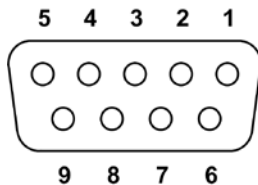
The two physical ends of the PROFIBUS network should be terminated. There should be only two terminators on a network.



## 4.2.2 PROFIBUS Connector

The card has one standard PROFIBUS DB9 female connector per channel. Pin numbers are identified in the following figure.

Figure 2: The PROFIBUS DB9 Female Connector



### Note

The recommended male connector is the Brad Harrison PA9D01-42 Diagnostic D-Sub Connector.

The recommended cable is a Belden3079A. Examples include:

- Brad Harrison 85-001 PVR2 conductor with shield, UL-listed PROFIBUS cable
- Bosch Comnet DP #913 548 Flexible PROFIBUS cable
- Bosch Comnet DP #917 201 Trailing PROFIBUS cable
- Bosch Comnet DP #917 202 Massive PROFIBUS cable



### Note

Allen Bradley blue hose, which has an impedance of 78 ohms, is not recommended.

## 4.3 PROFIBUS LED and Display States

The following tables show how the LEDs and the display work together to provide detailed information on the operation of the slave.

Table 4: COM LED Behavior

LED State	Description
Solid Red	A recoverable or unrecoverable fatal error has occurred when COMM and SYS LED are solid red at the same time.
Off	The Profibus slave is in offline or online state.
Flashing RED	This may occur when putting the Profibus Slave online but the COMM LED should then go off and remain off after going online.

Table 5: OK LED Behavior

LED State	Description
Solid Green	Initialization is complete and module is ready
Solid Red	Hardware error

Table 6: SYS LED Behavior

LED State	Description
Solid Green	The Profibus slave is being scanned by a DP Master in RUN mode.
Solid Red	The Profibus slave is online but is not being scanned by a DP Master
Amber	The Profibus slave is online and being scanned by a DP Master in CLEAR mode.
Off	The Profibus slave is offline.







### Note

The COMM LED is always off while the slave is operational.

## 4.4 LED and Display Combinations

While a connection is open, COPN shows on the LCD Display. From left to right, the LEDs are COMM, SYS and OK. The COM LED may go RED when the slave is first put online but then it will remain off while the card is online.

Table 7: LED and Display Combinations

COPN State	Description
 <p>OK LED green and SYS LED is amber.</p>	Card is online and being scanned in CLEAR mode by DP Master and the connection is open.
 <p>OK LED is green and COMM and SYS are off.</p>	Card is offline and the connection is open.
 <p>SYS and OK LEDs are green. COMM is off.</p>	Card is online and being scanned in RUN mode by a DP Master and the connection is open
 <p>COMM is Off. SYS LED is red and OK LED is GREEN.</p>	Card is online and is not being scanned by a DP Master.

## 4.5.1 Display Tables

The following table shows scrolling LCD display information and descriptions:

Table 8: SST-PB3S-CLX-RLL Display

Display	Meaning/Description
Ver x.xx	Power up message. This message appears briefly during power up. x.xx is the firmware version.
Invalid Serial Number	The serial number has not yet been programmed on this module.
CLX INIT FALT 0xYY	ControlLogix Initialization fault. The ControlLogix Backplane startup routines failed, with failure code YY (hex).
CONNCLSD	There are no open ControlLogix Backplane connections.
NVLD XMIT SIZE	Invalid transmit size. The size of the transmitted data for a new connection does not match that of an existing connection.
NVLD OUT CNPT	Invalid output connection point.
NVLD RCV SIZE	Invalid receive size. The size of the received data for the connection is invalid.
NVLD RCV BUFF	Invalid receive buffer. Failed to allocate a receive buffer. This should never happen.
CONN BLKED	Connections blocked (not allowed). The Connection Manager is in a Connections not allowed state. This should never happen.
DUPLCONN DTCT	Duplicate connection detected. Connection is already open.
RSRC ERR1 INCM	Resource error # 1 in Connection Manager: Out of memory. This should never happen.
NVLD FWD OPEN	Invalid forward open. CM was unable to parse the Forward open. May be a key segment mismatch.
NVLD SRVC CODE	Invalid service code. Service code in CLX Forward Open was invalid.
WDOG	Watchdog timeout. The module watchdog has timed out.
OFPT	Slave firmware operational fault.
Backplane OK	SST-PB3S-CLX-RLL resides in the rack that is powered on but not configured in the CLX Controller.
Booting	SST-PB3S-CLX-RLL is just powering up and initializing.
COPN	Connection open.
MULT	Multiple processors are attempting to connect to the slave.
IDMSM	There is a Profibus Slave ID Mismatch. The DP Master is trying to configure module with wrong Slave ID



### Note

The default LCD display is COPN when the slave is working correctly.

# 5

## System Diagnostics

### Chapter Sections:

- PB3S Status Register
- Slave Firmware Version
- Diagnostic Counters

## 5.1 PB3S Status Register

### Local:Slot:S.Data[0] , AOP Tag Local:Slot:S.PfbStatus

The first 16-bit INT in the Status area is the Card Status register. The following tables show possible status register values.

Table 9: PfbStatus

Status Name	Meaning/Description	Value
STS_NO_ERROR	The SST-PB3S-CLX-RLL has no errors	0x0000
STS_BAD_BAUD	The configured baud rate is not valid	0x0002
STS_BAD_STN_ADR	The configured station address is not valid	0x0003
STS_BAD_HI_STN_ADR	The configured Highest Station Address is not valid	0x0004
STS_CFG_INTERNAL_ERROR	The SST-PB3S-CLX-RLL has encountered a fatal internal error	0x0080
STS_OUT_OF_APBS	The SST-PB3S-CLX-RLL has run out of internal resources	0x0081
STS_HEAP_ALLOC_FAIL	The SST-PB3S-CLX-RLL has run out of internal resources	0x0083
STS_SH_HEAP_ALLOC_FAIL	The SST-PB3S-CLX-RLL has run out of internal resources	0x0084

If the status register contains STS\_CFG\_INTERNAL\_ERROR (80h), there has been an internal error on the slave. Record the contents of the ErrInternal and errArg registers and contact [Technical Support](#). ErrInternal is stored in the high byte of status area offset 24. ErrArg is stored in the low byte of status area offset 25.

If the status register contains STS\_HEAP\_ALLOC\_FAIL (83h) or STS\_SH\_HEAP\_ALLOC\_FAIL (84h), there has been an internal error in allocating memory. Contact [Technical Support](#).

## 5.2 Slave Firmware Version

The version number of the slave firmware is stored in status area offset 1. For example, if the Word corresponding to the value is 0800h, then the firmware is version 8.00.

## 5.3 Diagnostic Counters

Table 10: Description of Diagnostic Counters

Name	Location	Meaning/Description
DiagInd	Local:Slot:S.Data[07]	Total indications

The DiagInd counter, register Local:Slot:S.Data[07], counts total indications, that is, unsolicited messages to this station





# 6

## Slave Functionality

### Chapter Sections:

- Slave I/O Interface
- Register Definitions and Layout
- I/O Table Additions/Modifications
- Config Table Additions
- Slave Configuration and Programming

## 6.1 Slave I/O interface

Specifically, the I/O interface consists of the following areas:

### 6.1.2 Interface Image for Add-On-Profile

Table 11: ControlLogix Slave Interface Image for Add-On-Profile

Area Description	Area Layout	Meaning/Description	Size
Output Area	CMD Control Register Local:Slot:O.ModuleControl.CMD_Cntrl	Issue a command to slave See <a href="#">Command Control Register</a> for more details.	1 x 8 bits
	Change Page Register Local:Slot:O.ModuleControl.ChangePage	Not applicable. Leave at 0.	1 x 8 bits
	CMD Argument Local:Slot:O.ModuleControl.CMD_Argument	See <a href="#">Command Argument Register</a> below for all available commands.	1 x 8 bits
	CMD_Additional_Parameter Local:Slot:O.ModuleControl.CMD_Additional_Parameter	Not Applicable. Leave at 0.	1 x 8 bits
	Output Data Area Local:Slot:O.ProfibusDataOut [0] to Local:Slot:O.ProfibusDataOut [121]	For AOP, PROFIBUS output data starts at tag ProfibusDataOut[0]. Note: ProfibusDataOut[122] – [247] are not used.	246 x 16 bits
Input Data Area	Module Status register Local:Slot:I.ModuleStat.ModuleStatus	See <a href="#">Module Status Register</a> below for more details.	1 x 8 bits
	Current page Register Local::Slot:I:.ModuleStat.CurrentPage	This should always be 0.	1 x 8 bits
	Module Cmd Reply register Local:Slot:I.ModuleStat.CMD_Reply	Echo of CMD Argument above See <a href="#">Command Reply Register</a> for more details.	1 x 8 bits
	Reserved	Reserved - Do not use	1 x 8 bits
	Input Data Area Local:Slot:I.ProfibusDataIn[0] to Local:Slot:I.ProfibusDataIn [121]	PROFIBUS input area starts at Tag ProfibusDataIn[0]. Note: ProfibusDataIn[122] – [247] are not used	248 x 16 bits
Status Area Applicable registers to Slave mode are only noted here. Other registers in status file do not apply.	Card Status Register PfbStatus	Indicates the card's status See <a href="#">Card Status Register</a> for more details.	1 x 16 bits

Area Description	Area Layout	Meaning/Description	Size
	Profibus Firmware Version PfbModVer	Indicates Profibus firmware version	1 x 16 bits
AOP Tags between PfbModVer and ReconfigStatus do not apply to this module			
	Reconfiguration Status ReconfigStatus	Status of Reconfig message that is sent when applying configuration change while a connection is open to module in RSLogix 5000.	1 x 8 Bits
AOP Tags between ReconfigStatus and DiagInd do not apply to this module			
	Diagnostic Indications DiagInd	Indicates module is getting updates from Profibus network	1 x 16 Bits
AOP Tags between DiagInd and SlvStatus do not apply to this module			
	SlvStatus	Local slave status register See <a href="#">Slave Status</a> below for more details	1 x 8 Bits
	SlvError	Local slave error register that contains error code. See <a href="#">Slave Error Codes</a> below for more details.	1 x 8 Bits
Remaining AOP tags do not apply to this module			

### 6.1.3 Interface Image for Generic Profile

Table 12: ControlLogix Slave Interface Image (for Generic Profile using INT Data type)

Area Description	Area Layout	Meaning/Description	Size
Output Area	CMD Control Register (low byte) Local:Slot:O.Data[0]	Issue a command to slave See <a href="#">Command Control Register</a> for more details.	16 bits
	CMD Argument (low byte) Local:Slot:O.Data[1]	See <a href="#">Command Argument Register</a> below for all available commands.	16 bits
	Output Data Area Local:Slot:O.Data[2] to Local:Slot:O.Data[123]	PROFIBUS output data starts at word offset 2.	122 x 16 bits
Input Data Area	Module Status register (bits 0 -7) Local:Slot:I.Data[0]	See <a href="#">Module Status Register</a> below for more details.	16 bits
	Module Cmd Reply register Local:Slot:I.Data[1]	Echo of CMD Argument above See <a href="#">Command Reply Register</a> for more details.	16 bits
	Input Data Area Local:Slot:I.ProfibusDataIn[2] to Local:Slot:I.ProfibusDataIn [123]	PROFIBUS input area starts at word offset 2.	122 x 16 bits
Status Area	Card Status Register (Local:Slot:S.Data[0])	Indicates the card's status See <a href="#">Card Status Register</a> for more details	1 x 16 bits
	Profibus Module Version (Local:Slot:S.Data[1])	Indicates Profibus firmware version	1 x 16 bits
	Diagnostic Indications (Local:Slot:S.Data [07])	Indicates module is getting updates from Profibus network	1 x 16 Bits

Area Description	Area Layout	Meaning/Description	Size
	Reconfiguration Status (Local:Slot:S.Data[4].8-15)	Status of Reconfig message that is sent when applying configuration change while a connection is open to module in RSLogix 5000.	1 x 8 Bits
	Slave status (Local: Slot:S.Data [44].00-07)	Local slave status register See <a href="#">Slave Status</a> below for more details	1 x 8 Bits
	Slave Error (Local: Slot:S.Data [44].08-15)	Local slave error register that contains error code. See <a href="#">Slave Error Codes</a> below for more details.	1 x 8 Bits

Table 13: CMD Control Register  
(Local:Slot:O.Data[0], AOP Tag Local:Slot:O.ModuleControl.CMD\_Control)

Value, Hex	Meaning/Description
00	No Command in CMD Argument register
01	Issue the command that is in the CMD Argument register

Table 14: CMD Argument Register  
(Local:Slot:O.Data[1].0 – 7, AOP Tag Local:Slot:O.ModuleControl.CMD\_Argument )

Value, Hex	Meaning/Description
00	No Command
03	PFB_CLR_ERR_CNT- Clear counters in Status area
04	PFB_ONLINE- Put slave online with PROFIBUS bus
07	PFB_OFFLINE - Put slave offline with the PROFIBUS bus

Table 15: Module Status Register  
(Local:Slot:I.Data[0].0 -7, AOP Tag Local:Slot:I.ModuleStat.ModuleStatus)

Value, Hex	Meaning/Description
E0	Slave is not online with PROFIBUS bus. Issue the PFB_START_BUS command to put it online.
E1	Slave is online with the PROFIBUS bus.
FF	The CLX processor has lost its connection to the slave module. All data in the Input and Status tables should be considered invalid.



## Caution

The Module Status Register should be monitored for 0xFF in ladder code. If this condition occurs, the processor has lost the connection to the slave and should assume a safe state.

Table 16: CMD Reply Register  
(Local:Slot:I.Data[1], AOP Tag Local:Slot:I.ModuleStat.CMD\_Reply)

Value, Hex	Meaning/Description
00	No Command
03	PFB_CLR_ERR_CNT has been processed
04	PFB_ONLINE has been processed
07	PFB_OFFLINE has been processed

## 6.2 Register Definitions and Layout

### 6.2.1 DP Slave Status Table Entries

The following table shows the additions to the CLX status file to support the DP slave functionality:

Table 17: Additions to CLX File That Support DP Slave Functionality

Name	Location	AOP Tag Name	Meaning/Description
DP slave status and error register	Local:Slot:S.Data[44]	SlvStatus, SlvError	Returns DP slave status and error information to the CLX processor. Status byte -> bits 0-7. Error byte -> bits 8-15.



## Note

The above table assumes that the slave is configured as a 16-bit device in RSLogix5000.

Table 18: DP Slave Status and Error Register

Name	Location	AOP Tag Name	Meaning/Description
DP slave status bit 0 - 5	Local:Slot:S:Data[44].0 - 5	None	Reserved for future use
DP slave status SLV_STS_RUN_MODE bit	Local:Slot:S:Data[44].6	SlvStsRunMode	Set to True if the slave is being scanned by a remote master in "RUN" mode.
DP slave status SLV_STS_OK bit	Local:Slot:S:Data[44].7	SlvStatusOk	Set to True if the current slave status is OK. This means parameterization was successful and the slave watchdog has not timed out.
DP slave error byte	Local:Slot:S:Data[44].8-15	SlvError	The slave sets the error byte to report various error conditions. If there are multiple errors, the register contains the value of the last error encountered.

Table 19: DP Slave Error Byte  
(Local:Slot:S:Data[44].8-15, AOP tag Local:Slot.S.SlvError)

Value	Error	Meaning/Description
01h	SLV_ERR_ID_MISM	Slave ID does not match the slave ID configured in the master. If there is a mismatch, the slave won't communicate with the master.
02h	SLV_ERR_READY_TIME_MISM	Ready time for the card is different from the value configured in the master. The card can communicate as a slave even if the times are different, but you may experience network errors.
03h	SLV_ERR_UNSUP_REQ	Master has requested Sync or Freeze during parameterization, which the card does not support.
04h	SLV_ERR_RX_LEN_MISM	Data received from the master has a length different from the length configured on the card. If there is a receive length mismatch, the card won't communicate as a slave.
05h	SLV_ERR_TX_LEN_MISM	Master has requested data from the slave with a length different from the length configured for the slave. If there is a transmit length mismatch, the card won't communicate as a slave.
06h	SLV_ERR_WD_FACT_INV	One of the two slave watchdog factors is zero, which is not allowed.
07h	SLV_ERR_TIME_OUT	Slave's watchdog timed out. The slave goes offline and must be reinitialized by the master.
08h	SLV_ERR_WARN_WD_DIS	Master has disabled the slave watchdog.



## Note

All errors (except SLV\_ERR\_TIME\_OUT) occur when the slave is being parameterized by the master.

## 6.3 I/O Table Additions/Modifications



### Note

If you are using AOP to configure module as a slave, you do not have to edit the CLX configuration table manually. Editing the CLX configuration table is only required when using Generic 1756 Module Profile.

Received data is data received from the remote master. This data is mapped into the CLX input table starting at word offset 2. Transmit data is data that the slave module sends to the remote master. This data is mapped into the CLX output table starting at word offset 2.

## 6.4 Config Table Additions

The CLX config table will be used to configure the slave functionality. If using Rockwell's AOP to do the configuration, see section 6.5.2, [Configuring the CLX Slave in RSLogix 5000 using Add-on-Profile \(AOP\)](#).

The slave config file entries start at 10H (16D).



### Note

The CLX config file is always configured as byte locations. The CLX config file must be set to at least 24 bytes in size for Slave-only Mode.

The following table shows the additions to the CLX config table that support the DP slave functionality:

Table 20: Additions to CLX Config Table Supporting DP Slave Functionality

Name	Location	Meaning/Description																						
AUTORUN	Local:Slot:C:Data[1]	If 2, the module comes online automatically after powerup and enters the mode that the CLX processors is in (RUN or PROG)																						
ScannerConfig	Local:Slot:C:Data[16]	This register configures enables the slave mode. See the ScannerConfig Register table (follows this table).																						
SlvRxLen	Local:Slot:C:Data[17]	The length of slave receive data (in words)																						
SlvTxLen	Local:Slot:C:Data[18]	The length of slave transmit data (in words)																						
SlvRxOffset	Local:Slot:C:Data[19]	If 0, the DP slave Rx data will be mapped into the CLX Input file at word offset 2.If set to a non-zero value, it specifies the word offset into the CLX Input file where the slave Rx data should be mapped.																						
SlvTxOffset	Local:Slot:C:Data[20]	If 0, the DP slave Tx data will be mapped into the CLX Output file at word offset 2. If set to a non-zero value, it specifies the word offset into the CLX Output file where the slave Tx data should be mapped.																						
LocStn	Local:Slot:C:Data[21]	"LocStn" defines the Slave's local station number. The valid range is 1-125.																						
Baud	Local:Slot:C:Data[22]	"Baud" defines the slave's baud rate. The following table defines the valid PFB network rates and the corresponding value that is written into the Baud register.  <table border="1"> <thead> <tr> <th>BAUD Rate</th> <th>Register Value</th> </tr> </thead> <tbody> <tr> <td>BAUD_9k6</td> <td>0</td> </tr> <tr> <td>BAUD_19k2</td> <td>1</td> </tr> <tr> <td>BAUD_93k75</td> <td>2</td> </tr> <tr> <td>BAUD_187k5</td> <td>3</td> </tr> <tr> <td>BAUD_500k</td> <td>4</td> </tr> <tr> <td>BAUD_1m5</td> <td>6</td> </tr> <tr> <td>BAUD_3m</td> <td>7</td> </tr> <tr> <td>BAUD_6m</td> <td>8</td> </tr> <tr> <td>BAUD_12m</td> <td>9</td> </tr> <tr> <td>BAUD_45k45</td> <td>11</td> </tr> </tbody> </table>	BAUD Rate	Register Value	BAUD_9k6	0	BAUD_19k2	1	BAUD_93k75	2	BAUD_187k5	3	BAUD_500k	4	BAUD_1m5	6	BAUD_3m	7	BAUD_6m	8	BAUD_12m	9	BAUD_45k45	11
BAUD Rate	Register Value																							
BAUD_9k6	0																							
BAUD_19k2	1																							
BAUD_93k75	2																							
BAUD_187k5	3																							
BAUD_500k	4																							
BAUD_1m5	6																							
BAUD_3m	7																							
BAUD_6m	8																							
BAUD_12m	9																							
BAUD_45k45	11																							
Reptr	Local:Slot:C:Data[23]	This option does not apply to the slave only module and can be left at 0.																						

Table 21: AUTORUN / LEGACY\_ID\_0876 Register (Local:Slot:C:Data[1].1)

Name	Location	Meaning/Description
LEGACY_ID_0876	Local:Slot:C:Data[1].0	If set, Profibus ID 0x0876 will be used instead of 0x0EC7 for backward compatibility.
AUTORUN	Local:Slot:C:Data[1].1	If set, AUTORUN is enabled. The Slave will come online automatically after powerup.



Table 22: ScannerConfig Register (Local:Slot:C:Data[16])

Name	Location	Meaning/Description
SlvEna	Local:Slot:C:Data[16].0	Has to be set to 1. The DP slave functionality is enabled
MasDisAbl	Local:Slot:C:Data[16].1	Has to be set to 1 along with SlvEna bit being set to 1.
Rx Data Swap	Local:Slot:C:Data[16].2	If Set, Slave Rx Data (from Master) will get swapped prior to copying to ControlLogix input table
Reserved	Local:Slot:C:Data[16].3-7	Reserved

## 6.5 Slave Configuration and Programming

The CLX slave accepts the ControlLogix configuration only once after a connection is made to module. This means if you change the ControlLogix configuration file settings (Station number, baud rate and so on) in your RSLogix 5000 Program and download it to the ControlLogix PLC while the CLX slave is online, the new settings will not take effect. The recommended configuration method is to use AOP (Add-On-Profile). AOP allows quick reconfiguration of CLX slave while PLC is in RUN mode.

There are three ways to have the new configuration settings accepted:

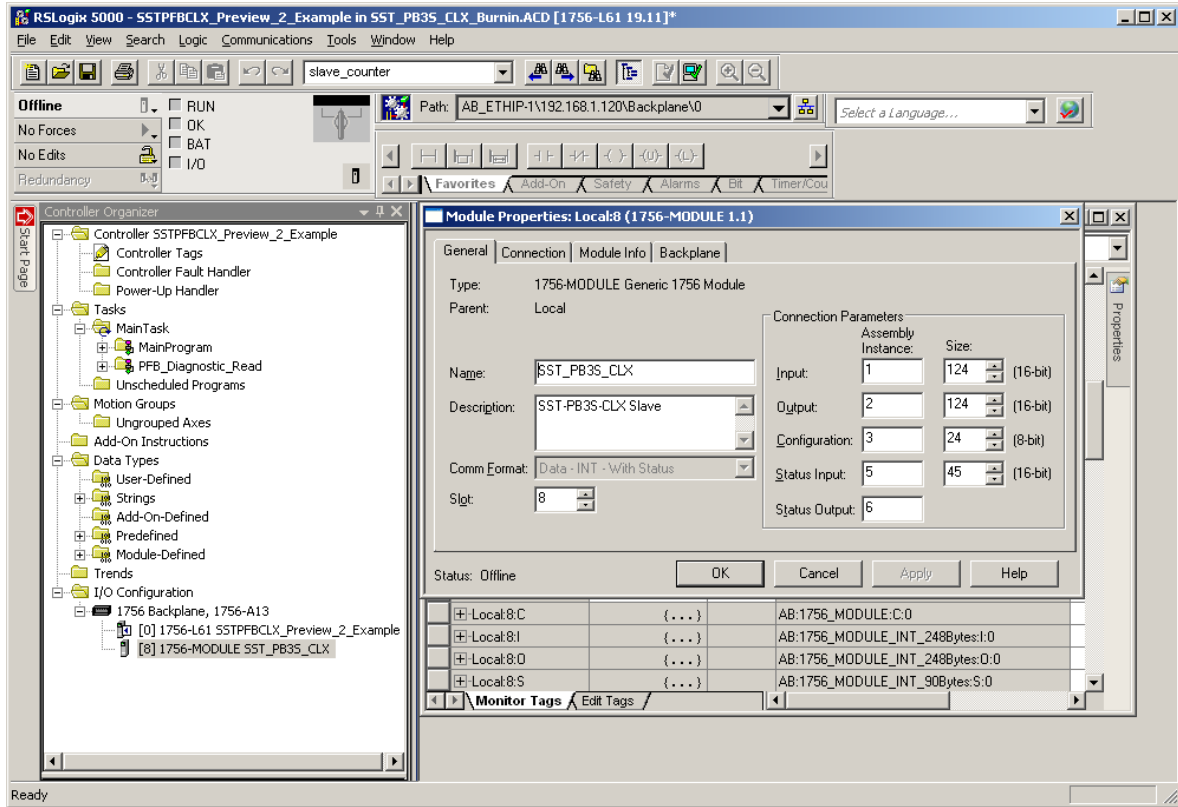
1. Cycle power on the module before new configuration settings are accepted. This can be done by removing and reinserting module into rack while rack is powered. This method can be used if other modules in rack need to remain powered on.
2. If using AOP and while online with PLC in RUN mode with AUTORUN enabled for the CLX slave, the apply button can be clicked on after making changes in the Module configuration window. This will force the module to go offline and back online to use the new configuration settings.

3. If using Generic profile (1756-Module) and while online with PLC in RUN mode do the following steps:
  - a. Change the slave parameters in the configuration assembly (Local:Slot:C.Data[0 – 23]). These changes should be saved in the offline project. Resave the project to upload tag values or go offline and make the same changes.
  - b. While online, inhibit the sample program for our module so that the code does not try to put our module back online after its taken offline.
  - c. Write the offline command (0x07) to module by writing 0x07 to Local:Slot:O:2.Data[1].
  - d. Set Local:Slot:O.Data[0] to 0x01 to trigger the command .
  - e. Wait for the Module status register (Local:Slot:I.Data[0] to go to 0x00E0 (225 dec).
  - f. Clear registers Local:Slot:O:2.Data[0] and Local:Slot:O:2.Data[1]. to 0.
  - g. Close and reopen the connection to module by:
    - i. Double clicking on our module in I/O configuration tree.
    - ii. Selecting Connection tab.
    - iii. Check “Inhibit Module”.
    - iv. Click on Apply.
    - v. Uncheck “Inhibit Module”.
    - vi. Click on Apply.

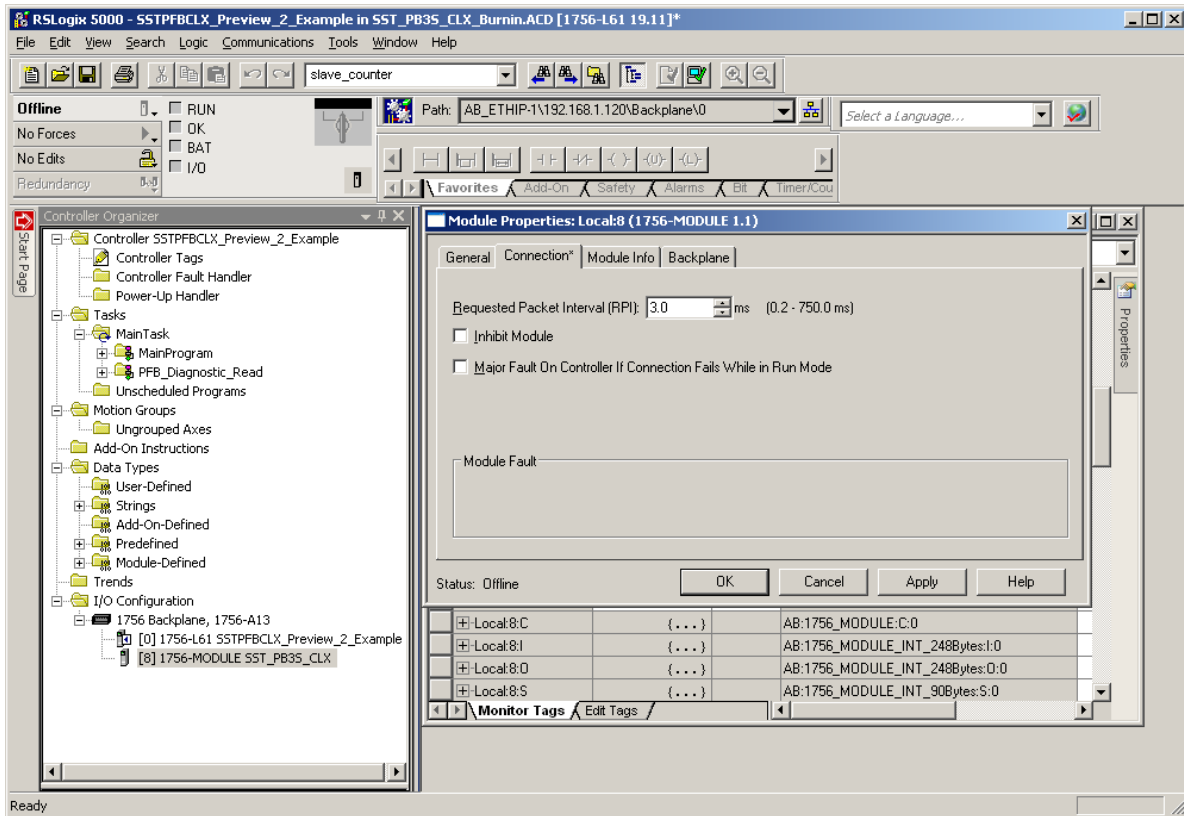
### 6.5.1 Configuring the CLX Slave in RSLogix 5000 using Generic Profile

When configuring the CLX slave in RSLogix 5000, you must set up the following connection parameters:

1. Navigate to the I/O Configuration.
2. Right-Click on I/O Configuration and select **New Module...**
3. Click on **By Category** and select 1756-MODULE and click OK.
4. The New Module Properties dialog box appears similar to below allowing you to set connection parameters.
5. The Assembly Instance for the configuration must be set to 3 and Size to 24 (by default, the size is Zero). All other assembly instances and sizes are to be set as in the screenshot below. The generated tables for I/O, status and configuration are located under Controller tags and will appear as in screenshot below under the Module properties dialog box.



- Configure the RPI for the module by clicking on the Connection tab. The lowest supported RPI is 3ms.



7. Click OK button.
8. See section 6.4 [Config table Additions](#) on setting the slave parameters in Configuration assembly (similar to Local:8:C as in above screenshot).

## 6.5.2 Configuring the CLX Slave in RSLogix 5000 using Add-on-Profile (AOP)

With AOP, the configuration file is automatically updated and adjusted to the correct length to configure the module successfully. Follow the steps below to configure module as DP Slave.

1. See the [quick start section 3.52](#) on the initial steps on getting the module added to the I/O configuration in your RSLogix 5000 project and ready to configure.
2. To configure the module as Slave only, Click on the Module Configuration tab and configure the following parameters:

The screenshot shows the 'New Module' dialog box with the 'Module Configuration\*' tab selected. The 'Mode' dropdown is set to 'Slave'. Under 'Slave Parameters', the following values are entered: Input Size: 0, Input Offset: 2, ProfibusDataIn [offset - 2], Output Size: 0, Output Offset: 2, ProfibusDataOut [offset - 2], Address: 1, and Baud: BAUD\_9k6. The 'Repeater', 'RxDataSwap', 'Auto-Run', and 'Legacy\_ID\_0876' checkboxes are unchecked. Under 'Master-Slave Parameters', Page INPUT is 0 and Page OUTPUT is 0. The status at the bottom is 'Creating'.

**Mode:** Select Slave.

**Repeater:** This option does not apply and can be left unchecked.

**RxDataSwap:** Set this if you want to swap the data coming from the master (Slave Rx data).

**Auto-Run:** Enable Auto-Run if you want the SST-PB3S-CLX-RLL to come online automatically and enter the mode the CLX CPU is in. If enabling Auto-Run and the SST-

PB3S-CLX-RLL is currently offline, the SST-PB3S-CLX-RLL will still remain offline after being reconfigured. In order for the Auto-Run to take effect, the SST-PB3S-CLX-RLL must be reset. This can be done by sending a RESET message to the module by going to the Module Info tab and clicking on module Reset button and then selecting OK to warning message.

**Legacy\_ID\_0876:** Enable this option if you want the module to use legacy Profibus ID 0x0876 instead of 0x0EC7 when it's operating in Slave mode. You must use the correct slave GSD file that goes with this slave ID. Use slave GSD file ssti0876.gse for Profibus ID 0x0876 and slave GSD file ssti0ec7.gse for Profibus ID 0x0EC7.

### Slave Parameters

**Input Size:** This is the length of slave receive data in Words. Valid input size is 1- 122.

**Output Size:** This is the length of slave transmit data in Words. Valid output size is 1- 122.

**Input Offset:** Specifies the word offset into the CLX input file where the slave Rx data should be mapped. Leave this offset at the default value 2. By default, the input data begins at tag Local:Slot.ProfibusDataIn[0].

**Output Offset:** Specifies the word offset into the CLX output file where the slave Tx data should be mapped. Leave this offset at the default value 2. By default, the output begins at tag Local:Slot.ProfibusDataOut[0].

**Address:** – This is the local station number configured for the slave. The valid range is 1-125.

**Baud:** This is the Baud rate and can be set to any one of these baud rates (9K6, 19K2, 93K75, 187K5, 500K, 1M5, 3M, 6M, 12M, 45k45).

AOP allows you to make modifications to your configuration and apply them while you have an open connection to module.

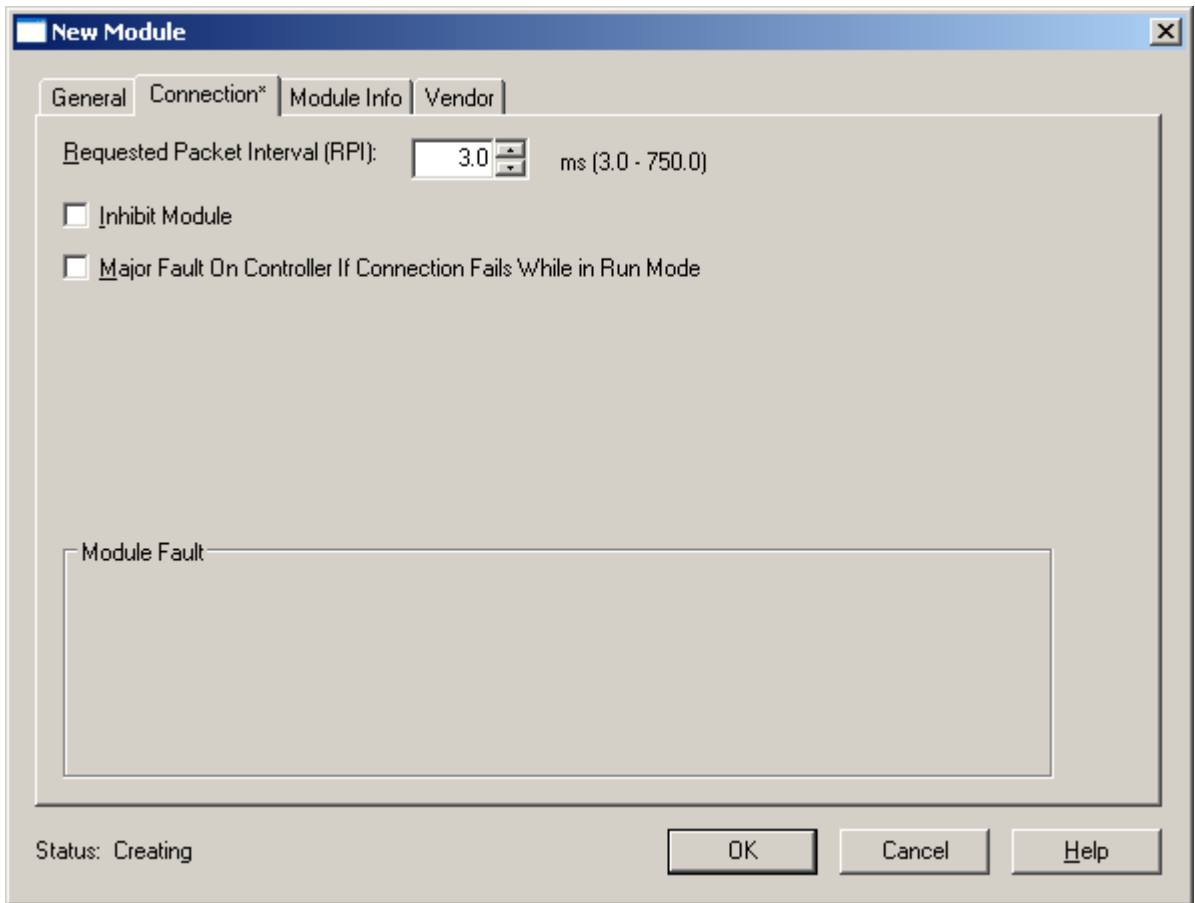


### Warning

Be aware that applying changes while the SST-PB3S-CLX-RLL is operational will interrupt Profibus communication. The card will go offline and online so the new configuration will take effect.

If you apply changes with AutoRun disabled, the SST-PB3S-CLX-RLL will stay offline until the ladder code issues the online command. If the CLX CPU is in PROG mode and AutoRun is enabled, the module will come back online. To see if applying the new configuration was successful, check the ReconfigStatus register in the module's status file.

3. Click on Connection tab and configure the RPI. The lowest supported RPI is 3ms.



4. Click on OK. The slave is now configured.





# A

## Technical Specifications

### Appendix Sections:

- Technical Specifications

## A.1 Technical Specifications

Table 23: Technical Specifications for the SST-PB3S-CLX-RLL, SST-PB3S-CLX-RLL-CC, SST-PB3S-CLXT-RLL modules

<b>Part Number</b>	SST-PB3S-CLX-RLL, SST-PB3S-CLX-RLL-CC, SST-PB3S-CLXT-RLL
<b>Function</b>	CLX-5000 slave for PROFIBUS networks
<b>Description</b>	<ul style="list-style-type: none"> <li>• Freescale MCF5272 processor</li> <li>• 8 MB of MCF5272 local RAM</li> <li>• 512 KB of onboard shared memory</li> <li>• 512 KB of sectored flash memory for storage of program and configuration data</li> <li>• ASPC2 LAN controller</li> </ul>
<b>CLX Interface</b>	<p>SST-PB3S-CLX-RLL supports up to a 122 words of input data and 122 words of output data. Status information available..Supports up to 244 bytes total data exchange</p> <p>250 words Status</p>
<b>Environmental</b>	<p>Storage temperature -40°C to 85°C</p> <p>Operating temperature:  0°C to 60°C SST-PB3S-CLX-RLL  0°C to 60°C SST-PB3S-CLX-RLL-CC  -25°C to 75°C SST-PB3S-CLXT-RLL</p> <p>Operating RH level 5% to 95%, non-condensing</p> <p>Pollution Degree 1 - no pollution or only non-conductive or non-corrosive pollution</p>
<b>Backplane Current Consumption</b>	850 mA @ 5 VDC 1.75 mA@24 VDC

# B

## Regulatory Compliance

### Appendix Sections:

- CE Compliance
- Rep. of Korea Compliance

## B.1 CE Compliance

Marking of this equipment with the **CE** symbol indicates compliance with European Council Directive 2004/108/EC.



### Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.



### Caution

This equipment is neither designed for, nor intended for operation in installations where it is subject to hazardous voltages and hazardous current.



### Note

To maintain compliance with the limits and requirements of the EMC Directive, it is required to use quality interfacing cables and connectors when connecting to this device. Refer to the cable specifications in the Hardware Guide for selection of cable types.



### Note

The backplane voltage supply for this equipment must be delivered as Separated Extra Low Voltage (SELV).

## B.2 Rep. of Korea Compliance

This device meets or exceeds the requirements of the following standards:

- Technical Requirements for Electromagnetic Susceptibility - RRA Notification 2011-17 (July 05,2011)
- Technical Requirements for Electromagnetic Interference – RRA Notification 2011-18 (July 05, 2011)



### User Notice

Classification	User Notice
Class A Device (Device for use in a commercial, industrial or business environment)	This device complies with Class A requirements and sellers and users should be cautious of this.  This device is intended for use in any environment except residential areas.



### 사용자안내문

기종별	사용자안내문
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.





## Warranty and Support

### Appendix Sections:

- Warranty
- Reference Documents
- Technical Support
- Getting Help

## C.1 Warranty

For warranty information, refer to

[http://www.molex.com/images/woodhead/woodhead\\_limited\\_warranty.pdf](http://www.molex.com/images/woodhead/woodhead_limited_warranty.pdf).

## C.2 Reference Documents

For...	Read this Document...	Document Number
General PROFIBUS information	<a href="http://www.profibus.com/">http://www.profibus.com/</a>	N/A
A-B power supply specifications	CLX 5000 Modular Style Installation & Operation Manual	Allen-Bradley Publication 1747-6.2
RSLogix information	ControlLogix 5000 Controllers General Instruction Set Reference Manual	AB Publication number 1756-6.4.1 and 1756-RM003A-US-P
CLX Chassis installation	ControlLogix Chassis Installation Instructions	AB Publication number 1756-5.80
Honeywell PlantScape information	PlantScape Process System and Controller Product Overview	PS03-140 Release 400
Implementing PROFIBUS on the Honeywell PlantScape System	PlantScape PROFIBUS Implementation Guide	N/A

For more information on PROFIBUS, refer to the following:

- PROFIBUS standard DIN 19245, parts 1 and 3. Part 1 describes the low-level protocol and electrical characteristics. Part 3 describes the DP protocol.
- European standard EN 50170
- ET 200 Distributed I/O system, 6ES5 998-3ES22
- IEEE 518 Guide for the Installation of Electrical Equipment to minimize Electrical Noise Input to Controllers



## C.3 Technical Support

Please ensure that you have the following information readily available before calling for Technical Support:

- SST-PB3S-CLX-RLL serial number
- Computer's make, model, CPU speed and hardware configuration (other cards installed)
- Operating system type and version
- Details of the problem you are experiencing: firmware module type and version, target network and circumstances that may have caused the problem

## C.4 Getting Help

Technical support is available during regular business hours by telephone, fax or email. The Molex web site contains useful information that can be accessed by clicking the link below:

### [Molex Support and Download](#)

- Downloads center
- Support Request Form
- Knowledge Base
- Worldwide technical support contacts