GE
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Programmable Control Products

# PACSystems* RSTi

## PROFIBUS and PROFINET Network Adapter

User's Manual, GFK-2746B

August 2013

## *Warnings, Cautions and Notes as Used in this Publication*

**Warning**

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

**Caution**

Caution notices are used where equipment might be damaged if care is not taken.

**Note:** Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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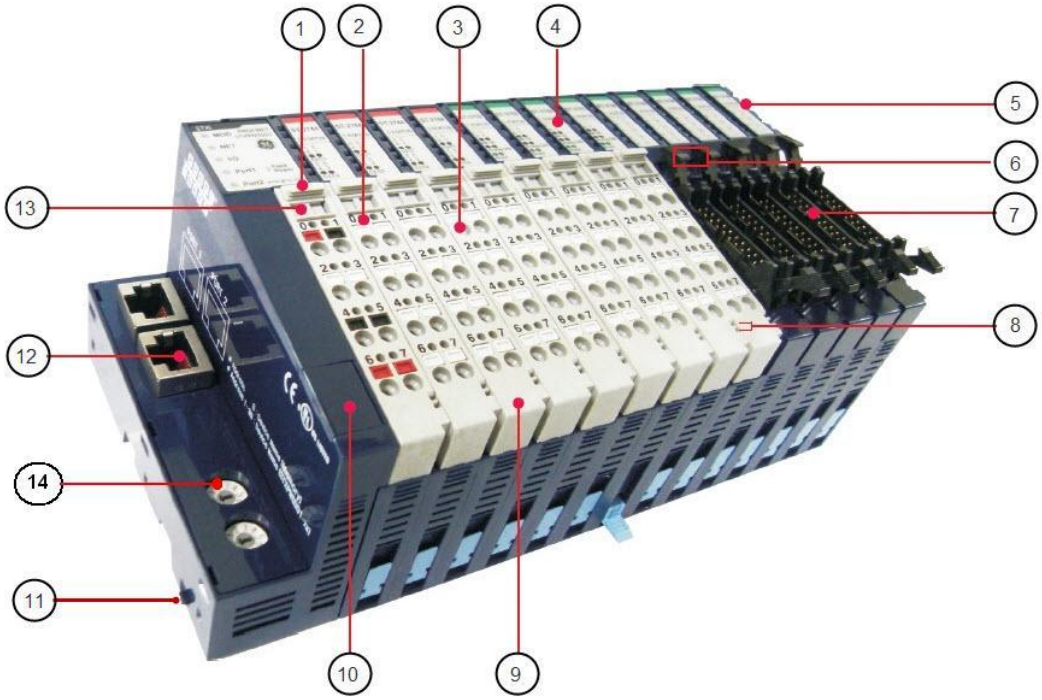
# Contents

# 1. Introduction

The PACSystems RSTi Network Interface and I/O family provides a cost effective, modular distributed I/O system. The RSTi network is ideally suited for distributed applications such as water/wastewater, process control, packaging and assembly. You can easily add RSTi modules to the system to build functional remote I/O stations to meet your application requirements.




| Sr. Number | Label |
|---|---|
| 1 | Removable Switch of Terminal Block |
| 2 | Tester Pin Hole |
| 3 | Screw less Connection System |
| 4 | I/O Status Display LED |
| 5 | System-Data Pin (6 Pins) |
| 6 | Module Number Marking (Header Type) |
| 7 | Header Type Module (16 points) |
| 8 | Field Power Pin (2 pins) |

| Sr. Number | Label |
|---|---|
| 9 | RTB (Removable Terminal Block) |
| 10 | Reserved communication Port (Useful to only manufacturer) |
| 11 | PUSH Lock for DIN rail |
| 12 | Fieldbus Connector (actual connector depends upon the type network adapter) |
| 13 | Module Number Marking (on the Removable terminal Block |
| 14 | Node ID or station address setting (either rotary or dip switches depends upon the type of network adapter) |

A set of interconnected RSTi modules can be chosen to suit the application and connected as a slave on a PROFIBUS or a PROFINET network. An RSTi Network Adapter provides the interface between the network and the RSTi modules. The Network Adapter and I/O modules selected for an application constitute an I/O station.

## 1.1 I/O Station Capacity

- Up to 32 IO devices can be connected to a Network Adapter (STXPBS001, STXPNS001) whereas. PROFIBUS network adapters with integrated IO support only up to 8 IO modules. The power consumption of all the modules in the node should be calculated and ensured that it does not exceed the capacity of Network Adapter and power modules.
- The sum of all input and output data can be up to:
  - 504 bytes per station for a PROFINET network
  - 256 bytes / 72 bytes per station for a PROFIBUS network (for STXPBS001, 256 bytes and for STXPBS* with Integrated IO, 72 bytes)
- The maximum number of I/O stations per RX3i PPROFINET controller is 128 and for Rx3i PROFIBUS Controller is 125

## 1.2 Network Topology

For PROFIBUS networks, I/O stations can be connected via linear bus architecture with active bus termination at both ends. Devices in a PROFIBUS network connect directly to the bus cable or indirectly via stub lines.

For PROFINET networks, I/O stations can be connected using either linear or star architecture.

## 1.3 Installation

The Network Adapter must be connected to the left of the other RSTi modules in the I/O station.

Within the RSTi station the bus connection, power supply, and power distribution are completed by connecting modules together on the DIN rail. Sensors and actuators are wired to the RSTi modules using spring clamp terminals on the module's removable terminal strips. These terminal strips can be keyed so that they cannot be accidentally swapped. If a module must be replaced, the wiring does not need to be removed; just remove the terminal strip from the module.

RSTi PROFIBUS Network Adapter with Integrated digital I/O is available. It combines the advantages of slice-type and block-type construction and offers reduced system design and maintenance costs.

## 1.4 IOGuidePro Tool for Configuration & Monitoring

PACSystems RSTi Network adapters can be configured & monitored using IOGuidePro tool.

You can use the IOGuidePro Tool to monitor & configure the following data:

- Online monitoring & configuration of MODBUS serial & TCP Network adapters.
- Offline configuration of PROFIBUS, DeviceNet & Ethernet/IP Network adapters.
- RSTi Network adapter & IO node over view.
- Power consumption details.
- IO module configuration parameters & memory map.
- RSTi Network adapter & IO module technical help.

For more information refer the help section of IOGuidePro tool.

## 1.5 Features

- Modules can be easily installed and connected without tools.
- Flexible and modular structure allows I/O stations to be easily expanded.
- A comprehensive selection of I/O modules supports a wide range of applications.
- Small removable terminal blocks conserve panel space and save time making system connections.
- Module-based diagnostic functions
- The amount of costly parallel wiring is reduced. Within a station, voltage and data routing can be carried out without additional wiring, reducing the cabinet space needed.
- Different parts of the system can be operated independent of one another. This means that pretests can be carried out when the system is set up and that the whole system can be adapted and expanded.

## 1.6 List of RSTi Network adapters

RSTi PROFIBUS Network Adapters:

- STXPBS001 PROFIBUS DP/V1 network adapter
- STXPBS032 32 point Positive Logic Input
- STXPBS132 32 point Negative Logic Input
- STXPBS232 32 point Negative Logic Output
- STXPBS332 32 point Positive Logic Output
- STXPBS016 16 relay output
- STXPBS116 16 relay output isolated
- STXPBS432 16 Positive Logic in/16 Negative Logic out
- STXPBS532 16 Negative Logic in/16 Negative Logic out
- STXPBS824 16 Positive Logic in/8 relay out
- STXPBS924 16 Negative Logic in/8 relay out
- STXPBS825 16 Positive Logic in/8 relay out isolated
- STXPBS925 16 Negative Logic in/8 relay out isolated

RSTi PROFINET Network Adapter

- STXPNS001 PROFINET network adapter

## 1.7 PACSystems Documentation

- PACSystems RSTi I/O Manual – GFK 2745

# 2. Installation

**Warning**

**Installing or removing modules or wiring with power applied to the system or field wiring can cause an electrical arc. This can result in unexpected and potentially dangerous action by field devices. Arcing is an explosion risk in hazardous locations. Be sure that the area is non-hazardous or remove power appropriately before installing or removing modules or wiring.**

**Potentially dangerous voltages are present on a module's terminals, even when system power is turned off. Field power must be turned off when installing or removing a terminal block assembly.**

**Personnel, who install, operate and maintain automation systems that contain these products must be trained and qualified to perform those functions.**

**Overloading power modules or Network adapter can result into electric arc and damage to modules.**

**Caution**

**Check the rated voltage and terminal array before wiring.**

**Ensure that specified environmental conditions are not exceeded. Avoid placing the module in direct sunlight.**

**Review module specifications carefully, and ensure that input and output connections are made in accordance with the specifications.**

**Use specified cables for wiring.**

**Field power isolators must be used according to the requirements of the 5VDC/24VDC/48VDC or AC voltage modules used in the system.**

**If system power consumption exceeds the power limits, use system power expansion modules.**

**Power supplies for system power and field power must be supplied from separate sources.**

## 2.1 Module Mounting

### 2.1.1 How to Mount on DIN Rail

1. Press down the module lightly on the DIN Rail until it clicks & locks.

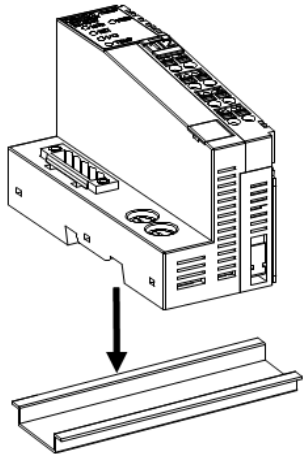


***Figure 1: Pressing down the module lightly***

2. . You can use the PUSH lock for DIN rail up as a second locking mechanism.

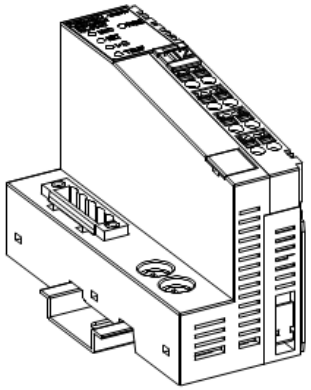


***Figure 2: PUSH lock as a second locking mechanism***

### 2.1.2 How to dismount from DIN Rail

1. Pull down the locking mechanism by using small flat screw driver as in the following figures.

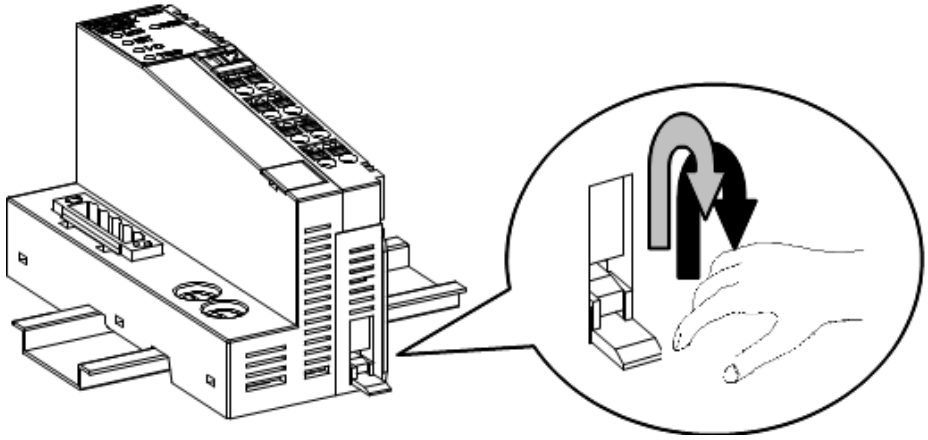


*Figure 3: Pulling down the lock*

2. Pull up the module to remove from the DIN rail.

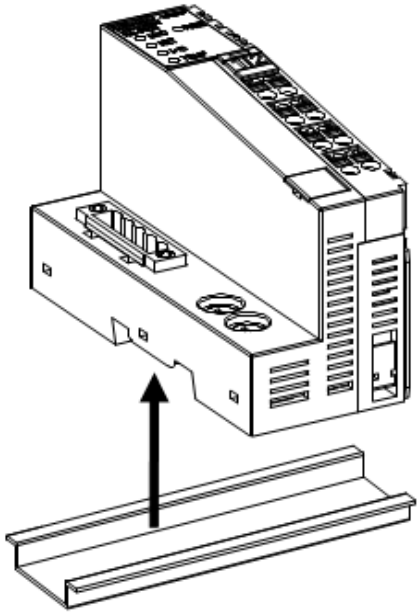


*Figure 4: Pulling up the module*

### 2.1.3 How to mount and dismount Network adapter with Integrated IO

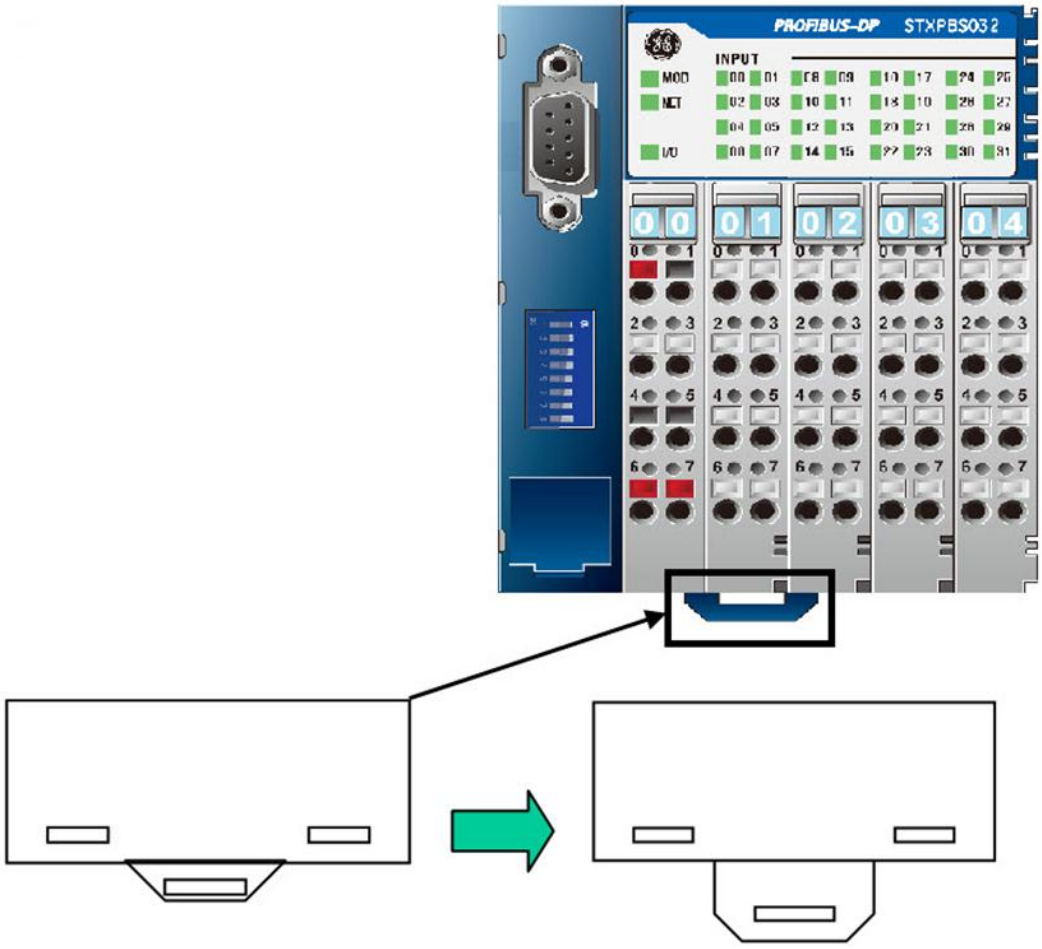



***Figure 5: module mounting/dismounting instructions***

Release the DIN rail locking clip by pulling clip downward with a small-bladed screwdriver. The clip will click and lock into the open position. Install the module on the DIN rail firmly. Once module is in place on the DIN rail, push the clip upward to secure the module on the DIN rail. To remove, pull clip downward until the locking clip clicks and locks, the module can now be removed from the DIN rail.

**Note:** Make sure that the locking clip is in the upward position to ensure the module is properly grounded and secured to the DIN rail.

## 2.2 Installing and Removing Components

To plug in the module use a small-bladed screwdriver and push down the locking lever located at bottom of the module. Install the module on DIN rail firmly; push up the locking lever to lock. To pull out the RSTi module, push down the locking lever rail.

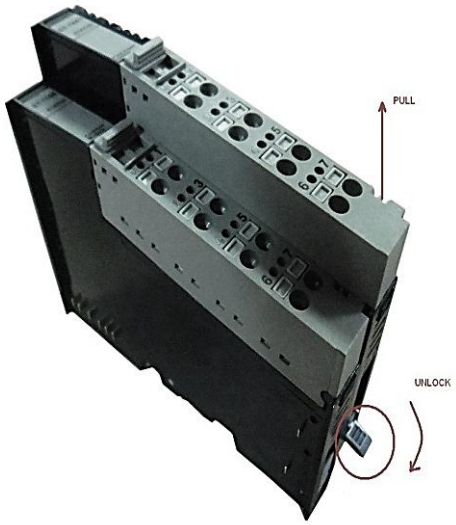



***Figure 6: Removing RSTi module from DIN rail***

## 2.3 Internal Bus/Field Power Contacts

Communication between the Network adapters and the IO module as well as system / field power supply of the bus modules is carried out via the internal bus. It is comprised of 6 data pins and 2 field power pins.

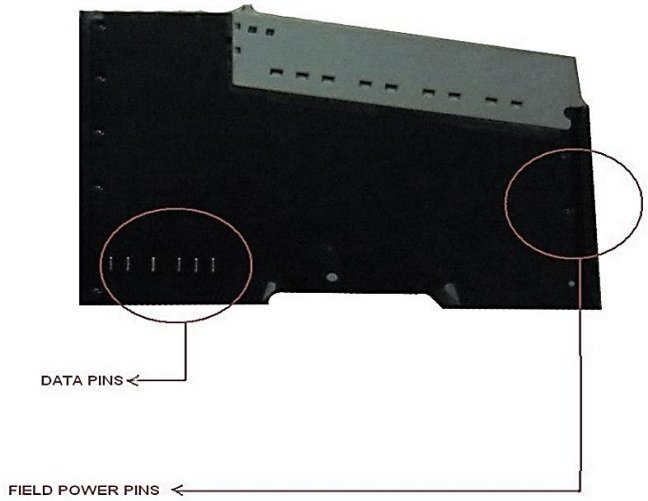



*Figure 7: Internal bus with 6 data pins and 2 field power pins*

**Warning**

**Do not touch data and field power pins, in order to avoid damage by ESD noise.**

### 2.3.1 RSTi Bus Data Pin & Field Power Pin Description

*Table 1: RSTi Bus Pin Name and Description*

| No. | Name | Description |
|---|---|---|
| 1 | Vcc | System supply voltage (5V dc) |
| 2 | GND | System Ground |
| 3 | Token Output | Token output port of Processor module |
| 4 | Serial Output | Transmitter output port of Processor module |
| 5 | Serial Input | Receiver input port of Processor module |
| 6 | Reserved | Reserved for bypass Token |
| 7 | Field GND | Field Ground |
| 8 | Field Vcc | Field supply voltage (24Vdc) |

### 2.3.2 RSTi Data Bus System

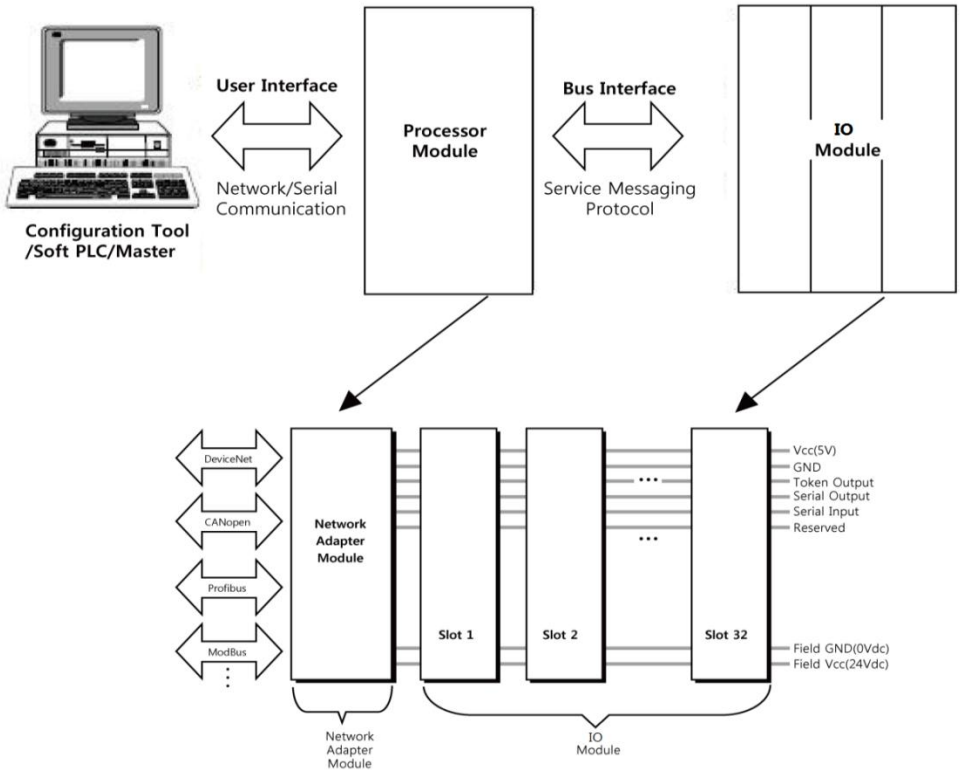



*Figure 8: Interface between different modules*

- **Network Adapter Module**: The Network Adapter Module forms the link between the field bus and the field devices through IO Modules. The connection to different field bus systems can be established by each of the corresponding Network Adapter Modules: PROFIBUS, CANopen, DeviceNet, Ethernet/IP, CC-Link, MODBUS/Serial, MODBUS/TCP, PROFINET etc.
- **IO Module**: The IO Modules are supported by a variety of input and output field devices. There are digital and analog input/output modules and special function modules.
- **Two types** of **Bus Message**

  Service Messaging
  I/O Messaging

# 3. PROFIBUS Network Adapters

PROFIBUS Network Adapters include STXPBS001 and STXPBS* modules.

- STXPBS001

  The following are the features of STXPBS001:

  - STXPBS001 is connected with the PROFIBUS-DP by means of 9 Pin D-sub Connector.
  - It works as a slave in the Master/Slave environment.
  - The node size is able to extend up to 32 IO modules units.
  - Each STXPBS001 can control maximum 1024 digital input/1024 digital output, or 64 analog input/64 analog output channels.
  - LED indicators for diagnostic functions (the status of Module, network expansion units, and field power)
  - It has got the PNO conformance certificate. This means it has interoperability with other PROFIBUS products.
  - It supports the communication speed from 9.6Kbps to 12Mbps and the auto baud rate detection.
  - The station number is assigned by rotary switches.

- STXPBS*

  The following are the features of STXPBS*:

  - STXPBS* supports PROFIBUS communication protocol and is connected with PROFIBUS by means of 9 Pin open Connector.
  - These modules work as a slave under Master/Slave circumstances.
  - They allow I/O Data communications with Master by means of polling process.
  - They support the transmission rate from 9.6Kbps to 12Mbps and Auto Baudrate detection.
  - The station number is assigned by dip switches.

*** indicates STXPBS032/132/232/332/016/116/432/532/824/924/825/925.**

## 3.1 STXPBS001

### 3.1.1 Interface

The following figure shows the interface diagram for STXPBS001.

PROFIBUS Connector

| Pin No. | Description |
|---|---|
| 3 | RxD / TxD–P |
| 4 | CNTR–P |
| 5 | DGND |
| 6 | VP |
| 8 | RxD / TxD–N |
| 9 | CNTR–N |

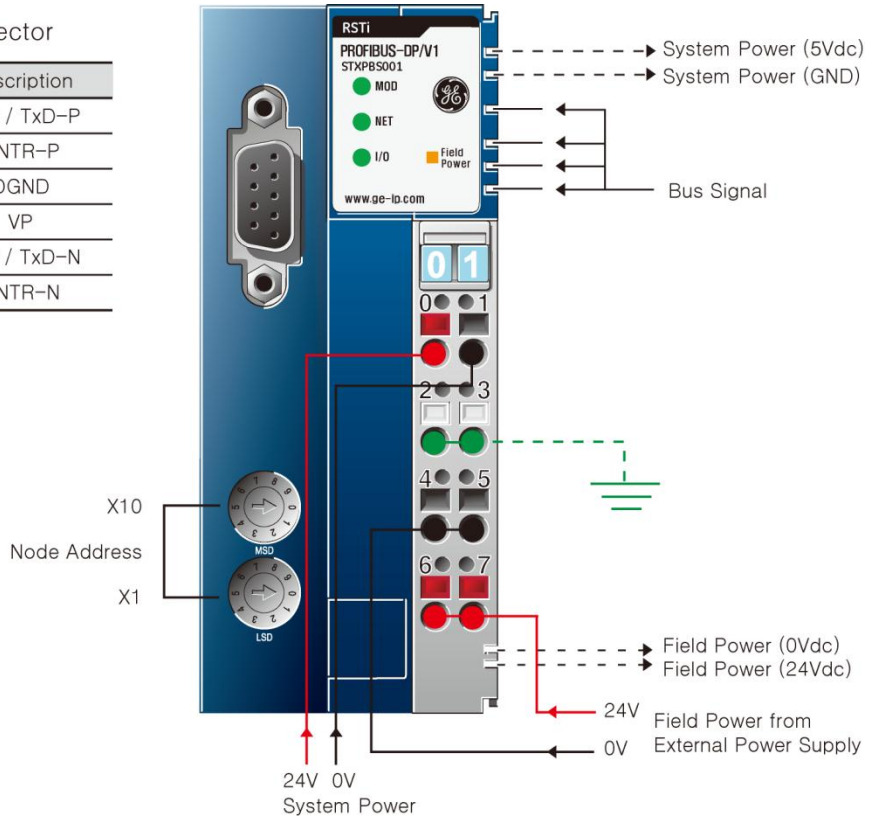



***Figure 9: PROFIBUS Network Adaptor Module: STXPBS001***

The following table lists the pin numbers and their description for STXPBS001.

***Table 2: STXPBS001: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 0 | System power 24v | 1 | System power 0 v |
| 2 | Ground | 3 | Ground |
| 4 | Field power 0v | 5 | Field power 0v |
| 6 | Field power 24v | 7 | Field power 24v |

### 3.1.2 Specifications

The following table describes the specifications of STXPBS001.

***Table 3: STXPBS001: Interface Specifications***

| Item | Specification |
|---|---|
| Network Type | PROFIBUS-DP |
| Network Cable | PROFIBUS-DP Special Cable |
| Cable Length | 1.2Km ~ 100m |
| Maximum Station No. | 99 Station (Include Master Scanner) |
| Station Type | PROFIBUS-DP Slave |
| Expansion No. | Maximum 32 Module |
| Baud rate Setting | Support Auto-baud rate |
| Station No. Setting | Rotary S/W #1, #2 (x10, x1) |
| I/O Data Size | Total: Input 128bytes/Output 128bytes<br>– Maximum Discrete I/O: Input 1024points/Output 1024points<br>– Maximum Analog I/O: Input 64channels/Output 64channels |
| Indicators | 1 green/red Module Status Indicator<br>1 green Network Status Indicator<br>1 green/red IO Module Status indicator<br>1 green Field Power Status indicator |
| Baud Rate | 9.6K~12M (1.2Km~100m) (Auto baud rate Selection) |
| Module Location | First module of RSTi system |
| Station type | Slave |
| Repeater Control Signal | TTL |
| Freeze mode | Supported |
| Sync mode | Supported |
| Auto baud rate | Supported |
| Fail safe mode | Supported |
| FMS support | Not supported |
| Redundancy | Not supported |

***Table 4: STXPBS001: General Specifications***

| Item | Specification |
|---|---|
| System Power | Supply voltage : 24Vdc nominal<br>Supply voltage range : 11~28.8Vdc<br>Protection : Output current limit(1.5A)<br>Reverse polarity protection |
| Power Dissipation | 60mA typical @24Vdc |
| Current for I/O Module | 1.5A @5Vdc |
| Isolation | DeviceNet to internal logic : Non-isolation<br>Internal logic to I/O driver : Isolation |
| Field Power | Supply voltage : 24Vdc nominal<br>Supply voltage range : 11~28.8Vdc |
| Field Power detection | About 11Vdc |
| Max. Current Field Power Contact | DC 10A Max. |
| Weight | 155g |
| Module Size | 42mm x 99mm x 70mm |
| Vibration/shock resistance | IEC 60068-2-6:1995 |
| EMC resistance burst/ESD | EMC Directive |
| Installation Pos. / Protect. Class | Variable/IP20 |
| Product Certifications | $_{c}UL_{us}$, CE, PROFIBUS (PNO), ATEX, UL Hazloc |
| Atmosphere | No excessive dust , No corrosive gases |
| Mount | DIN-Rail |
| Environment Condition | See “Environmental Specifications" in Appendix A. |

## 3.2 STXPBS*

### 3.2.1 Interface

#### 3.2.1.1 STXPBS032 – Adapter with 32 pt Positive Logic Input

The following figure shows the interface diagram for STXPBS032.

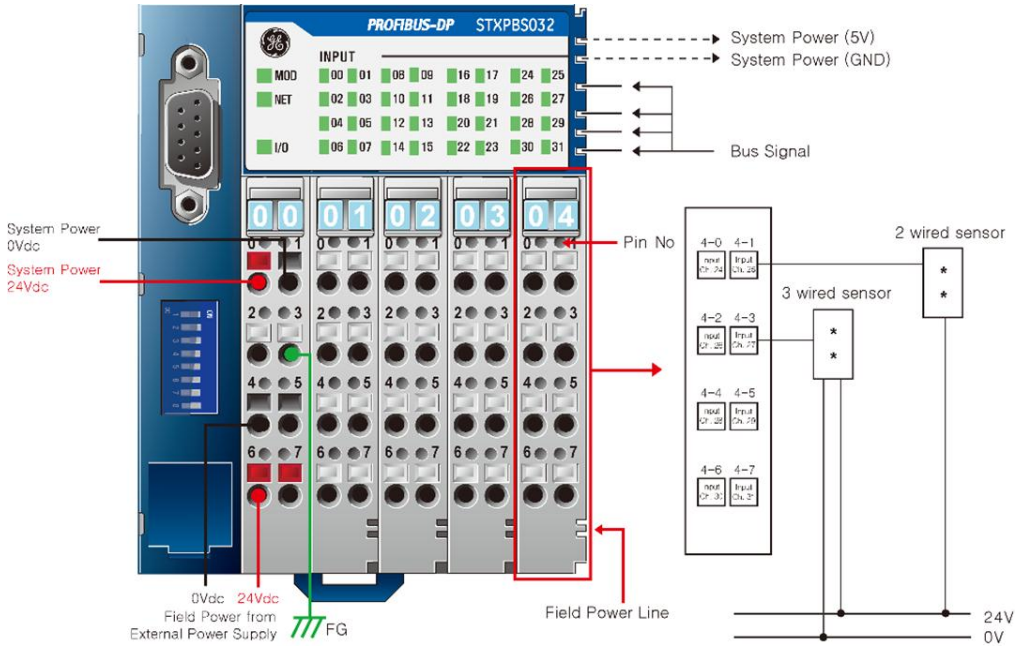



***Figure 10: PROFIBUS Network Adaptor Module: STXPBS032***

***Table 5: STXPBS032: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Input Channel 16 |
| 01-1 | Input Channel 1 | 03-1 | Input Channel 17 |
| 01-2 | Input Channel 2 | 03-2 | Input Channel 18 |
| 01-3 | Input Channel 3 | 03-3 | Input Channel 19 |
| 01-4 | Input Channel 4 | 03-4 | Input Channel 20 |
| 01-5 | Input Channel 5 | 03-5 | Input Channel 21 |
| 01-6 | Input Channel 6 | 03-6 | Input Channel 22 |
| 01-7 | Input Channel 7 | 03-7 | Input Channel 23 |
| 02-0 | Input Channel 8 | 04-0 | Input Channel 24 |
| 02-1 | Input Channel 9 | 04-1 | Input Channel 25 |
| 02-2 | Input Channel 10 | 04-2 | Input Channel 26 |
| 02-3 | Input Channel 11 | 04-3 | Input Channel 27 |
| 02-4 | Input Channel 12 | 04-4 | Input Channel 28 |
| 02-5 | Input Channel 13 | 04-5 | Input Channel 29 |
| 02-6 | Input Channel 14 | 04-6 | Input Channel 30 |
| 02-7 | Input Channel 15 | 04-7 | Input Channel 31 |

### 3.2.1.2 STXPBS132 – Adapter with 32 pt Negative Logic Input

The following figure shows the interface diagram for STXPBS132.

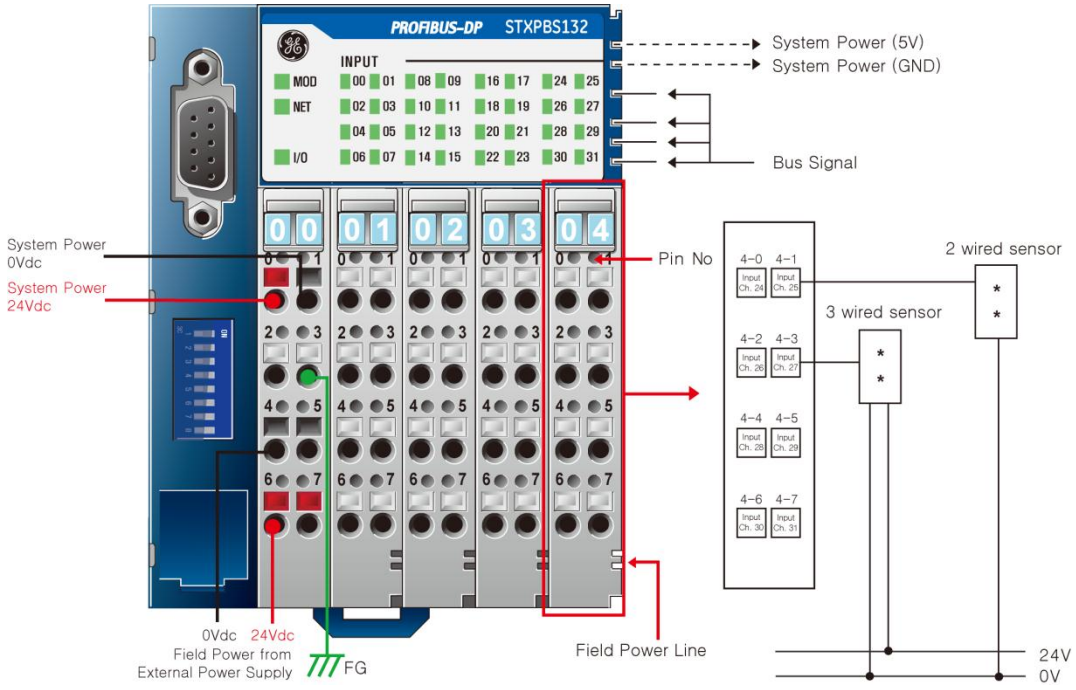



*Figure 11: PROFIBUS Network Adaptor Module: STXPBS132*

*Table 6: STXPBS132: Pin Description*

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Input Channel 16 |
| 01-1 | Input Channel 1 | 03-1 | Input Channel 17 |
| 01-2 | Input Channel 2 | 03-2 | Input Channel 18 |
| 01-3 | Input Channel 3 | 03-3 | Input Channel 19 |
| 01-4 | Input Channel 4 | 03-4 | Input Channel 20 |
| 01-5 | Input Channel 5 | 03-5 | Input Channel 21 |
| 01-6 | Input Channel 6 | 03-6 | Input Channel 22 |
| 01-7 | Input Channel 7 | 03-7 | Input Channel 23 |
| 02-0 | Input Channel 8 | 04-0 | Input Channel 24 |
| 02-1 | Input Channel 9 | 04-1 | Input Channel 25 |
| 02-2 | Input Channel 10 | 04-2 | Input Channel 26 |
| 02-3 | Input Channel 11 | 04-3 | Input Channel 27 |
| 02-4 | Input Channel 12 | 04-4 | Input Channel 28 |
| 02-5 | Input Channel 13 | 04-5 | Input Channel 29 |
| 02-6 | Input Channel 14 | 04-6 | Input Channel 30 |
| 02-7 | Input Channel 15 | 04-7 | Input Channel 31 |

### 3.2.1.3 STXPBS232 – Adapter with 32 point Negative Logic Output

The following figure shows the interface diagram for STXPBS232.

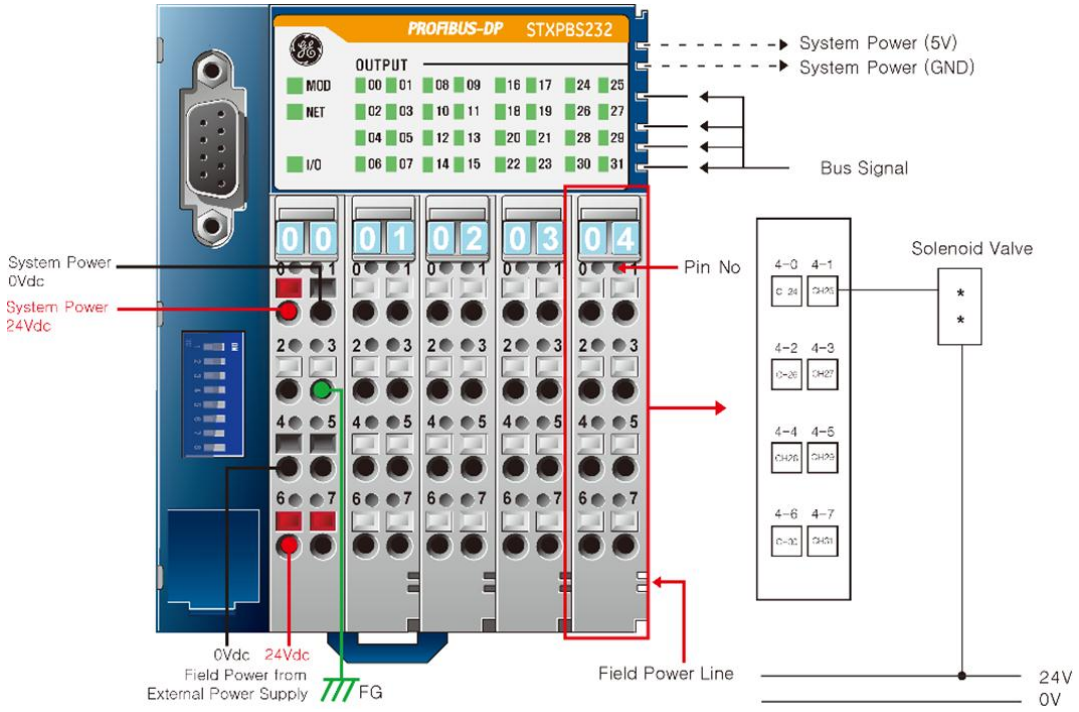



***Figure 12: PROFIBUS Network Adaptor Module: STXPBS232***

***Table 7: STXPBS232: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Output Channel 0 | 03- 0 | Output Channel 16 |
| 01-1 | Output Channel 1 | 03-1 | Output Channel 17 |
| 01-2 | Output Channel 2 | 03-2 | Output Channel 18 |
| 01-3 | Output Channel 3 | 03-3 | Output Channel 19 |
| 01-4 | Output Channel 4 | 03-4 | Output Channel 20 |
| 01-5 | Output Channel 5 | 03-5 | Output Channel 21 |
| 01-6 | Output Channel 6 | 03-6 | Output Channel 22 |
| 01-7 | Output Channel 7 | 03-7 | Output Channel 23 |
| 02-0 | Output Channel 8 | 04-0 | Output Channel 24 |
| 02-1 | Output Channel 9 | 04-1 | Output Channel 25 |
| 02-2 | Output Channel 10 | 04-2 | Output Channel 26 |
| 02-3 | Output Channel 11 | 04-3 | Output Channel 27 |
| 02-4 | Output Channel 12 | 04-4 | Output Channel 28 |
| 02-5 | Output Channel 13 | 04-5 | Output Channel 29 |
| 02-6 | Output Channel 14 | 04-6 | Output Channel 30 |
| 02-7 | Output Channel 15 | 04-7 | Output Channel 31 |

### 3.2.1.4 STXPBS332 – Adapter with 32 point Positive Logic Output

The following figure shows the interface diagram for STXPBS332.

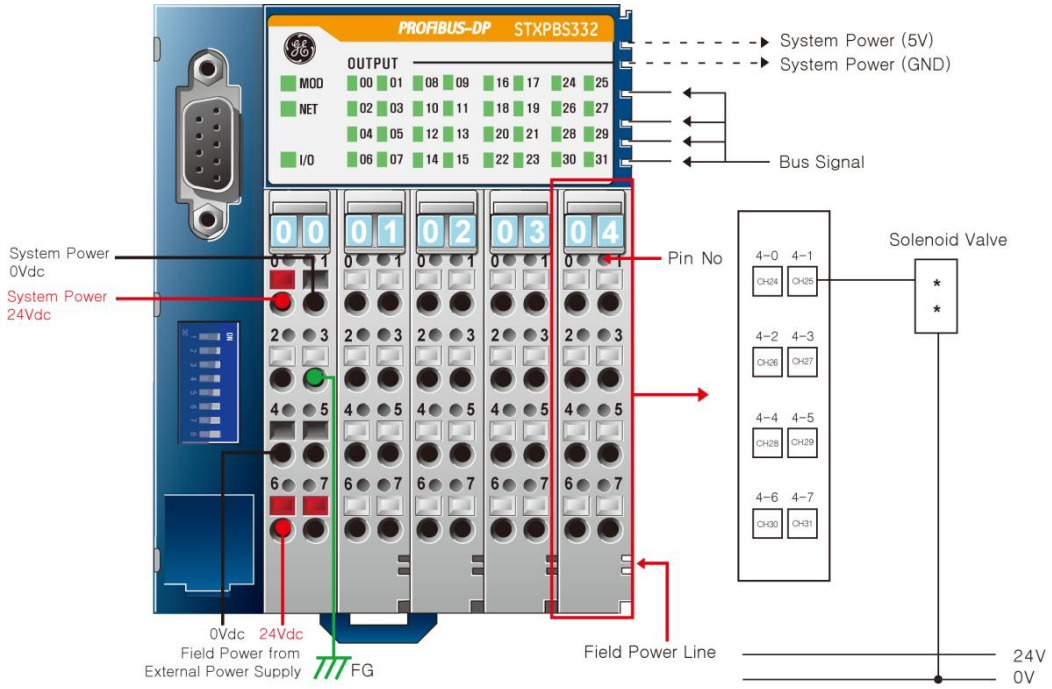



*Figure 13: PROFIBUS Network Adaptor Module: STXPBS332*

*Table 8: STXPBS332: Pin Description*

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Output Channel 0 | 03- 0 | Output Channel 16 |
| 01-1 | Output Channel 1 | 03-1 | Output Channel 17 |
| 01-2 | Output Channel 2 | 03-2 | Output Channel 18 |
| 01-3 | Output Channel 3 | 03-3 | Output Channel 19 |
| 01-4 | Output Channel 4 | 03-4 | Output Channel 20 |
| 01-5 | Output Channel 5 | 03-5 | Output Channel 21 |
| 01-6 | Output Channel 6 | 03-6 | Output Channel 22 |
| 01-7 | Output Channel 7 | 03-7 | Output Channel 23 |
| 02-0 | Output Channel 8 | 04-0 | Output Channel 24 |
| 02-1 | Output Channel 9 | 04-1 | Output Channel 25 |
| 02-2 | Output Channel 10 | 04-2 | Output Channel 26 |
| 02-3 | Output Channel 11 | 04-3 | Output Channel 27 |
| 02-4 | Output Channel 12 | 04-4 | Output Channel 28 |
| 02-5 | Output Channel 13 | 04-5 | Output Channel 29 |
| 02-6 | Output Channel 14 | 04-6 | Output Channel 30 |
| 02-7 | Output Channel 15 | 04-7 | Output Channel 31 |

### 3.2.1.5 STXPBS016 – Adapter with 16 relay output

The following figure shows the interface diagram for STXPBS016.

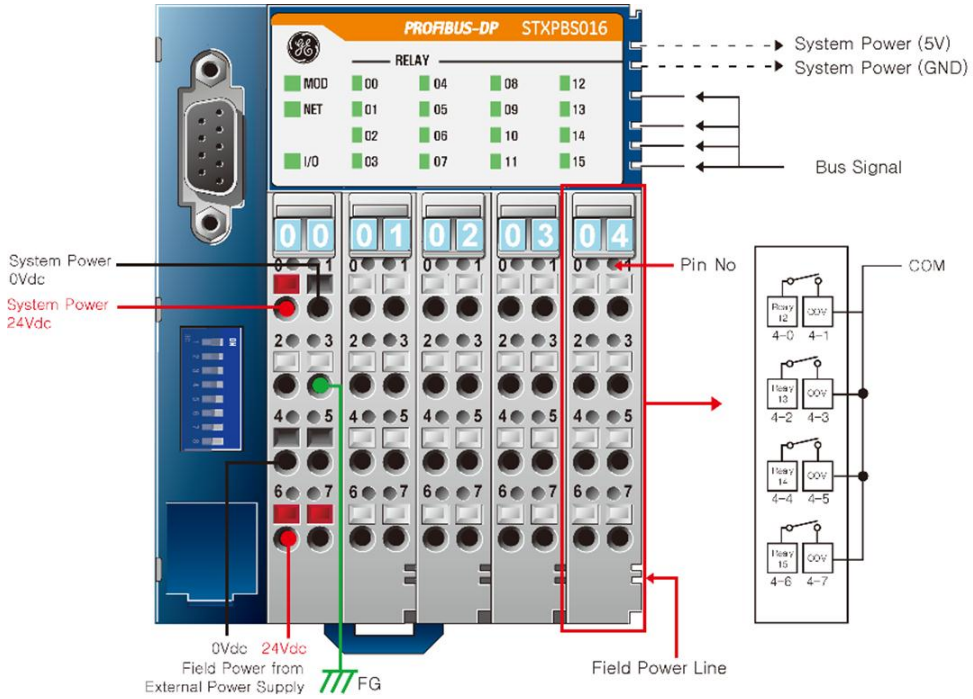



***Figure 14: PROFIBUS Network Adaptor Module: STXPBS016***

***Table 9: STXPBS016: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Relay Output 0 | 03- 0 | Relay Output 8 |
| 01-1 | COM 0 | 03-1 | COM 2 |
| 01-2 | Relay Output 1 | 03-2 | Relay Output 9 |
| 01-3 | COM 0 | 03-3 | COM 2 |
| 01-4 | Relay Output 2 | 03-4 | Relay Output 10 |
| 01-5 | COM 0 | 03-5 | COM 2 |
| 01-6 | Relay Output 3 | 03-6 | Relay Output 11 |
| 01-7 | COM 0 | 03-7 | COM 2 |
| 02-0 | Relay Output 4 | 04-0 | Relay Output 12 |
| 02-1 | COM 1 | 04-1 | COM 3 |
| 02-2 | Relay Output 5 | 04-2 | Relay Output 13 |
| 02-3 | COM 1 | 04-3 | COM 3 |
| 02-4 | Relay Output 6 | 04-4 | Relay Output 14 |
| 02-5 | COM 1 | 04-5 | COM 3 |
| 02-6 | Relay Output 7 | 04-6 | Relay Output 15 |
| 2-7 | COM 1 | 4-7 | COM 3 |

### 3.2.1.6 STXPBS116 – Adapter with 16 relay output isolated

The following figure shows the interface diagram for STXPBS116.

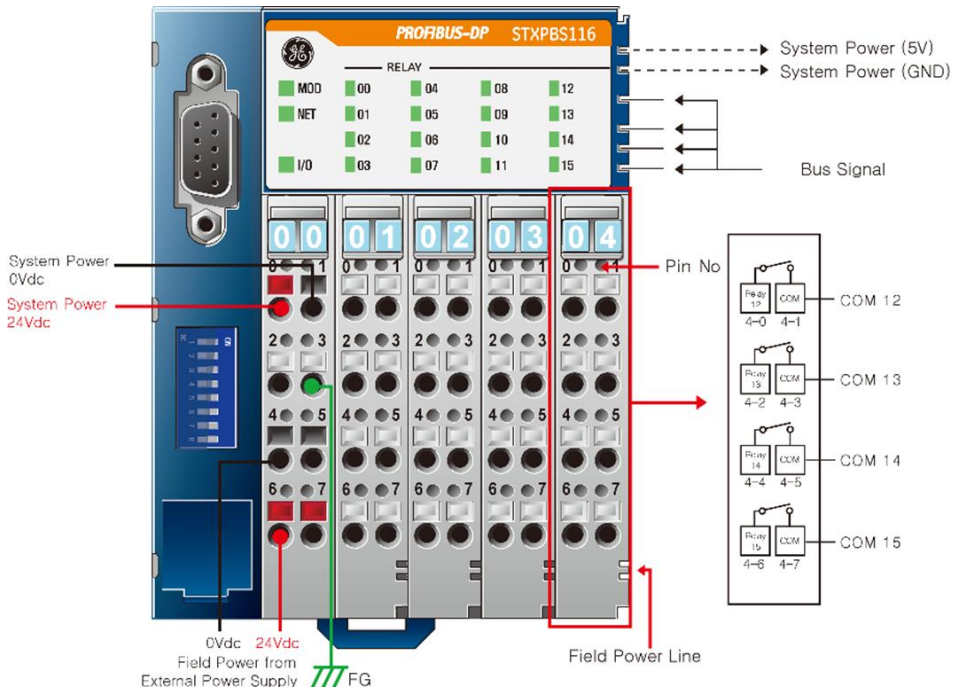



***Figure 15: PROFIBUS Network Adaptor Module: STXPBS116***

***Table 10: STXPBS116: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Relay Output 0 | 03- 0 | Relay Output 8 |
| 01-1 | COM 0 | 03-1 | COM 8 |
| 01-2 | Relay Output 1 | 03-2 | Relay Output 9 |
| 01-3 | COM 1 | 03-3 | COM 9 |
| 01-4 | Relay Output 2 | 03-4 | Relay Output 10 |
| 01-5 | COM 2 | 03-5 | COM 10 |
| 01-6 | Relay Output 3 | 03-6 | Relay Output 11 |
| 01-7 | COM 3 | 03-7 | COM 11 |
| 02-0 | Relay Output 4 | 04-0 | Relay Output 12 |
| 02-1 | COM 4 | 04-1 | COM 12 |
| 02-2 | Relay Output 5 | 04-2 | Relay Output 13 |
| 02-3 | COM 5 | 04-3 | COM 13 |
| 02-4 | Relay Output 6 | 04-4 | Relay Output 14 |
| 02-5 | COM 6 | 04-5 | COM 14 |
| 02-6 | Relay Output 7 | 04-6 | Relay Output 15 |
| 02-7 | COM 7 | 04-7 | COM 15 |

### 3.2.1.7 STXPBS432 – Adapter with 16 Positive Logic in/16 Negative Logic out

The following figure shows the interface diagram for STXPBS432.

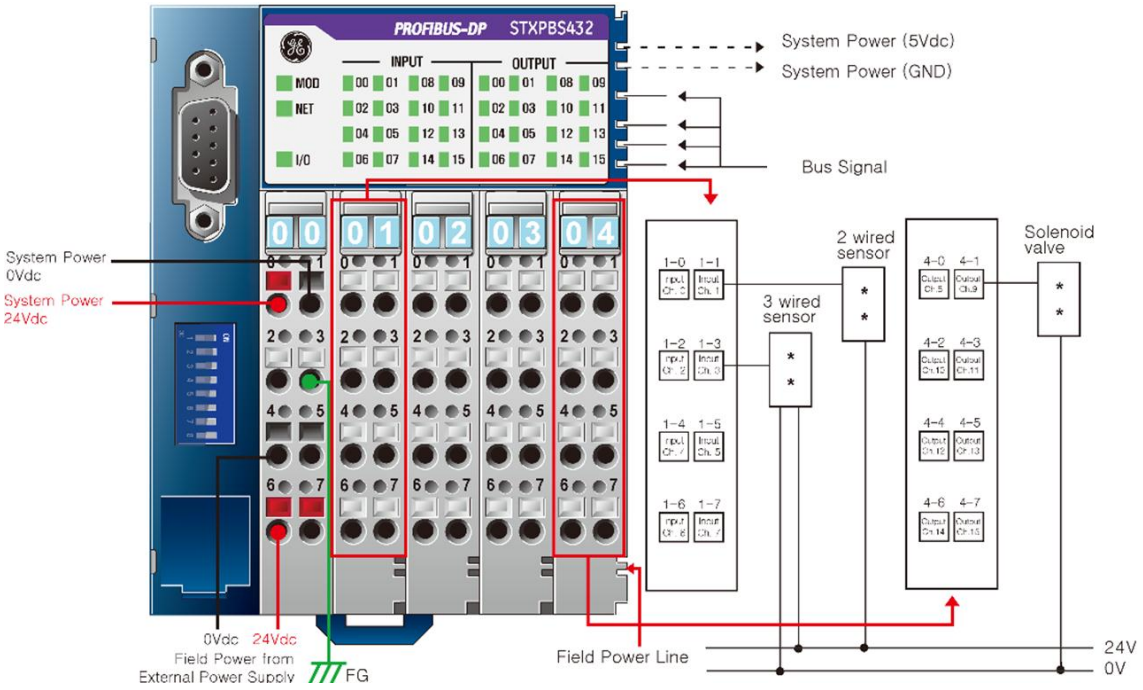



***Figure 16: PROFIBUS Network Adaptor Module: STXPBS432***

***Table 11: STXPBS432: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Output Channel 0 |
| 01-1 | Input Channel 1 | 03-1 | Output Channel 1 |
| 01-2 | Input Channel 2 | 03-2 | Output Channel 2 |
| 01-3 | Input Channel 3 | 03-3 | Output Channel 3 |
| 01-4 | Input Channel 4 | 03-4 | Output Channel 4 |
| 01-5 | Input Channel 5 | 03-5 | Output Channel 5 |
| 01-6 | Input Channel 6 | 03-6 | Output Channel 6 |
| 01-7 | Input Channel 7 | 03-7 | Output Channel 7 |
| 02-0 | Input Channel 8 | 04-0 | Output Channel 8 |
| 02-1 | Input Channel 9 | 04-1 | Output Channel 9 |
| 02-2 | Input Channel 10 | 04-2 | Output Channel 10 |
| 02-3 | Input Channel 11 | 04-3 | Output Channel 11 |
| 02-4 | Input Channel 12 | 04-4 | Output Channel 12 |
| 02-5 | Input Channel 13 | 04-5 | Output Channel 13 |
| 02-6 | Input Channel 14 | 04-6 | Output Channel 14 |
| 02-7 | Input Channel 15 | 04-7 | Output Channel 15 |

### 3.2.1.8 STXPBS532 – Adapter with 16 Negative Logic in/16 Negative Logic

The following figure shows the interface diagram for STXPBS532.

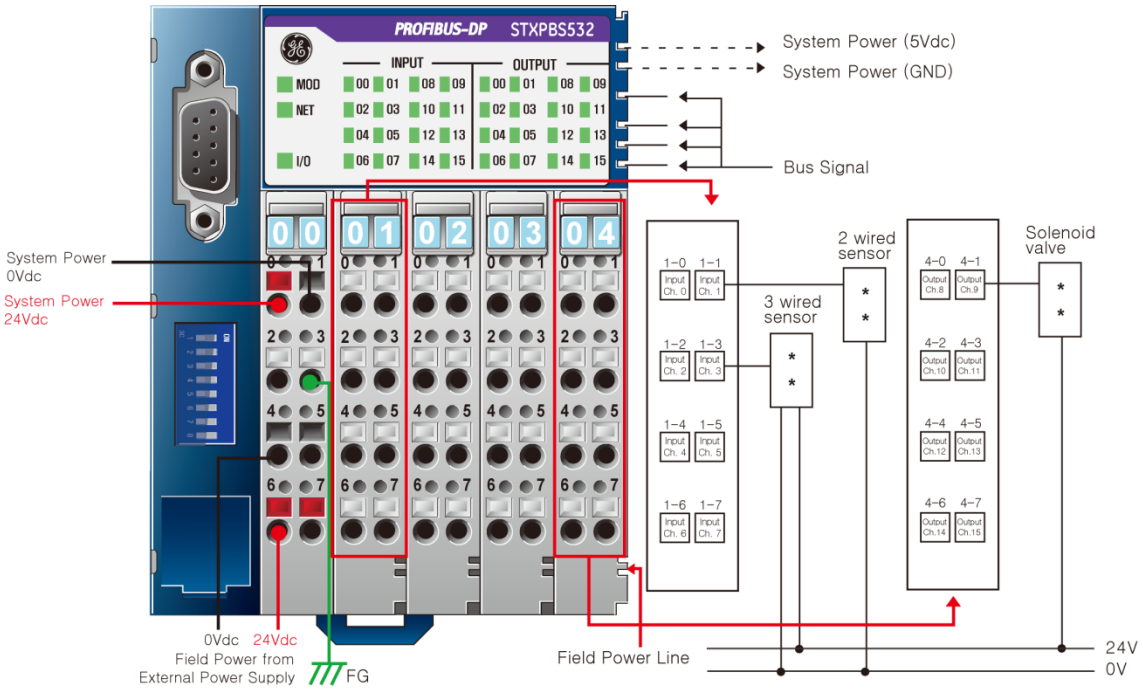



*Figure 17: PROFIBUS Network Adaptor Module: STXPBS532*

*Table 12: STXPBS532: Pin Description*

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Output Channel 0 |
| 01-1 | Input Channel 1 | 03-1 | Output Channel 1 |
| 01-2 | Input Channel 2 | 03-2 | Output Channel 2 |
| 01-3 | Input Channel 3 | 03-3 | Output Channel 3 |
| 01-4 | Input Channel 4 | 03-4 | Output Channel 4 |
| 01-5 | Input Channel 5 | 03-5 | Output Channel 5 |
| 01-6 | Input Channel 6 | 03-6 | Output Channel 6 |
| 01-7 | Input Channel 7 | 03-7 | Output Channel 7 |
| 02-0 | Input Channel 8 | 04-0 | Output Channel 8 |
| 02-1 | Input Channel 9 | 04-1 | Output Channel 9 |
| 02-2 | Input Channel 10 | 04-2 | Output Channel 10 |
| 02-3 | Input Channel 11 | 04-3 | Output Channel 11 |
| 02-4 | Input Channel 12 | 04-4 | Output Channel 12 |
| 02-5 | Input Channel 13 | 04-5 | Output Channel 13 |
| 02-6 | Input Channel 14 | 04-6 | Output Channel 14 |
| 02-7 | Input Channel 15 | 04-7 | Output Channel 15 |

### 3.2.1.9 STXPBS824 – Adapter with 16 Positive Logic in/8 relay out

The following figure shows the interface diagram for STXPBS824.

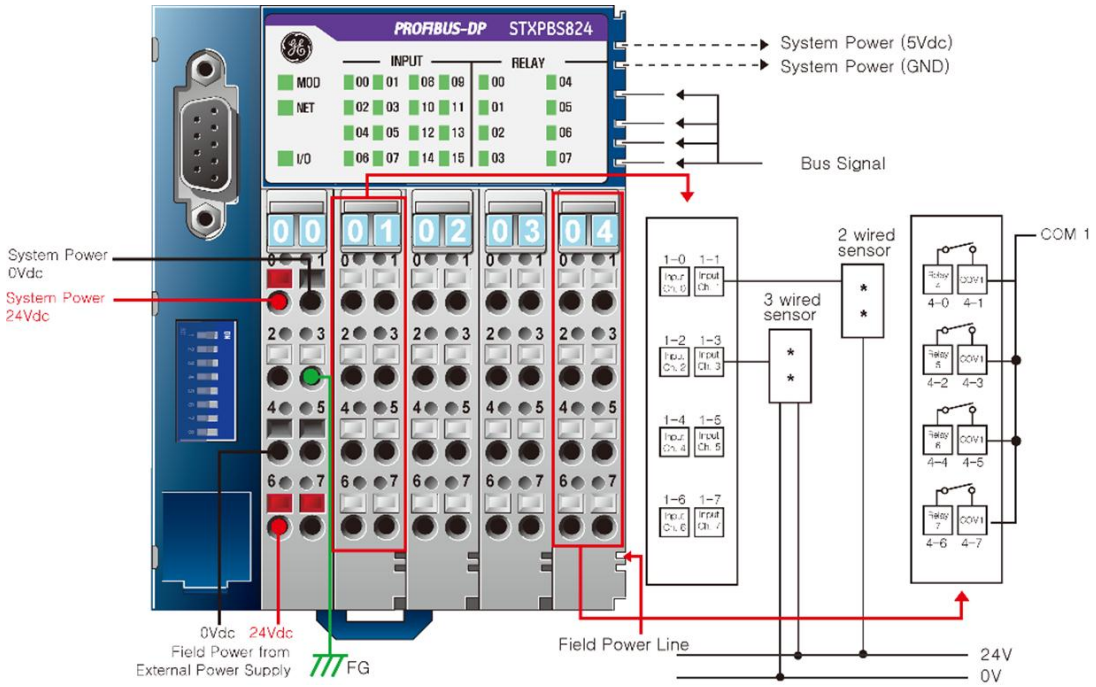



*Figure 18: PROFIBUS Network Adaptor Module: STXPBS824*

*Table 13: STXPBS824: Pin Description*

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Relay Output 0 |
| 01-1 | Input Channel 1 | 03-1 | COM 0 |
| 01-2 | Input Channel 2 | 03-2 | Relay Output 1 |
| 01-3 | Input Channel 3 | 03-3 | COM 1 |
| 01-4 | Input Channel 4 | 03-4 | Relay Output 2 |
| 01-5 | Input Channel 5 | 03-5 | COM 2 |
| 01-6 | Input Channel 6 | 03-6 | Relay Output 3 |
| 01-7 | Input Channel 7 | 03-7 | COM 3 |
| 02-0 | Input Channel 8 | 04-0 | Relay Output 4 |
| 02-1 | Input Channel 9 | 04-1 | COM 4 |
| 02-2 | Input Channel 10 | 04-2 | Relay Output 5 |
| 02-3 | Input Channel 11 | 04-3 | COM 5 |
| 02-4 | Input Channel 12 | 04-4 | Relay Output 6 |
| 02-5 | Input Channel 13 | 04-5 | COM 6 |
| 02-6 | Input Channel 14 | 04-6 | Relay Output 7 |
| 02-7 | Input Channel 15 | 04-7 | COM 7 |

### 3.2.1.10 STXPBS924 – Adapter with 16 Negative Logic in/8 relay out

The following figure shows the interface diagram for STXPBS924.

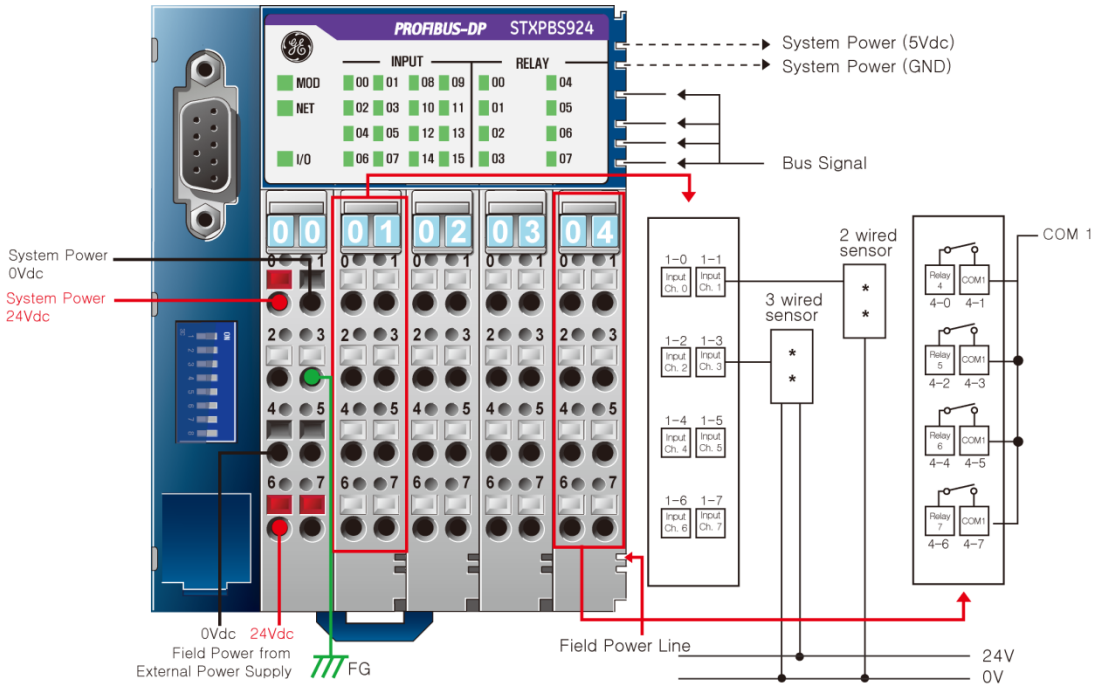



*Figure 19: PROFIBUS Network Adaptor Module: STXPBS924*

*Table 14: STXPBS924: Pin Description*

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Relay Output 0 |
| 01-1 | Input Channel 1 | 03-1 | COM 0 |
| 01-2 | Input Channel 2 | 03-2 | Relay Output 1 |
| 01-3 | Input Channel 3 | 03-3 | COM 0 |
| 01-4 | Input Channel 4 | 03-4 | Relay Output 2 |
| 01-5 | Input Channel 5 | 03-5 | COM 0 |
| 01-6 | Input Channel 6 | 03-6 | Relay Output 3 |
| 01-7 | Input Channel 7 | 03-7 | COM 0 |
| 02-0 | Input Channel 8 | 04-0 | Relay Output 4 |
| 02-1 | Input Channel 9 | 04-1 | COM 1 |
| 02-2 | Input Channel 10 | 04-2 | Relay Output 5 |
| 02-3 | Input Channel 11 | 04-3 | COM 1 |
| 02-4 | Input Channel 12 | 04-4 | Relay Output 6 |
| 02-5 | Input Channel 13 | 04-5 | COM 1 |
| 02-6 | Input Channel 14 | 04-6 | Relay Output 7 |
| 02-7 | Input Channel 15 | 04-7 | COM 1 |

### 3.2.1.11 STXPBS825 – Adapter with 16 Positive Logic in/8 relay out isolated

The following figure shows the interface diagram for STXPBS825.

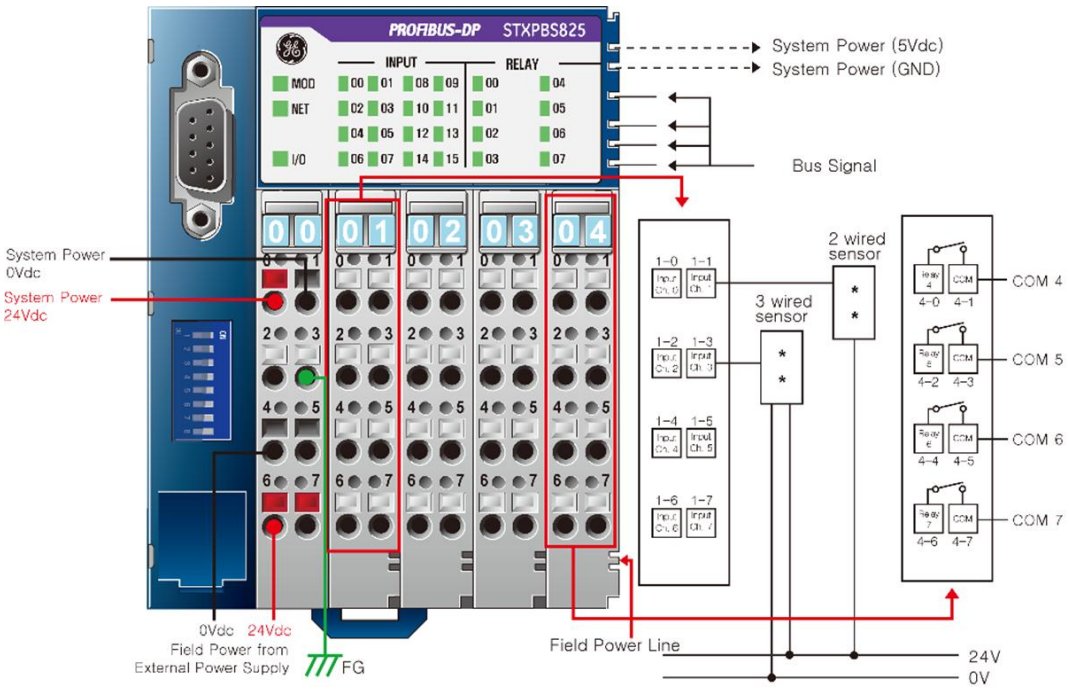



***Figure 20: PROFIBUS Network Adaptor Module: STXPBS825***

***Table 15: STXPBS825: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Relay Output 0 |
| 01-1 | Input Channel 1 | 03-1 | COM 0 |
| 01-2 | Input Channel 2 | 03-2 | Relay Output 1 |
| 01-3 | Input Channel 3 | 03-3 | COM 1 |
| 01-4 | Input Channel 4 | 03-4 | Relay Output 2 |
| 01-5 | Input Channel 5 | 03-5 | COM 2 |
| 01-6 | Input Channel 6 | 03-6 | Relay Output 3 |
| 01-7 | Input Channel 7 | 03-7 | COM 3 |
| 02-0 | Input Channel 8 | 04-0 | Relay Output 4 |
| 02-1 | Input Channel 9 | 04-1 | COM 4 |
| 02-2 | Input Channel 10 | 04-2 | Relay Output 5 |
| 02-3 | Input Channel 11 | 04-3 | COM 5 |
| 02-4 | Input Channel 12 | 04-4 | Relay Output 6 |
| 02-5 | Input Channel 13 | 04-5 | COM 6 |
| 02-6 | Input Channel 14 | 04-6 | Relay Output 7 |
| 02-7 | Input Channel 15 | 04-7 | COM 7 |

### 3.2.1.12 STXPBS925 – Adapter with 16 Negative Logic in/8 relay out isolated

The following figure shows the interface diagram for STXPBS925.

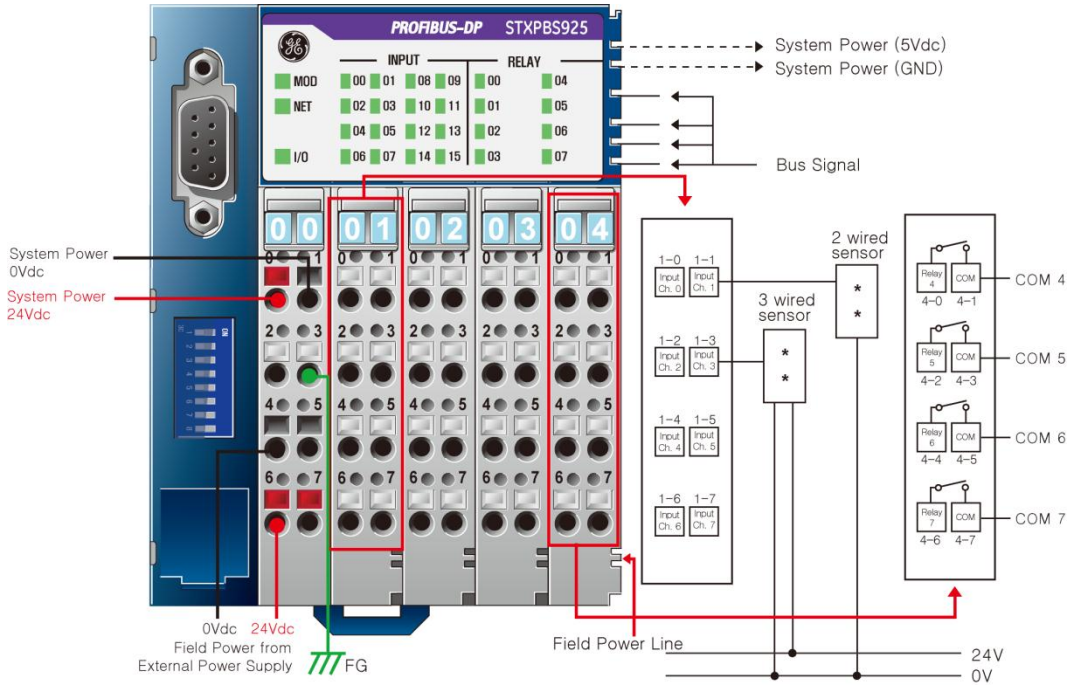



***Figure 21: PROFIBUS Network Adaptor Module: STXPBS925***

***Table 16: STXPBS925: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 01-0 | Input Channel 0 | 03- 0 | Relay Output 0 |
| 01-1 | Input Channel 1 | 03-1 | COM 0 |
| 01-2 | Input Channel 2 | 03-2 | Relay Output 1 |
| 01-3 | Input Channel 3 | 03-3 | COM 1 |
| 01-4 | Input Channel 4 | 03-4 | Relay Output 2 |
| 01-5 | Input Channel 5 | 03-5 | COM 2 |
| 01-6 | Input Channel 6 | 03-6 | Relay Output 3 |
| 01-7 | Input Channel 7 | 03-7 | COM 3 |
| 02-0 | Input Channel 8 | 04-0 | Relay Output 4 |
| 02-1 | Input Channel 9 | 04-1 | COM 4 |
| 02-2 | Input Channel 10 | 04-2 | Relay Output 5 |
| 02-3 | Input Channel 11 | 04-3 | COM 5 |
| 02-4 | Input Channel 12 | 04-4 | Relay Output 6 |
| 02-5 | Input Channel 13 | 04-5 | COM 6 |
| 02-6 | Input Channel 14 | 04-6 | Relay Output 7 |
| 02-7 | Input Channel 15 | 04-7 | COM 7 |

### 3.2.2 STXPBS* Specifications

***Table 17: STXPBS*: Interface Specifications***

| Item | Specification |
|---|---|
| Network Type | PROFIBUS-DP |
| Network Cable | PROFIBUS-DP Special Cable |
| Cable Length | 1.2Km ~ 100m |
| Maximum Station No. | 99 Station (Include Master Scanner) |
| Station Type | PROFIBUS-DP Slave |
| Expansion No. | Maximum 32 Module |
| Baud rate Setting | Support Auto-baud rate |
| Station No. Setting | Dip Switch(0~99) |
| I/O Data Size | Total : Input 36 bytes / Output 36bytes<br>- Input 4 bytes / Output 4 bytes for Base Module<br>- Input 32 bytes / Output 32 bytes for IO Module<br>Max. Discrete I/O : Input 256 Points / Output 256 Points<br>Max. Analog I/O : Input 16 channels / Output 16 Channels |
| Indicators | 1 green/red Module Status Indicator<br>1 green Network Status Indicator<br>1 green/red IO Module Status indicator |
| Baud Rate | 9.6K~12M (1.2Km~100m) (Auto baud rate Selection) |
| Module Location | First module of RSTi system |
| Station type | Slave |
| Repeater Control Signal | TTL |
| Freeze mode | Supported |
| Sync mode | Supported |
| Auto baud rate | Supported |
| Fail safe mode | Supported |

***Table 18: STXPBS*: General Specifications***

| Item | Specification |
|---|---|
| System Power | Supply voltage : 24Vdc nominal<br>Supply voltage range : 19.2~28.8Vdc<br>Protection : Current limit, Reverse polarity protection |
| Power Dissipation | 50mA typical @24Vdc |
| Current for I/O Module | 0.4A @5Vdc |
| Isolation | System Power to internal logic: Non-isolation, Internal logic to I/O driver: Isolation |
| Field Power | Supply voltage : 24Vdc nominal<br>Supply voltage range : 11~28.8Vdc |
| Max. Current Field Power Contact | Maximum 6A@24Vdc |
| Weight | Maximum 340g |
| Module Size | 83mm x 99mm x 70mm |
| Vibration/shock resistance | IEC 60068-2-6:1995 |
| EMC resistance burst/ESD | EMC Directive |
| Installation Pos. / Protect. Class | Variable/IP20 |
| Product Certifications | $_{c}UL_{us}$, CE, ATEX, UL Hazloc |
| Atmosphere | No excessive dust , No corrosive gases |
| Mount | DIN-Rail |
| Environment Condition | See “Environmental Specifications" in Appendix A. |

### Table 19: STXPBS* Input/Output/Relay Module Specifications

| Model STXPBS* | 032 | 132 | 232 | 332 | 432 | 532 | 016 | 116 | 824 | 924 | 825 | 925 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Input Specification** | | | | | | | | | | | | |
| Number of Input | 32 Points | | | | 16 Points | | | | 16 Points | | | |
| Type | Positive Logic | Negative Logic | | | Positive Logic | Negative Logic | | | Positive Logic | Negative Logic | Positive Logic | Negative Logic |
| Indicates | 1 LED/ 1 point | | | | | | | | | | | |
| Input Voltage | 24Vdc | 0Vdc | | | 24Vdc | 0Vdc | | | 24Vdc | 0Vdc | 24Vdc | 0Vdc |
| Maximum Off-State Voltage | 5Vdc | | | | 5Vdc | | | | 5Vdc | | | |
| Minimum On-State Voltage | 9Vdc | | | | 9Vdc | | | | 9Vdc | | | |
| Input Signal Delay | < 0.5msec | | | | < 0.5msec | | | | < 0.5msec | | | |
| Input Impedance | About 5.4KΩ | | | | About 5.4KΩ | | | | About 5.4KΩ | | | |
| **Output Specification** | | | | | | | | | | | | |
| Number of Output | | | 32 Points | | 16 Points | | | | | | | |
| Type | | | Negative Logic | Positive Logic | | Negative Logic | | | | | | |
| Output Load Current | | | Maximum 0.5A/1pt, 8A/All | | | | | | | | | |
| Output Voltage | | | 0Vdc | 24Vdc | | 0Vdc | | | | | | |
| Drop Voltage (ON-state) | | | Maximum 0.3Vdc | | | | | | | | | |
| Leakage Current (OFF-state) | | | Maximum 50uA | | | | | | | | | |
| Output Signal Delay | | | < 0.3msec | | | | | | | | | |
| Protection | | | Short protection, Over Temperature protection, Over Current Limit | | | | | | | | | |
| **Relay Output Specification** | | | | | | | | | | | | |
| Number of Output | | | | | | | 16 points | | 8 points | | | |
| Relay Type | | | | | | | Normally Open, Single Pole, Single Throw | | | | | |
| Output Rating | | | | | | | 2A@5~28.8Vdc,250Vac, 0.8A@48Vdc, 0.5A@110Vdc | | | | | |
| Minimum Load | | | | | | | 100uA, 100mVdc/Point | | | | | |
| Minimum On-Stage Voltage Drop | | | | | | | 0.5V@2.0A, Resistive Load, 24Vdc | | | | | |
| Output Delay Time | | | | | | | Maximum 10ms | | | | | |
| Initial Contact Resistance | | | | | | | 30mΩ | | | | | |
| Expected Contact Life | | | | | | | 300K Cycle Resistive, 100K Cycle Inductive | | | | | |
| Common Type | | | | | | | 4 Point /1COM | 1 Point / 1COM | 4 Point / 1 COM | | 1 Point / 1 COM | |
| Isolation | | | | | | | Relay Coil / Contact Isolation | | | | | |

### 3.2.3 LED Indicators

#### 3.2.3.1 Module Status LED (MOD)

***Table 20: Module Status LED***

| Color | Status | Function |
|---|---|---|
| Off | No Power | No power is supplied to the unit. |
| Solid Green | Device Operational | The unit is operating in normal condition. |
| Flashing Green | Device in Standby | The device needs commissioning due to configuration missing, incomplete or incorrect. |
| Flashing Red | Minor Fault | Recoverable Fault |
| Solid Red | Unrecoverable Fault | An unrecoverable fault has occurred in self-testing/ Rotary switch configuration error. |

#### 3.2.3.2 Network Status LED (NET)

***Table 21: Network Status LED***

| Color | Status | Function |
|---|---|---|
| Off | Not Powered,<br>Not On-line | Device is not on-line or may not be powered |
| Flashing Green | On-line,<br>Not connected | Device is on-line but has no connections in the established state<br>– Not allocated to a master |
| Solid Green | On-line,<br>Connected | Device is on-line and allocated to a master. |
| Flashing Red | Connection Time-out | One or more I/O connections are in the time-out state. |
| Solid Red | Critical Communication Failure | Failed communication. |

#### 3.2.3.3 IO Module Status LED (I/O)

***Table 22: IO Module Status LED***

| Color | Status | Function |
|---|---|---|
| Off | Not Powered<br>No IO Module | Device has no IO module or may not be powered |
| Flashing Green | RSTi bus On-line, | RSTi bus is on-line but does not exchange I/O data.<br>– Valid IO module configuration. |
| Solid Green | RSTi bus Connection | IO module is connected and run exchanging I/O data |
| Solid Red | RSTi bus connection fault | One or more IO module occurred in fault state.<br>– Changed IO module configuration.<br>– RSTi bus communication failure. |
| Flashing Red | IO Module Configuration Failed | Failed to initialize IO module<br>– Detected invalid IO module ID.<br>– Overflowed Input / Output Size<br>– Too many IO module<br>– Initial protocol failure<br>– Mismatch vendor code between adapter and IO module. |

#### 3.2.3.4 Field Power Status LED

***Table 23: STXPBS001: Field Power Status LED***

| Color | Status | Function |
|---|---|---|
| Off | Not Supplied Field Power | Not supplied 24V dc field power |
| Solid Green | Supplied Field Power | Supplied 24V dc field power |

### 3.2.4 Dimensions

#### 3.2.4.1 STXPBS001 Dimension

The following figure displays the dimension for STXPBS001.

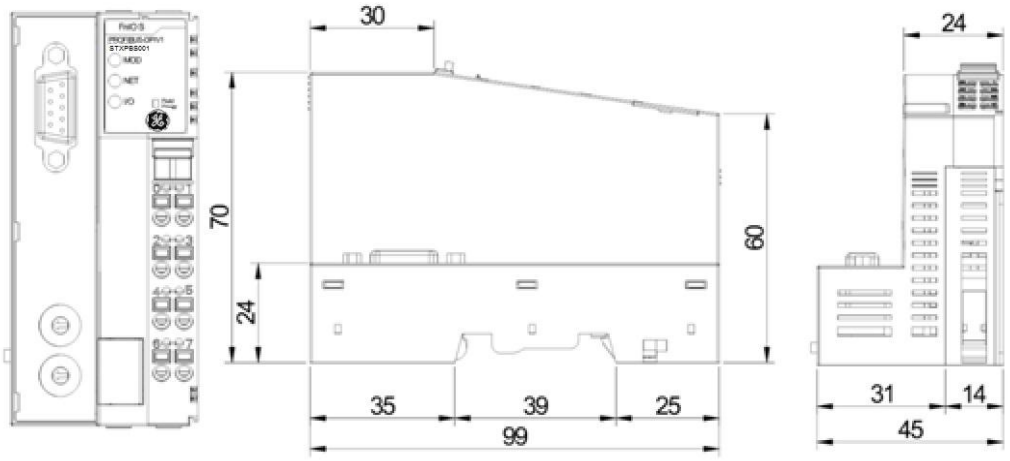



***Figure 22: Dimension for STXPBS001***

#### 3.2.4.2 STXPBS* Dimension

The following figure displays the dimension for STXPBS*.

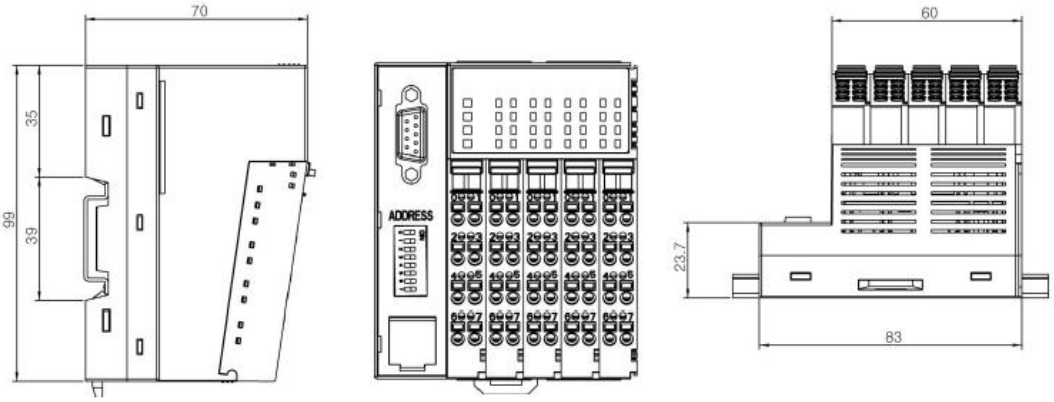



***Figure 23: Dimension for STXPBS****

#### 3.2.4.3 Total IO

The number of the module assembly that can be connected is 32 for STXPBS001 and 8 for STXPBS*.The maximum length is 426mmm and 179mm respectively. (These maximum length figures are considering all single wide modules. These values need to be adjusted if double wide modules like ST-2748 are considered)

### 3.2.5 PROFIBUS Communication Interface

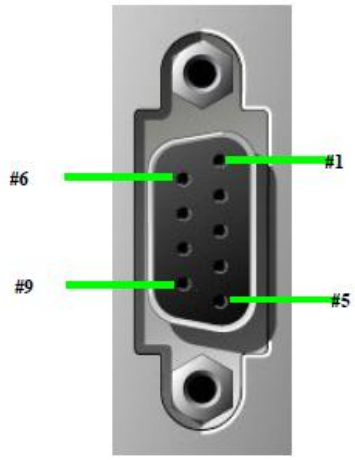



***Figure 24: PROFIBUS Adapter Communication interface***

The following table describes the Signal Name and Description.

***Table 24: Signal name and Description***

| *No.* | *Name* | *Description* |
|---|---|---|
| 1. | FG | |
| 2. | - | |
| 3. | RXD/TXD-P | Receive/Transmit data-plus (B wire) |
| 4. | CNTR-P | Repeater control signal (direction control), RTS signal |
| 5. | DGND | Data ground (reference potential for VP) |
| 6. | VP | Supply voltage-Plus (P5V) |
| 7. | - | |
| 8. | RXD/TXD-N | Receive/Transmit data-minus (A-wire) |
| 9. | CNTR-N | Repeater Control Signal (direction control) |

All FieldBus devices which use a standard 9-pin Sub-D connector should provide the VP and DGND signals on the bus connector in addition to receive and transmit signals. With all other connector types, only receive and transmit signals need to be connected.

Make sure that the connector type used is suitable for the selected baud rate.

If optional signals are provided, they must also comply with EN50170 Volume 2 and they must be correctly described in the respective GSD file.

To prevent EMC interface from entering the device, the cable shield should be connected to the functional ground of the device (generally the electrically conductive case). This is done by connecting the cable shield to the metal case of the Sub-D connector and the functional ground over a larger area. The bus connector must have a low-impedance connection to the cable shield.

The data transfer technology of the serial bus system, which uses a shielded twisted pair data cable, is described in the specification of the interface-immune RS 485 interface standard. To allow correct bus termination, each station must connect the signals DGND and VP (5V) to pins 5 and 6 of the connector respectively. The 5V supply for the terminating resistors (VP) should have a minimum current rating of 10mA (the current load can increase to 12mA if a NULL signal is sent through the bus). The current rating should be increased to approximately 90mA if you need to supply other types of devices on the bus such as bus terminals and optical fiber cable drivers. Due to the capacitive load of the station and the resulting cable reflections, bus connectors should be provided with built-in series inductors.

**Caution**

**The use of an incorrect supply voltage or frequency can cause severe damage to the component.**

### 3.2.6 Choice of PROFIBUS data transfer cable type

- Depending on the application, the user can choose between electrical and optical fiber data transfer cables. The following types of electrical data cables can be used:
  - Standard bus cable
  - Standard bus cable with halogen-free sheath (type FRNC)
  - Cable with PE Sheath for use in the food and manufacturing industries. (It differs from the standard bus cable solely in the cable sheath).
  - Direct buried cable with additional protective sheath for lying in the ground.
  - Trailing cable: This is a special cable type which is used where parts of the machine move occasionally or continuously.
  - Festooned cable: Compared to a trailing cable, a festooned cable has an additional strain relief element.
- The bus cable is specified in EN 50170 part 8-2 as "Cable Type A", and should comply with the parameters in the following table. Cable Type B, which is also described in EN 50170, is outdated and should no longer be used.
- Parameters for standard type A bus cables:

***Table 25: Parameters for Standard Type A Bus Cables***

| ***Parameter*** | ***Cable Type A*** |
|---|---|
| Characteristic impedance in Ω | 135..165 at a frequency of (3..20MHz) |
| Operating capacity(pF/m) | < 30 |
| Loop resistance (Ω/km ) | <=110 |
| Core diameter (mm) | >0.64* |
| Cora cross-section (mm) | >0.34* |

* The cable cross-sections used should be compatible with the mechanical specifications of the bus interface connector.

The cable parameters specified for standard Type A bus cables result in the maximum length of each bus segment for the respective data transfer rate as shown in the below table.

- Maximum Cable Lengths per Segments

***Table 26: Maximum Cable Lengths per Segments***

| ***Baud rate*** | ***9.6*** | ***19.2*** | ***45.45*** | ***93.75*** | ***187.5*** | ***500*** | ***1500*** | ***3000*** | ***6000*** | ***12000*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Maximum segment Length in 'm'(m) | 1200 | 1200 | 1200 | 1200 | 1000 | 400 | 200 | 100 | 100 | 100 |

**Note:** In a PROFIBUS-DP/FMS installation, you must choose a data transfer rate which is supported by all devices connected to the bus. The chosen data transfer rate then determines the maximum segment lengths as shown above.

The maximum admissible distance between two bus stations in each PROFIBUS network can be calculated as follows:

(NO_REP+1)*Segment length,
Where NO_REP =The maximum number of repeaters connected in series (depends on repeater type).

**Example**: The repeater manufacture specifications allow nine repeaters to be connected in series. The maximum distance between two bus stations at a data transfer rate of 1500 kbit/s is then as follow:

(9+1)*200m=2000 m

### 3.2.7 PROFIBUS Module Configuration

#### 3.2.7.1 System and Field Power cable wiring

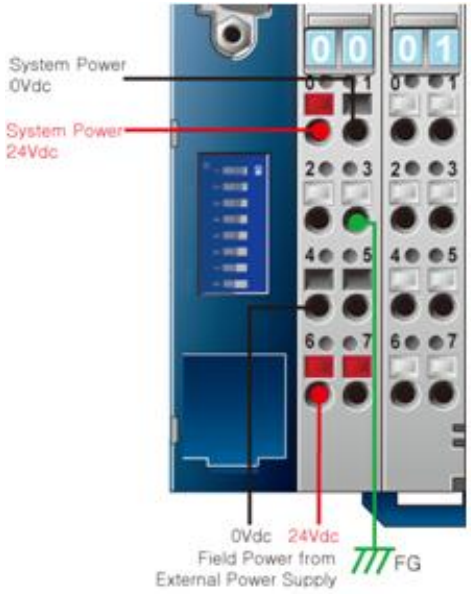


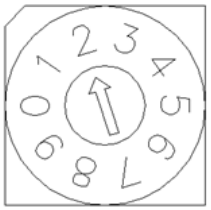

***Figure 25: system & field power connection***

1. For safety, supply system power and field power should be separated.
   - System Power: for System & PROFIBUS communications
   - Field Power: for I/O field device connections
2. Make sure power supplies for system power and field power are supplied separately.
3. Use PROFIBUS certified cables only.
4. Do not insert any other devices or components (such as transistor) into PROFIBUS field bus besides PROFIBUS qualified products.

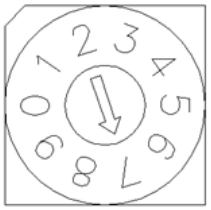
### 3.2.7.2 Station Address and Quick Startup Mode Setup

#### Station Address Setup for STXPBS001

Each PROFIBUS Adapter must have a unique address (from 1 to 99) so that it can be addressed independently from other nodes. The address 0 is reserved to identify a broadcast exchange. No response is returned to broadcast requests sent by the master.




X 10 (MSD)




X 1 (LSD)

***Figure 26: MAC ID of a slave node***

The above figure shows MAC ID 27(=2*10 + 7*1) of a slave node.

Note that if the station number is once set and an attempt is made to change the station number, it would result in communication errors. Power cycle the module and download the new assigned station number to restore communication.

- Communication Speed Setting
  - Refer to GEIP PROFIBUS master module settings to change the communication speed.

### Station Address Setup for STXPBS*

Each PROFIBUS Adapter must have a unique Node Station address (from 0 to 99) so that it can be addressed independently from other nodes.

The figure below shows Dip Switch #1~7 setting.

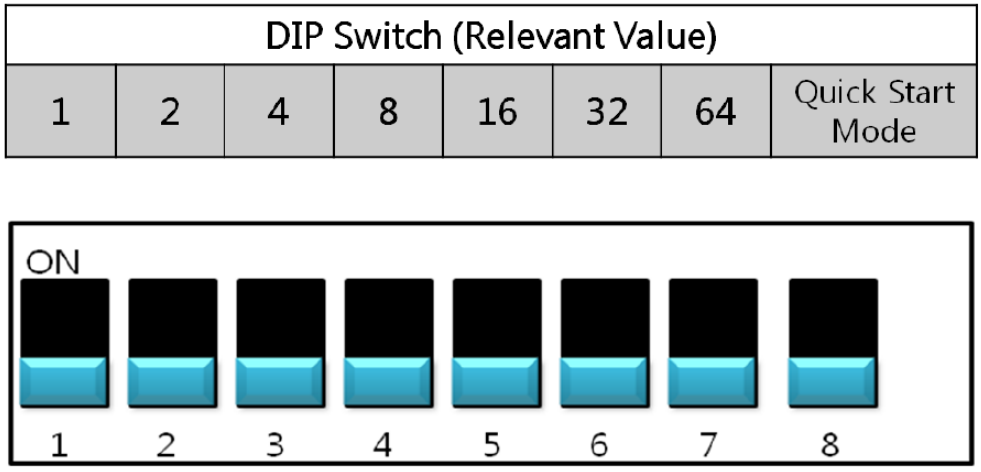



***Figure 27: DIP Switch***

- Node Station Address Setting Example

In order to change station ID to No. 20 (Bin 10100), Dip switch No.3 and 5 must be ON and others must be OFF.

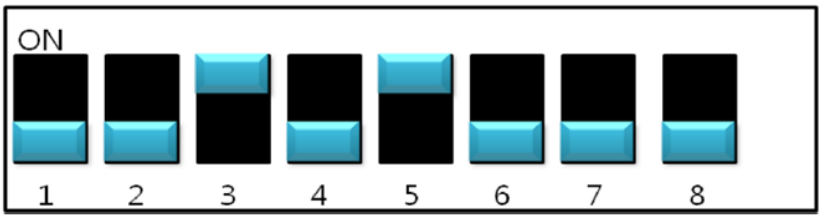



***Figure 28: Node Station Address Setting***

- Mode Setting

***Table 27: Mode Setting***

| ***Dip #8.*** | ***Start Mode*** |
|---|---|
| OFF | Normal Booting |
| ON | Quick Booting |

**Note:** Directions for setting Node Number (Station number)

1. Select address within the range of 00 to 99 (Station no. 00~99)
2. Station number setting out of the range will cause communication error.
3. Duplicating Station No. will cause communication error

### 3.2.7.3 Adding GSD file

GSD (Electronic data sheet of a device) files contain and describe the functions and characteristics of PROFIBUS devices. The abbreviation GSD means Generic Station Description (Device Base Files). All the available GSD files together form the device database.

When Proficy machine edition/ configuration tool is started, the system configurator automatically retrieves all the GSD files stored in the GSD directory.

The device names are placed into an internal list. During the configuration, the device-specific data is retrieved directly from the GSD files.

If a DP Slave device does not appear in the selection list, a corresponding GSD file can be added as shown below:

Right click on the GEIP PROFIBUS master and choose “add slave”, a pop up window will open showing the available slave modules.

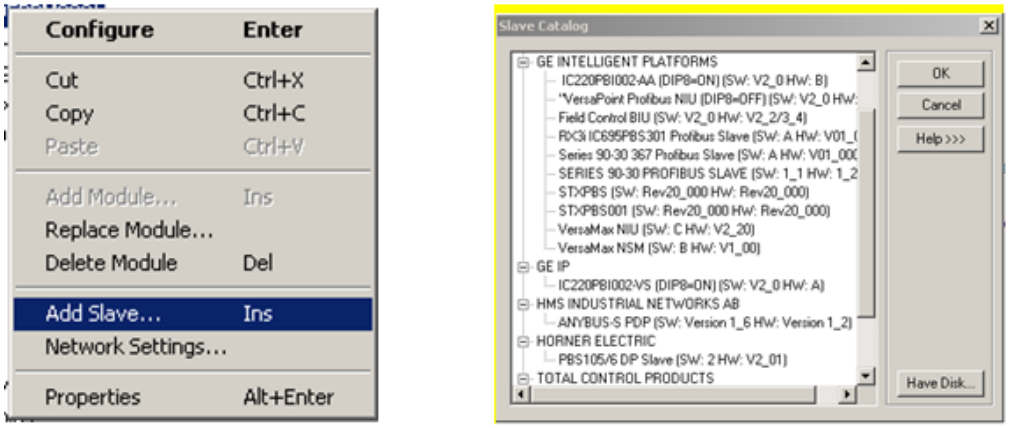



***Figure 29: Adding slave modules***

Choose the desired slave device or choose “Have Disk” to add other slave devices. Now click on “Toolchest”, choose “PROFIBUS Devices”, select the desired network adapter and hit F1 to see the contents of the GSD file. For latest GSD file, please visit GE-IP support site.

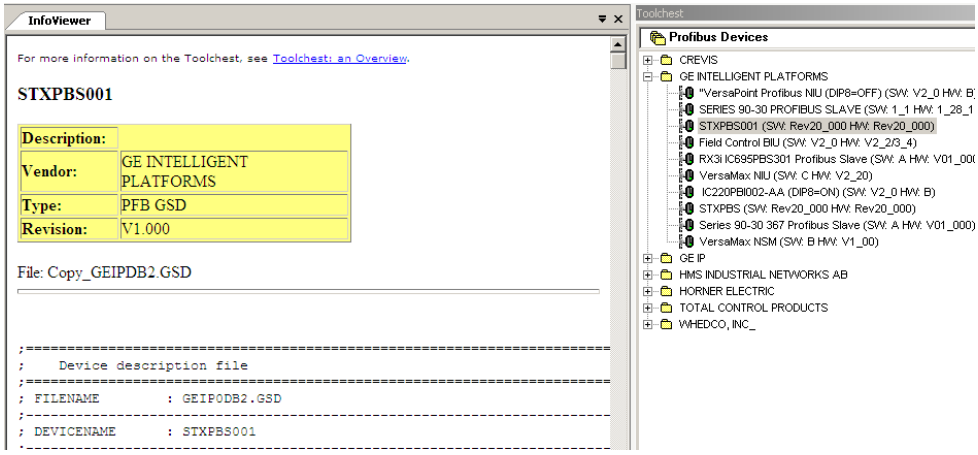
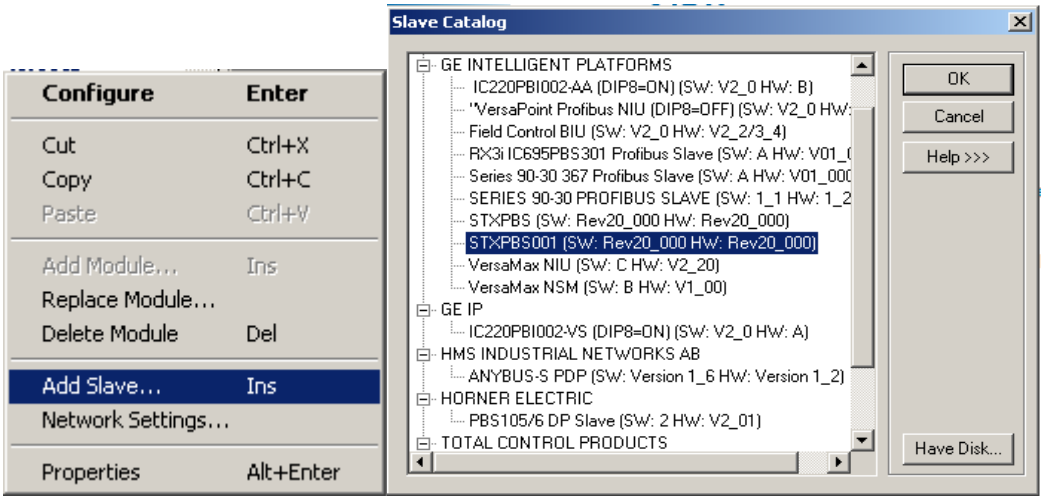



***Figure 30: Contents of GSD file***

### 3.2.8 Configuring an I/O Station for PROFIBUS Communication

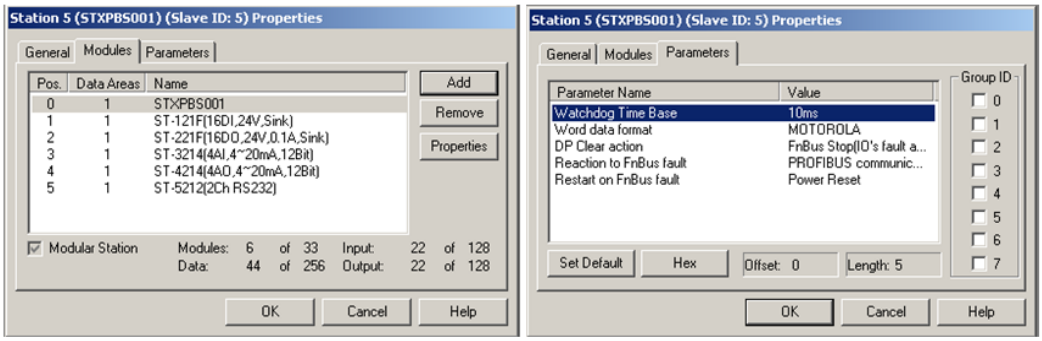
To configure I/O station, add a GE-IP PROFIBUS master module at the desired slot in the Rx3i or 90-30 Proficy Machine Edition project. Ensure that you have the latest GSD file imported. Right click on the master module and choose “Add Slave”. Select “STXPBS001” for PROFIBUS Network Adapter or STXPBS for all-in-one PROFIBUS Network Adapter. Select “OK”.




A pop-up menu will appear which can help you in configuring the I/O station along with the I/O modules.

1. Assign a name, description and station address for the I/O station.
2. Select the Modules tab and add the desired I/O modules as per the application. Ensure that the first module is always STXPBS001 or STXPBS* (in case you have selected network adapter as STXPBS) at position”0”.

   At least one I/O module must be configured for successful PROFIBUS communication.
3. Go to the Parameters tab and select the parameters according to the application. The Parameters tab is as shown below:

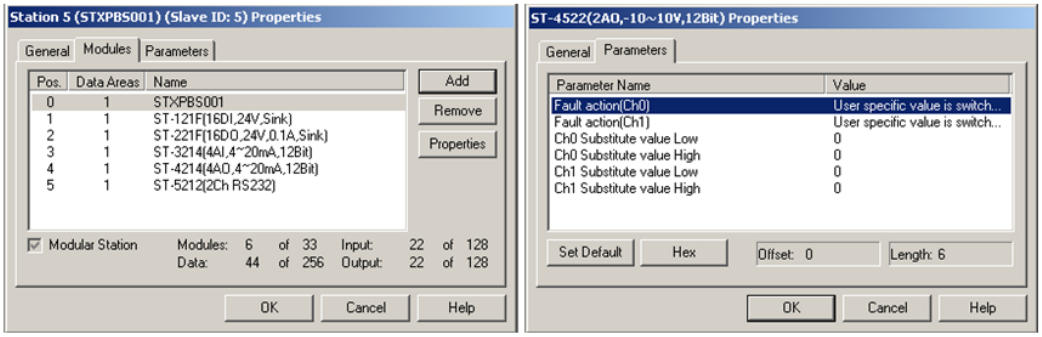


Five parameters can be configured as follows:

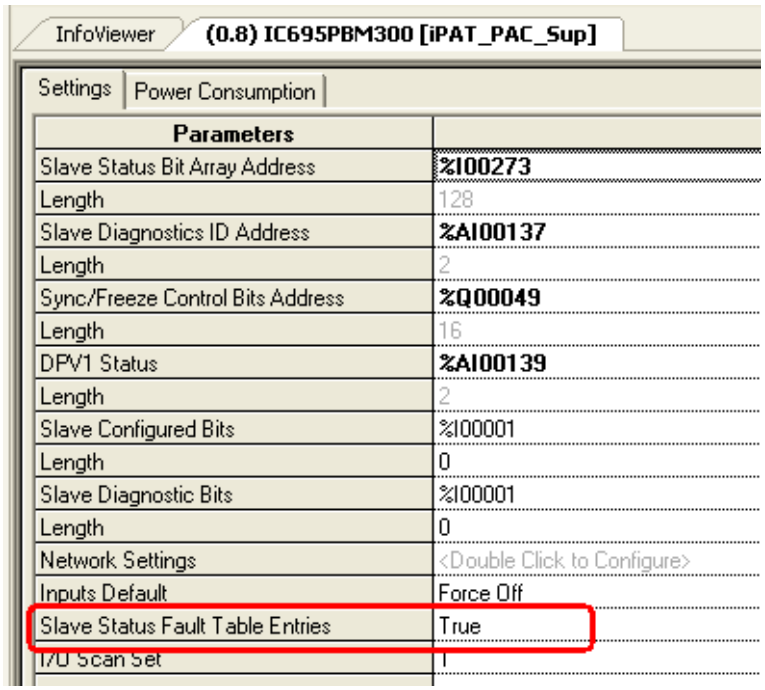
1. **Watchdog time base**: The watchdog timer can be used for detection of a network fault. If the Network Adapter detects a network error within the watchdog time, STXPBS001 will control slots depending on the values in DP Clear Action. Options are 10ms and 1ms.
2. **Word Data Format**: The options are MOTOROLA & INTEL.

   *MOTOROLA* (big endian): The Swap Bytes parameter must be set to False for the IO modules connected to the node.

   *INTEL* (little endian): The Swap Bytes parameter must be set to true for the IO modules connected to the node.
3. **DP Clear Action**: If a network fault is detected within the specified watchdog time base, the outputs of an I/O station will acquire values as per the options specified in DP clear action. The options are:
   a. *Bus Stop (I/O Fault action)*: The communication between STXPBS001 and modules will be stopped and each module will control its IO Data according to the Fault Action selected for it. The Bus status will be ready (IO status LED will blink). To configure the I/O module for fault action, go to the Modules tab and select Properties. The example below uses an ST-4522 module. Note that substitute value low or high denotes low or high byte values.




   b. *Bus Run (Clear output)*: The communication between STXPBS001 and modules will run. All the modules' outputs will be set to 0. The IO status LED will be green.
   c. *Bus Run (Hold output)*: The communication between STXPBS001 and modules will run. All module outputs will hold the last value but bus will run. The IO status LED will be green.
4. **Reaction to Bus Fault:** If Bus error is detected, the behavior of the network module will be as per the options selected below. It should be noted that "Restart to Bus Fault" should be set to "Power restart" for this parameter to behave appropriately. Note that in order to observe a "loss of Device" in IO fault table , the "slave status Fault table entries" must be set to "true" in the GE IP PROFIBUS master settings tab as shown below:




a. *PROFIBUS Communication*: Last input values will not hold. NET LED will be blinking Green. Network adaptor communication with master stops. IO LED will be red and fault “Loss of device' logged in I/O fault table.

b. *Clear Input Data*: Input values will be zero. NET LED will be Green. Network adaptor communication with master intact. IO LED will be red and fault “Loss of device' logged in I/O fault table.

c. *Stay with last Input data*: Input values will be holding. NET LED will be Green. Network adaptor communication with master intact. IO LED will be red and fault “Loss of device' logged in I/O fault table.

5. **Restart on Bus Fault**: If Bus error is detected, the network module will power up depending upon the options selected for this parameter. The options are “Power restart” & “Auto restart”.

It should be noted that only (1. Watch dog time base) and (4. Reaction to Bus Fault) are applicable for STXPBS* (Network adapter with Integrated IO modules).

Apart from these settings, for Analog output modules, serial modules, digital output modules etc., select the module at the “modules” tab and choose properties for additional settings. Refer to individual module description for more details.

#### 3.2.8.1 DPV1 services to read write network adapter configuration parameters.

The PROFIBUS network adapter also supports DPV1 service. The details are as below:

#### 3.2.8.2 DPV1 Write service

- Slot#=0, Index 1: Write STXPBS001 extension parameter(2Byte)
- Slot#0~31, Index 1: Write parameter for an IO module.
- Slot#0~31, Index 2: Write memory data to an IO module.
- Slot#= 254: Write user data to EEPROM user area
  Index=0~127(Offset in EEPROM user area)
  Data Ln=Length for data to be written
  Data [0] ~Data[n] =User data

List of valid commands for (Slot#=0, Index 1: Write STXPBS001 extension parameter (2 bytes). Note that the length of parameter may vary depending upon the module chosen for STXPBS* Network adapter with Integrated IO modules and hence the command word.

| Command | | Reaction to Bus Fault | DP Clear Action | Word data Format | Restart on Bus fault |
|---|---|---|---|---|---|
| Hex | Binary | | | | |
| 00 00 | 00000000 00000000 | 00: PROFIBUS communication | 00: Bus Stop IO fault action | 00:INTEL | 00:Power reset |
| 00 10 | 00000000 00010000 | 00: PROFIBUS communication | 00: Bus Stop IO fault action | 00:INTEL | 01: auto reset |
| 01 00 | 00000001 00000000 | 00: PROFIBUS communication | 00: Bus Stop IO fault action | 01:MOTOROLA | 00:Power reset |
| 01 10 | 00000001 00010000 | 00: PROFIBUS communication | 00: Bus Stop IO fault action | 01:MOTOROLA | 01: auto reset |
| 00 04 | 00000000 00000100 | 00: PROFIBUS communication | 01: Bus Run ( clear Output) | 00:INTEL | 00:Power reset |
| 00 14 | 00000000 00010100 | 00: PROFIBUS communication | 01: Bus Run ( clear Output) | 00:INTEL | 01: auto reset |
| 01 04 | 00000001 00000100 | 00: PROFIBUS communication | 01: Bus Run ( clear Output) | 01:MOTOROLA | 00:Power reset |
| 01 14 | 00000001 00010100 | 00: PROFIBUS communication | 01: Bus Run ( clear Output) | 01:MOTOROLA | 01: auto reset |
| 00 08 | 00000000 00001000 | 00: PROFIBUS communication | 10: Bus Run ( Hold Output) | 00:INTEL | 00:Power reset |
| 00 18 | 00000000 00011000 | 00: PROFIBUS communication | 10: Bus Run ( Hold Output) | 00:INTEL | 01: auto reset |
| 01 08 | 00000001 00001000 | 00: PROFIBUS communication | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 00:Power reset |
| 01 18 | 00000001 00011000 | 00: PROFIBUS communication | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 01: auto reset |
| 00 01 | 00000000 00000001 | 01: Clear Input data | 00: Bus Stop IO fault action | 00:INTEL | 00:Power reset |
| 00 11 | 00000000 00010001 | 01: Clear Input data | 00: Bus Stop IO fault action | 00:INTEL | 01: auto reset |
| 01 01 | 00000001 00000001 | 01: Clear Input data | 00: Bus Stop IO fault action | 01:MOTOROLA | 00:Power reset |

| Command | | Reaction to Bus Fault | DP Clear Action | Word data Format | Restart on Bus fault |
|---|---|---|---|---|---|
| Hex | Binary | | | | |
| 01 11 | 00000001 00010001 | 01: Clear Input data | 00: Bus Stop IO fault action | 01:MOTOROLA | 01: auto reset |
| 00 05 | 00000000 00000101 | 01: Clear Input data | 01: Bus Run ( clear Output) | 00:INTEL | 00:Power reset |
| 00 15 | 00000000 00010101 | 01: Clear Input data | 01: Bus Run ( clear Output) | 00:INTEL | 01: auto reset |
| 01 05 | 00000001 00000101 | 01: Clear Input data | 01: Bus Run ( clear Output) | 01:MOTOROLA | 00:Power reset |
| 01 15 | 00000001 00010101 | 01: Clear Input data | 01: Bus Run ( clear Output) | 01:MOTOROLA | 01: auto reset |
| 00 09 | 00000000 00001001 | 01: Clear Input data | 10: Bus Run ( Hold Output) | 00:INTEL | 00:Power reset |
| 00 19 | 00000000 00011001 | 01: Clear Input data | 10: Bus Run ( Hold Output) | 00:INTEL | 01: auto reset |
| 01 09 | 00000001 00001001 | 01: Clear Input data | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 00:Power reset |
| 01 19 | 00000001 00011001 | 01: Clear Input data | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 01: auto reset |
| 00 02 | 00000000 00000010 | 10: Stay with last input | 00: Bus Stop IO fault action | 00:INTEL | 00:Power reset |
| 00 12 | 00000000 00010010 | 10: Stay with last input | 00: Bus Stop IO fault action | 00:INTEL | 01: auto reset |
| 01 02 | 00000001 00000010 | 10: Stay with last input | 00: Bus Stop IO fault action | 01:MOTOROLA | 00:Power reset |
| 01 12 | 00000001 00010010 | 10: Stay with last input | 00: Bus Stop IO fault action | 01:MOTOROLA | 01: auto reset |
| 00 06 | 00000000 00000110 | 10: Stay with last input | 01: Bus Run ( clear Output) | 00:INTEL | 00:Power reset |
| 00 16 | 00000000 00010110 | 10: Stay with last input | 01: Bus Run ( clear Output) | 00:INTEL | 01: auto reset |
| 01 06 | 00000001 00000110 | 10: Stay with last input | 01: Bus Run ( clear Output) | 01:MOTOROLA | 00:Power reset |
| 01 16 | 00000001 00010110 | 10: Stay with last input | 01: Bus Run ( clear Output) | 01:MOTOROLA | 01: auto reset |
| 00 0A | 00000000 00001010 | 10: Stay with last input | 10: Bus Run ( Hold Output) | 00:INTEL | 00:Power reset |
| 00 1A | 00000000 00011010 | 10: Stay with last input | 10: Bus Run ( Hold Output) | 00:INTEL | 01: auto reset |
| 01 0A | 00000001 00001010 | 10: Stay with last input | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 00:Power reset |
| 01 1A | 00000001 00011010 | 10: Stay with last input | 10: Bus Run ( Hold Output) | 01:MOTOROLA | 01: auto reset |

#### 3.2.8.3 DPV1 Read service

- Slot#=0, Index 1: Read STXPBS001 extension parameters (2Byte)
- Slot#1~32, Index 1: Read parameter for an IO module.
- Slot#1~32, Index 2: Read memory data from an IO module.
- Slot#=0, Index 254: Read vendor code from EEPROM directly.
- Data Ln=1(Fixed)
  Slot#=0, Index 253: read FW revision
  Data Ln=4(Fixed for STXPBS001), 1(all-in-one modules)
- Slot#=254: read user data from EEPROM user area
  Index=0~127(Offset in EEPROM user area)
  Data Ln=Length for data to be read.

#### 3.2.8.4 Terminator Resistor

The following figure displays the terminator resistor specification.

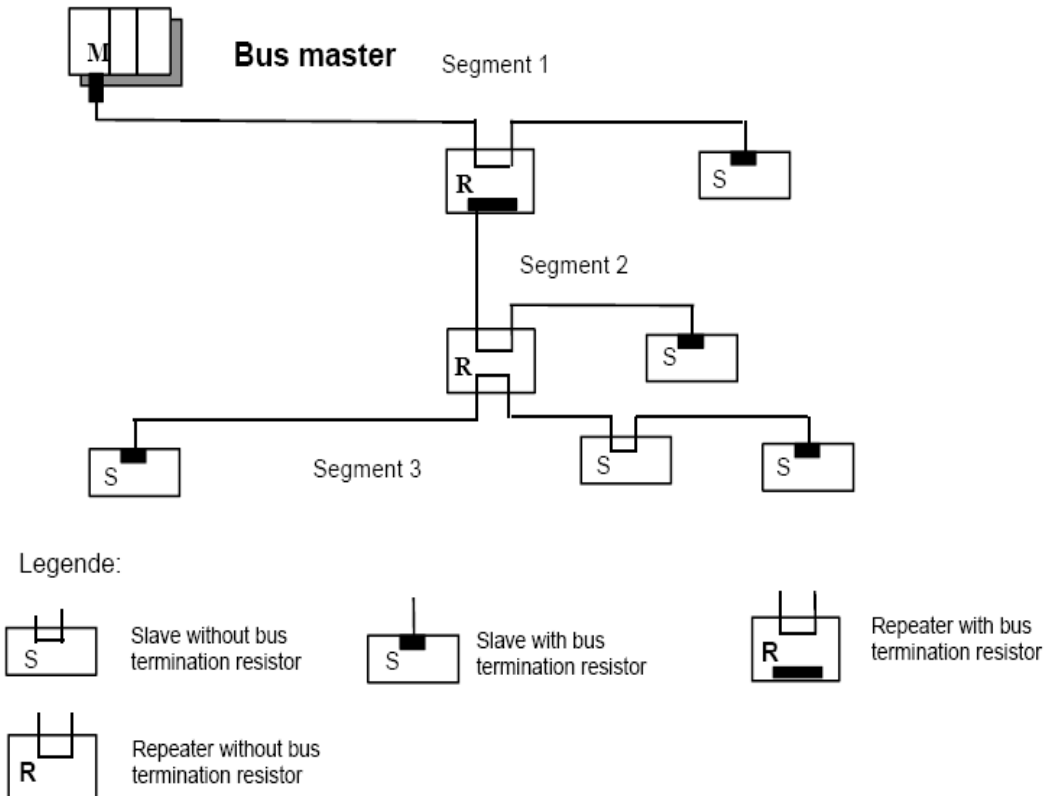



***Figure 31: Terminator Resistor Specification***

In order to minimize cable reflections and ensure a defined noise level on the data lines, the data transfer cable must be terminated at both ends with a terminating resister combination as follows:

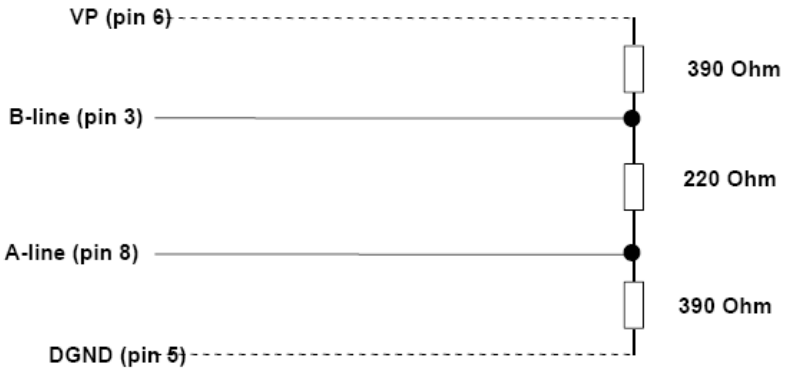



***Figure 32: Terminating Resistor Combination***

### 3.2.9 I/O Process Image Map

An IO module may have three types of data: I/O data, configuration parameter, and memory register. The data exchange between network adapter and IO modules is done by means of an I/O process by RSTi bus protocol.

The following figure shows the data flow between network adapter and IO modules for STXPBS001.

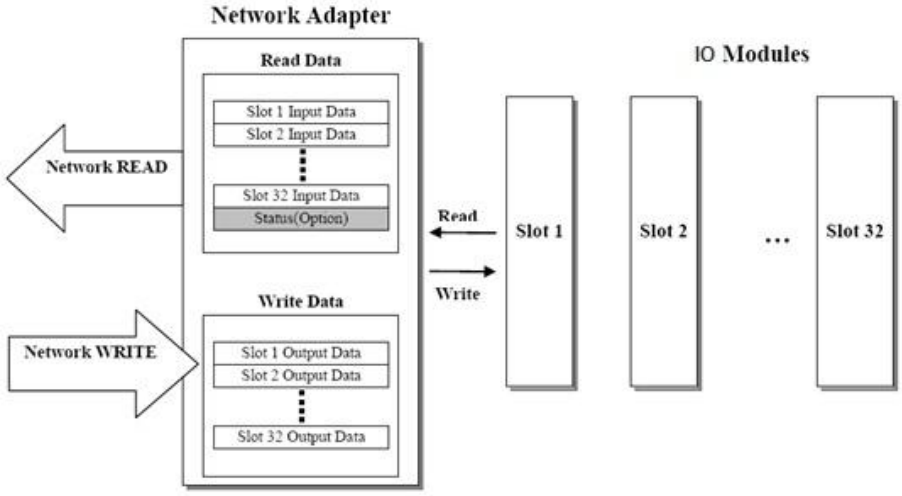



***Figure 33: STXPBS001: Data flow between Network Adapter and IO Modules***

The following figure shows the data flow of process image between network adapter and IO modules for STXPBS*.

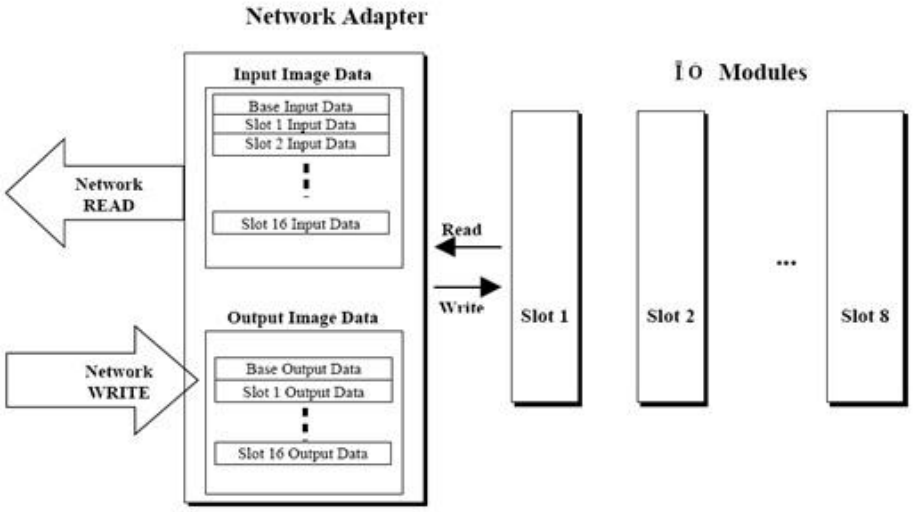



***Figure 34: STXPBS*: Data flow between Network Adapter and IO Modules***

### 3.2.9.1 Example of Input Process Image Map

Input image data depends on slot position and IO Module data type.

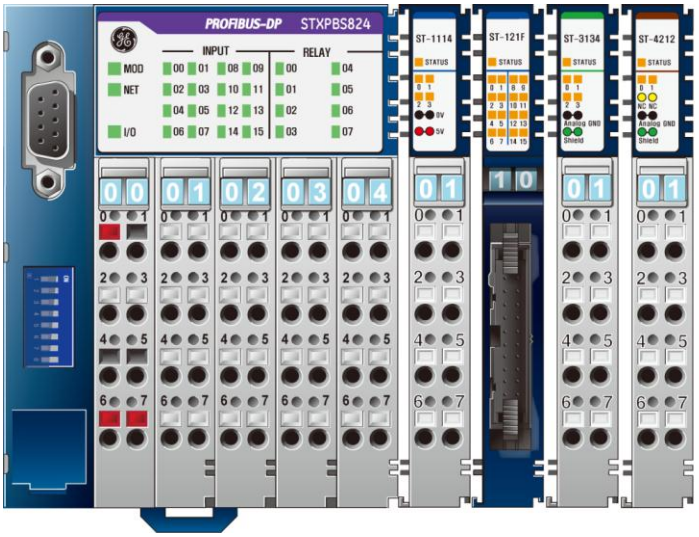



***Figure 35: Slot Configuration***

The following table lists the slot number and module description.

***Table 28: Slot number and Module Description***

| Slot Address | Module Description |
|---|---|
| #0 | STXPBS032<br>32-discrete input (4byte) |
| #1 | 4-discrete Input (4 bit) |
| #2 | 16-discrete Input (2 byte) |
| #3 | 4-analog Input (4 word) |
| #4 | 2-analog output (2 word) |

- Input Process Image Mode (Uncompressed Input Processing Data)

***Table 29: Input Process Image Mode***

| Byte | Slot # | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 0 | 0 (AT2) | 1st input byte (Base IO) | | | | | | | |
| Byte 1 | | 2nd input byte (Base IO) | | | | | | | |
| Byte 2 | | 3rd input byte (Base IO) | | | | | | | |
| Byte 3 | | 4th input byte (Base IO) | | | | | | | |
| Byte 4 | 1 | Empty, Always 0 | | | | Discrete Input 4 points (Slot# 1) | | | |
| Byte 5 | 2 | Discrete Input low 8 pts (Slot#2) | | | | | | | |
| Byte 6 | | Discrete Input high 8 pts (Slot#2) | | | | | | | |
| Byte 7 | 3 | Analog Input Ch0 low byte (Slot#3) | | | | | | | |
| Byte 8 | | Analog Input Ch0 high byte (Slot#3) | | | | | | | |
| Byte 9 | | Analog Input Ch1 low byte (Slot#3) | | | | | | | |
| Byte 10 | | Analog Input Ch1 high byte (Slot#3) | | | | | | | |
| Byte 11 | | Analog Input Ch2 low byte (Slot#3) | | | | | | | |
| Byte 12 | | Analog Input Ch2 high byte (Slot#3) | | | | | | | |
| Byte 13 | | Analog Input Ch3 low byte (Slot#3) | | | | | | | |
| Byte 14 | | Analog Input Ch3 high byte (Slot#3) | | | | | | | |

### 3.2.9.2 Example of Output Process Image Map

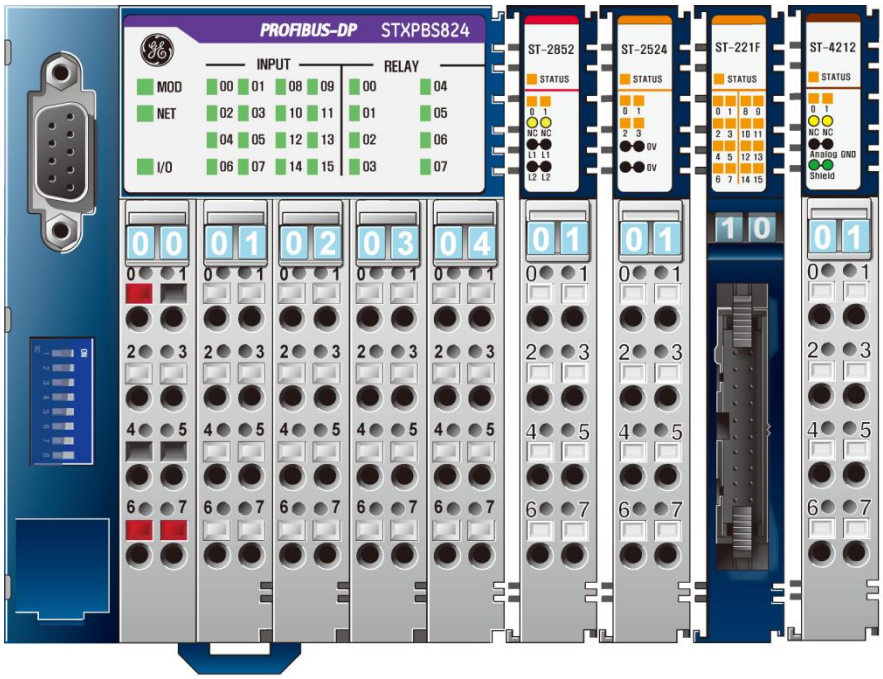



*Figure 36: Slot Configuration*

The following table lists the slot number and module description.

*Table 30: Slot number and Module Description*

| Slot Address | Module Description |
|---|---|
| #0 | STXPBS032<br>32-discrete input (4 byte) |
| #1 | 2-discrete Input (2 bit) |
| #2 | 4-discrete Input (4 bit) |
| #3 | 16-discrete output (2 byte) |
| #4 | 2-analog output (2 word) |

- Output Process Image Mode (Uncompressed Output Processing Data)

***Table 31: Output Process Image Mode***

| Byte | Slot # | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 0 | 0 (AT2) | 1st output byte (Base IO) | | | | | | | |
| Byte 1 | | 2nd output byte (Base IO) | | | | | | | |
| Byte 2 | | 3rd output byte (Base IO) | | | | | | | |
| Byte 3 | | 4th output byte (Base IO) | | | | | | | |
| Byte 4 | 1 | Empty, Don't care | | | | | | Discrete Output 2 points (Slot# 1) | |
| Byte 5 | 2 | Empty, Don't care | | | | Discrete Output 4 points (Slot#2) | | | |
| Byte 6 | 3 | Discrete Output low 8 pts (Slot#3) | | | | | | | |
| Byte 7 | | Discrete Output high 8 pts (Slot#3) | | | | | | | |
| Byte 8 | 4 | Analog Output Ch0 low byte (Slot#4) | | | | | | | |
| Byte 9 | | Analog Output Ch0 high byte (Slot#4) | | | | | | | |
| Byte 10 | | Analog Output Ch1 low byte (Slot#4) | | | | | | | |
| Byte 11 | | Analog Output Ch1 high byte (Slot#4) | | | | | | | |

## 3.3 STXPBS001: DPV1 Service Specification

### 3.3.1 Supported Service

- MSAC1 Read
- MSAC1 Write
- MSAC2 Initiate / MSAC2 Abort
- MSAC2 Read
- MSAC2 Write

### 3.3.2 MSAC1 Read (PROFIBUS-DP Extensions to EN 50170)

- MSAC1 Read Request

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Slot Number | Slot Number (0~32),<br>0 : STXPBS001 |
| Index | 1 : Parameter<br>2 : Memory<br>...<br>252: IO Module Vendor code (Not used by user)<br>253: Revision (Not used by user)<br>254: Vendor code (Not used by user) |
| Length | 1~128 |

- MSAC1 Read Confirm (+)

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Length | 1~128 |
| Data | User Data |

- MSAC1 Read Confirm (-)

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Error Decode | - |
| Error code 1 | - |
| Error code 2 | Reserved |

### 3.3.3 MSAC1 Write (PROFIBUS-DP Extensions to EN 50170)

■ MSAC1 Write Request

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Slot Number | Slot Number (0~32),<br>0: STXPBS001 |
| Index | 1: Parameter<br>2: Memory |
| Length | 1~128 |
| Data | 1. Parameter<br>2. Memory<br>■ Data[0]: Offset Low<br>■ Data[1]: Offset High<br>■ Data[2]…: User Data<br>3. Revision(Not used by user)<br>■ Data[0]: 0xAE<br>■ Data[1]: 0xBE<br>■ Data[2]: 0xCE<br>■ Data[3]: 0xDE<br>■ Data[4]:<br>4. Vendor(Not used by user)<br>■ Data[0]: 0xAE<br>■ Data[1]: 0xBE<br>■ Data[2]: 0xCE<br>■ Data[3]: 0xDE<br>■ Data[4]: |

■ MSAC1 Write Confirm (+)

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Length | 1~128 |

■ MSAC1 Write Confirm (-)

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Error Decode | - |
| Error code 1 | - |
| Error code 2 | Reserved |

### 3.3.4 MSAC2 Initiate (PROFIBUS-DP Extensions to EN 50170)

- MSAC2 Initiate Request

| Parameter | Description |
|---|---|
| C_Ref | PROFIBUS-DP Extensions to EN50170 |
| Rem_Add | Slave station address(0~99) |
| Send Timeout | PROFIBUS-DP Extensions to EN50170 |
| Features_Supported_1 | 0x03 |
| Features_Supported_2 | Reserved |
| Profile_Features_Supported_1 | PROFIBUS-DP Extensions to EN50170 |
| Profile_Features_Supported_2 | PROFIBUS-DP Extensions to EN50170 |
| Profile_Ident_Number | PROFIBUS-DP Extensions to EN50170 |
| Add_Addr_Param | PROFIBUS-DP Extensions to EN50170<br>(S-Addr = 0, D-Addr = 0) |

- MSAC2 Initiate Confirm (+)

| Parameter | Description |
|---|---|
| C_Ref | PROFIBUS-DP Extensions to EN50170 |
| Features_Supported_1 | PROFIBUS-DP Extensions to EN50170 |
| Features_Supported_2 | PROFIBUS-DP Extensions to EN50170 |
| Profile_Features_Supported_1 | 0 |
| Profile_Features_Supported_2 | 0 |
| Profile_Ident_Number | 0 |
| Add_Addr_Param | PROFIBUS-DP Extensions to EN50170<br>(S-Addr = 0, D-Addr = 0) |

- MSAC2 Initiate Confirm (-)

| Parameter | Description |
|---|---|
| Remote Address | Communication Reference |
| Error Decode | - |
| Error code 1 | - |
| Error code 2 | Reserved |

### 3.3.5 MSAC2 Abort (PROFIBUS-DP Extensions to EN 50170)

- MSAC2 Initiate Request

| Parameter | Description |
|---|---|
| C_Ref | PROFIBUS-DP Extensions to EN50170 |
| Subnet | Slave station address |
| Instance | PROFIBUS-DP Extensions to EN50170 |
| Reason_code | PROFIBUS-DP Extensions to EN50170<br>MSAC2_Read,MSAC2_Write |

### 3.3.6 MSAC2 Read (PROFIBUS-DP Extensions to EN 50170)

- MSAC2 Read Request

| Parameter | Description |
|---|---|
| C_Ref | Communication-Reference |
| Slot Number | Slot Number (0~32),<br>0: STXPBS001<br>1~32 : IO |
| Index | 1: Parameter<br>2: Memory<br>252: IO Module Vendor code (Not used by user)<br>253: Revision (Not used by user)<br>254: Vendor code (Not used by user) |
| Length | 1~128 |

- MSAC2 Read Confirm (+)

| Parameter | Description |
|---|---|
| C_Ref | Communication-Reference |
| Length | 1~128 |
| Data | - |

- MSAC2 Read Confirm (-)

| Parameter | Description |
|---|---|
| Remote Address | Communication-Reference |
| Error Decode | - |
| Error code 1 | - |
| Error code 2 | Reserved |

### 3.3.7 MSAC2 Write (PROFIBUS-DP Extensions to EN 50170)

■ MSAC2 Write Request

| Parameter | Description |
|---|---|
| Remote Address | Slave Address (0~99) |
| Slot Number | Slot Number (0~32),<br>0: STXPBS001 |
| Index | 1: Parameter<br>2: Memory |
| Length | 1~128 |
| Data | 1. Parameter<br>2. Memory<br>■ Data[0]: Offset Low<br>■ Data[1]: Offset High<br>■ Data[2]…: User Data<br>3. Revision<br>■ Data[0]: 0xAE<br>■ Data[1]: 0xBE<br>■ Data[2]: 0xCE<br>■ Data[3]: 0xDE<br>■ Data[4]:<br>4. Vendor<br>■ Data[0]: 0xAE<br>■ Data[1]: 0xBE<br>■ Data[2]: 0xCE<br>■ Data[3]: 0xDE<br>■ Data[4]: |

■ MSAC2 Write Confirm (+)

| Parameter | Description |
|---|---|
| Remote Address | Communication-Reference |
| Length | 1~128 |

■ MSAC2 Write Confirm (-)

| Parameter | Description |
|---|---|
| Remote Address | Communication-Reference |
| Error Decode | - |
| Error code 1 | - |
| Error code 2 | Reserved |

### 3.3.8 Error Decode (PROFIBUS-DP Extensions to EN 50170)

- 0~127 : Reserved
- 128 : DPV1
- 129~253 : Reserved
- 254 : FMS
- 255 : HART

### 3.3.9 Error Code_1 (PROFIBUS-DP Extensions to EN 50170)

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|
| | ■ Error Class<br>– 0xA : Application class | | | | ■ Error code<br>– 0: Read Error<br>– 1: Write Error<br>– 2: Module Failure<br>– 3 ~7: Reserved<br>– 8: Version conflict<br>– 9: Feature not supported<br>– 10~15: User specific | | | |
| | ■ Error Class<br>– 0xB : Access class | | | | ■ Error code<br>– 0: Invalid index<br>– 1: Write length error<br>– 2: Invalid slot<br>– 3: Type conflict<br>– 4: Invalid area<br>– 5: state conflict<br>– 6: access denied<br>– 7: invalid range<br>– 8: invalid parameter<br>– 9: invalid type<br>– 10~15: User specific | | | |
| | ■ Error Class<br>– 0xC : Resource class | | | | ■ Error code<br>– 0: read constrain conflict<br>– 1: Write constrain conflict<br>– 2: Resource busy<br>– 3 Resource unavailable<br>– 4 ~7: Reserved<br>– 8~15: User specific | | | |
| | ■ Error Class<br>– 0xD : STXPBS001 Specific Class | | | | ■ Error code<br>– 1: Slot Parameter write error<br>– 2: Read memory error<br>– 3: Write memory error | | | |

### 3.3.10 Diagnostics

| Byte | Item | Description |
|---|---|---|
| 0 | Station status 0 | PROFIBUS Standard Diagnostic |
| 1 | Station status 0 | |
| 2 | Station status 0 | |
| 3 | Master Address | |
| 4 | PNO Ident Number High | |
| 5 | PNO Ident Number Low | |
| 6 | ID Diagnostic Header | Extended Diagnostic (ID Related Diagnostic) |
| 7 | Diagnostic allocation (Slot0~7) | |
| 8 | Diagnostic allocation (Slot8~15) | |
| 9 | Diagnostic allocation (Slot16~23) | |
| 10 | Diagnostic allocation (Slot24~31) | |
| 11 | Diagnostic allocation (Slot32~39) | |
| 12 | Reserved | |
| 13 | | |
| 14 | | |
| 15 | Device Status Diagnostic Header | Extended Diagnostic (Device Status) |
| 16 | Status Type (0xA0:Manufacture-specific) | |
| 17 | Slot Number | |
| 18 | Status differentiation (0:No differentiation) | |
| 19 | Status message | |
| 20 | Reserved | |

- ID Related Diagnostic

| Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|
| 6 | ID Diagnostic Header (0x45) | | | | | | | |
| 7 | Slot 7 | Slot 6 | Slot 5 | Slot 4 | Slot 3 | Slot 2 | Slot 1 | STXPB S001 |
| 8 | Slot 15 | Slot 14 | Slot 13 | Slot 12 | Slot 11 | Slot 10 | Slot 9 | Slot 8 |
| 9 | Slot 23 | Slot 22 | Slot 21 | Slot 20 | Slot 19 | Slot 18 | Slot 17 | Slot 16 |
| 10 | Slot 31 | Slot 30 | Slot 29 | Slot 28 | Slot 27 | Slot 26 | Slot 25 | Slot 24 |
| 11 | Reserved | | | | | | | Slot 32 |

- Device Related Diagnostic (Status message byte)
  - 0x21: No response from expansion slot
  - 0x22: Response error (Type)
  - 0x23: Response error (Slot Number)
  - 0x24: Response error (Length)
  - 0x25: Response error (Protocol)
  - 0x26: Response error (ID)
  - 0x27: Response error (Function code)
  - 0x28: Response error (CRC)
  - 0x29: Response error (Data)
  - 0x2A: Response error (Sequence)
  - 0x2B: STXPBS001 Request error
  - 0x2C: STXPBS001 Broadcasting error
  - 0x41: RSTi bus Rx Timeout
  - 0x42: Faulty input data (Type)
  - 0x43: Faulty input data (Slot number)
  - 0x44: Faulty input data (Length)
  - 0x45: Faulty input data (CRC)
  - 0x46: Faulty input data (Slot diag.)
  - 0x47: Input update timeout
  - 0x48: RSTi bus token fault
  - 0xC1: Resource error of slot
  - 0xC2: Not supported service from slot
  - 0xC3: Attribute error from slot
  - 0xC4: Slot is already in this mode
  - 0xC5: Object conflict from slot
  - 0xC6: Attribute not settable
  - 0xC7: Insufficient data
  - 0xC8: Not supported attribute
  - 0xC9: Too much data
  - 0xCA: Object not exist
  - 0xCB: Invalid slot parameter
  - 0xCC: Store fail
  - 0xCD: Access denied
  - 0xCE: RSTi bus token error
  - 0xCF: Object not exist
  - 0xD0: Slot memory size over
  - 0xE1: No expansion slot
  - 0xE2: Too many slots
  - 0xE3: Input data size overflow
  - 0xE4: Output data size overflow
  - 0xE5: Invalid product code
  - 0xE6: Set output-offset error
  - 0xE7: Set slot active-flag error
  - 0xE8: Set slot parameter error
  - 0xE9: Set RSTi bus parameter error
  - 0xEA: Slot warm-start error
  - 0xEB: Get slot catalog number error
  - 0xEC: Invalid slot request
  - 0xED: Firmware fault
  - 0xEE: Set word-type error
  - 0xF0: Vendor code fault
  - 0xFF: Not ready

# 4. PROFINET Network Adapter

## 4.1 STXPNS001

### 4.1.1 Interface

The following figure shows the interface design for STXPNS001.

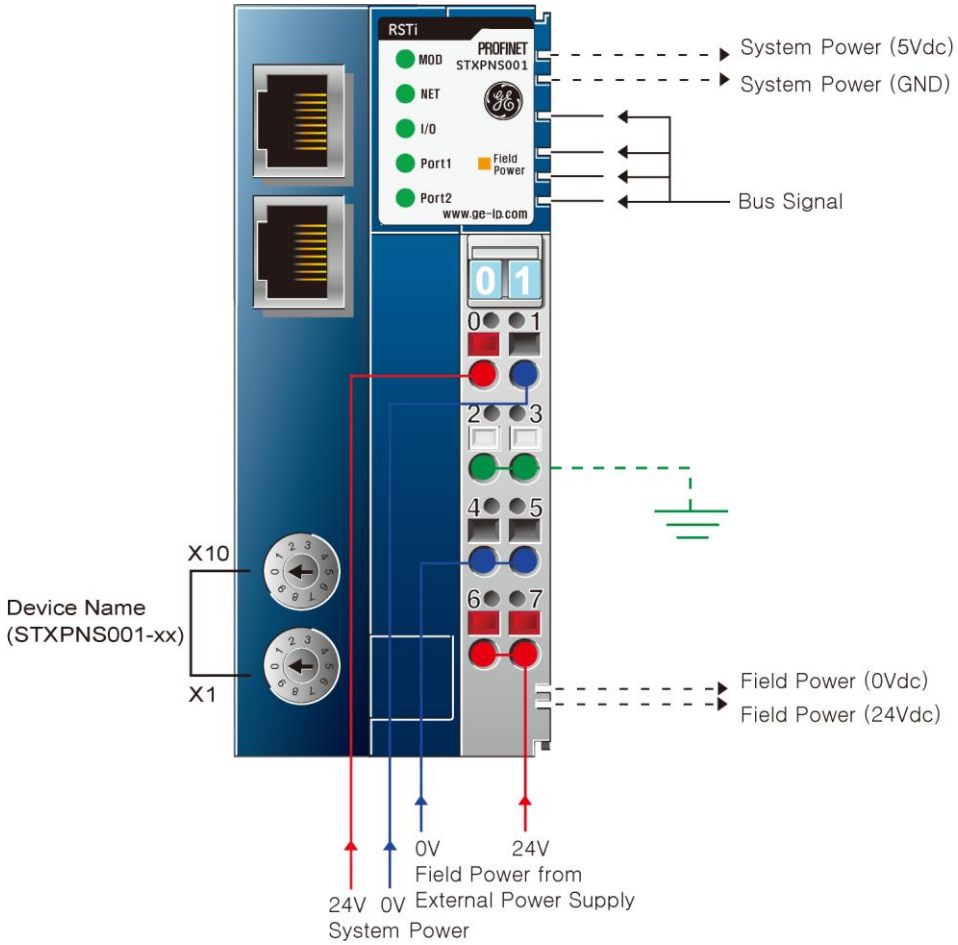



***Figure 37: PROFINET Network Adaptor Module: STXPNS001***

The following table lists the pin numbers and their description for STXPNS001.

***Table 32: STXPNS001: Pin Description***

| Pin Number | Description | Pin Number | Description |
|---|---|---|---|
| 0 | System power 24v | 1 | System power 0 v |
| 2 | Ground | 3 | Ground |
| 4 | Field power 0v | 5 | Field power 0v |
| 6 | Field power 24v | 7 | Field power 24v |

### 4.1.2 STXPNS001 Specifications

The following table describes the Interface Specifications and General Specifications of STXPNS001.

***Table 33: STXPNS001: General and Environment Specifications***

| ***Items*** | ***Specification*** |
|---|---|
| ***Communication Interface Specifications*** | |
| Protocol | PROFINET IO RT |
| Station type | PROFINET IO Device |
| Topology | Line or Star topology |
| Number of Nodes | Limited by the IP address |
| Number of Expansion I/O slots | Maximum 32 slots |
| I/O Data Size | 252 Bytes inputs/252 Bytes outputs |
| Indicators | 1 green/red MOD Status Indicator<br>1 green/red NET Status Indicator<br>1 green/red IO Status Indicator<br>1 green Port1 Link/Active Status Indicator<br>1 green Port2 Link/Active Status Indicator<br>1 green Field Power Status indicator |
| Communication Rate | 10*/100Mbps *10Mbps for FTP only |
| Module Location | First module of RSTi system |
| ***General Specification*** | |
| System Power | Supply voltage : 24Vdc nominal<br>Supply voltage range : 11~28.8Vdc<br>Protection : Output current limit (Minimum 1.5A)<br>Reverse polarity protection |
| Power Dissipation | 115mA typical @24Vdc |
| Current for I/O Module | 1.5A @5Vdc |
| Isolation | System power to internal logic: Non-isolation<br>System power to I/O driver: Isolation |
| Field Power | Supply voltage: 24Vdc nominal<br>Supply voltage range : 11~28.8Vdc |
| Current in Jumper Contacts | DC 10A Maximum |
| Weight | 150g |
| Module Size | 45mm x 99mm x 70mm |
| Environment Condition | See “Environmental Specifications" in Appendix A. |

### 4.1.3 STXPNS001 LED Indicators

#### 4.1.3.1 Module Status LED (MOD)

***Table 34: STXPNS001: Module Status LED***

| *Color* | *Status* | *Function* |
|---|---|---|
| Off | Power off<br>H/W Fault | No power is supplied to the unit. |
| Solid Green | Invalid boot image header (Flash), ROM Boot loader | The unit has occurred unrecoverable fault in self-testing.<br>– Firmware fault |
| Flashing Red (0.5S) | | Invalid RAM Image |
| Flashing Red (0.1S) | | OS Fatal error is occurred |
| Flashing Green (0.1S) | | OS Handle Unexpected Exceptions |
| Solid Green | Normal Operation | The unit is operating in normal condition. |

#### 4.1.3.2 Network Status LED (NET)

***Table 35: STXPNS001: Network Status LED***

| *Color* | *Status* | *Function* |
|---|---|---|
| Off | Power off<br>No Connection has been established with IO-controller. | Device is not on-line or may not be powered. |
| Flashing Red (0.1s) | Invalid Configuration | Invalid Configuration |
| Flashing Green (0.1s) | Wait parameters | PROFINET IO connection has been established. |
| Solid Red | | PROFINET IO connection is aborted after a data exchange has taken place. |
| Flashing Red (0.5s) | | PROFINET IO connection is aborted before a data exchange has taken place. |
| Flashing Green (0.5s) | | PROFINET IO Data Exchange stop |
| Solid Green | | PROFINET IO Data Exchange Run |

#### 4.1.3.3 IO Module Status LED (I/O)

**Table 36: STXPNS001: IO Status LED**

| Color | Status | Function |
|---|---|---|
| Off | Not Powered<br>No IO Module | Device has no IO module or may not be powered |
| Flashing Green | RSTi Bus On-line | RSTi Bus is on-line but does not exchanging I/O data<br>– |
| Solid Green | RSTi Bus Connection | IO module is connected and run exchanging I/O data |
| Solid Red | RSTi Bus connection fault | One or more IO module occurred in fault state.<br>– Changed IO module configuration.<br>– RSTi Bus communication failure.<br>– Word data type error<br>– Parameter setting error |
| Flashing Red | IO Configuration Failed | Failed to initialize IO module<br>– Detected invalid IO module ID.<br>– Overflowed Input / Output Size<br>– Too many IO module<br>– Initial protocol failure<br>– Mismatch vendor code between adapter and IO module. |

#### 4.1.3.4 Field Power Status LED

**Table 37: STXPNS001: Field Power Status LED**

| Color | Status | Function |
|---|---|---|
| Off | Not Supplied Field Power | Not supplied 24Vdc field power |
| Solid Green | Supplied Field Power | Supplied 24Vdc field power |

#### 4.1.3.5 Port1, Port2: Link and Activity

**Table 38: STXPNS001: Port1, Port2: Link and Activity**

| Color | Function |
|---|---|
| Solid Green | Link is up (Physical connection is established) |
| Flashing Green | Active is present |
| Off | Link is down |

### 4.1.4 STXPNS001 Dimension

The following figure displays the dimension for STXPNS001.

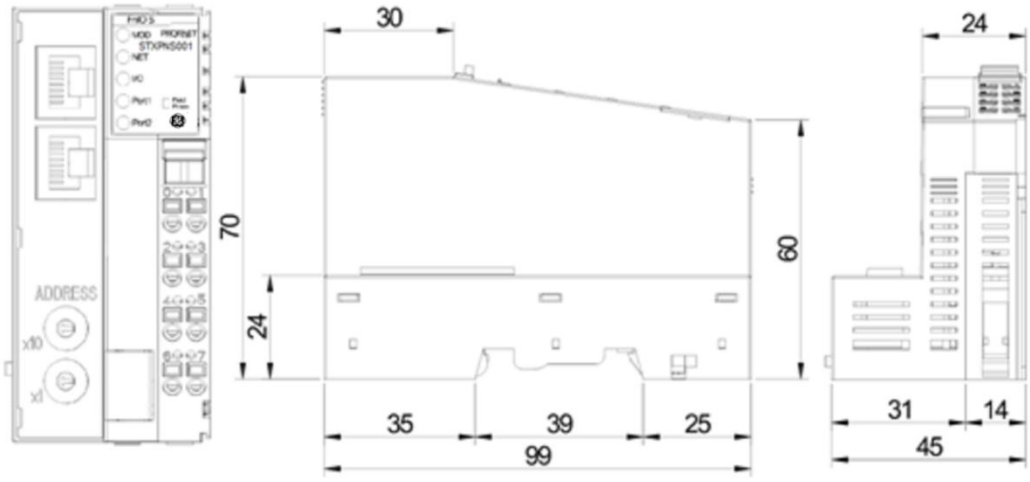



***Figure 38: Dimension for STXPNS001***

#### 4.1.4.1 Total IO

The number of the module assembly that can be connected is 32. The maximum length is 426mm. (These maximum length figures are considering all single wide modules. These values need to be adjusted if double wide modules like ST-2748 are considered)

### 4.1.5 PROFINET Communication Interface

#### 4.1.5.1 PROFINET Communication Interface for STXPNS001

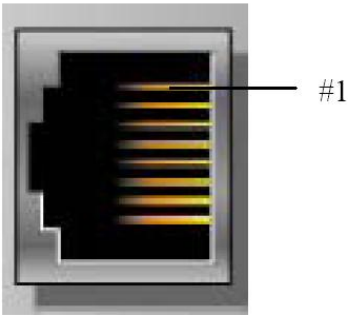



***Figure 39: Shielded RJ-45 Socket***

The following table describes the Signal Name and Description.

***Table 39: Signal name and Description***

| *RJ-45* | *Signal Name* | *Description* |
|---|---|---|
| 10. | TD+ | Transmit + |
| 11. | TD- | Transmit - |
| 12. | RD+ | Receive + |
| 13. | - | |
| 14. | - | |
| 15. | RD- | Receive - |
| 16. | - | |
| 17. | - | |
| Case | Shield | |

**Warning**

**The use of an incorrect supply voltage or frequency can cause severe damage to the component.**

### 4.1.6 PROFINET Module Configuration

#### 4.1.6.1 System and Field Power cable wiring

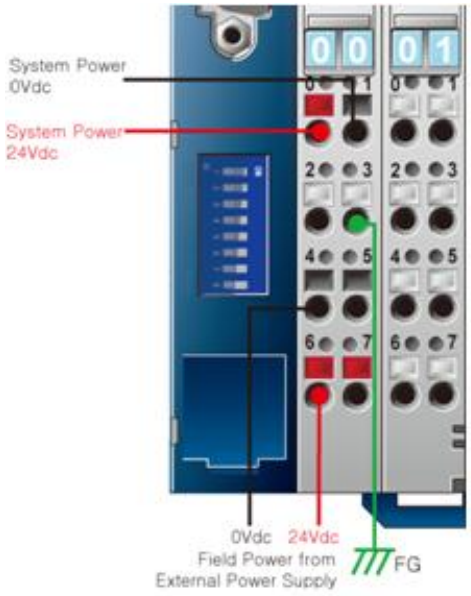



***Figure 40: System power & Field power connections***

1. For safety, supply system power and field power should be separated.
    a. System Power: for System & PROFINET communications
    b. Field Power: for I/O field device connections
2. Make sure power supplies for system power and field power are supplied separately.
3. Do not insert any other devices or components (such as transistor) into PROFINET field bus or besides PROFINET qualified products.

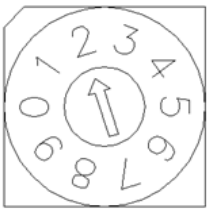
### 4.1.6.2 PROFINET Parameterization by Rotary Switch

***Table 40: Rotary switch: Values and Description***

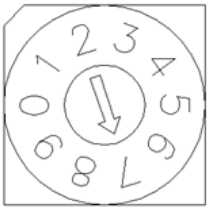
| *Value* | *Description* | *Factory Setting* |
|---|---|---|
| 0 | – Name of the station will be read from flash memory. (For example,STXPNS001-1)<br>– IP address will be read from flash memory. | Name of station : STXPNS001<br>– IP address:192.168.0.254<br>– Subnet mask: 255.255.255.0<br>– Gateway: 192.168.0.1 |
| 1~99 | – Name of the station will be STXPNS001-xx. (xx is the value of Rotary Switch)<br>– IP address will be read from flash memory. | |

■ **When the rotary switch is not set to non-zero (1~99):**

If the decimal value of the rotary switch is not zero (0), the name of device will be fixed as “STXPNS001-xx” (xx: 1~99). You must put the fixed device name.




X 10 (MSD)




X 1 (LSD)

■ **When the rotary switch is not set to zero (0):**

If the decimal value of the rotary switch is set to zero (0), the device name will be read from non-volatile memory. You should put the same name as the name from non-volatile memory. If you want to read the name in non-volatile memory, please refer to Editing Ethernet nodes.

STXPNS001 Devices on a PROFINET subnet must have unique names. The device names must satisfy the following DNS naming conventions:

- Names are limited to a total of 127 characters (letters, numbers, dashes or dots).
- Any component part (that is, a character string between two dots) of the device name may only be up to 63 characters long.
- Names cannot contain any special characters such as umlauts, parentheses, underscores, forward or backward slashes, empty spaces, and so on. The dash is the only special character allowed.
- Names must not begin or end with the "-" or "." characters.
- Names must not have the format n.n.n.n (where n = 0...999).
- The device name must not start with numbers.
- Names must not begin with the character sequence "port-xyz-" (where x, y, z = 0...9).
- If you want to change the IP address in non-volatile memory, please refer to Configuration section for more details.

Device names are assigned to PROFINET IO device when the device is being set up and placed in operation for the first time ("commissioned").

The default name is “STXPNS001-SW”.
If several devices of the same type are arranged on the same PROFINET IO system, then PME/ Programing software automatically adds sequential number to the name from the GSD file. In this case, the second device has the extension "-1", the third one has the extension "-2", and so on.

- Communication Speed Setting
  - Refer to GEIP PROFINET master module settings to change the communication speed (GE-IP PROFINET Controller User Manual- GFK-2571).

#### 4.1.6.3 STXPNS001 Parameter Settings

The following table describes the STXPNS001 parameter settings.

***Table 41: STXPNS001: Parameter Setting and Description***

| Parameter | Setting | Description |
|---|---|---|
| Word data type | MOTOLORA * | Big Endian format(MSB-LSB) |
| | INTEL | Little Endian format(LSB-MSB) |
| Stop action | Clear output image to 0 * | All outputs are set to 0. |
| | Hold last valid output image | All Outputs hold the last valid output values. |
| | Depends on IO's fault action parameters | The communication between STXPNS001 and modules will be stopped and each module will control its IO Data according to the Fault Action selected for it. |
| Reaction on RSTi Bus error | Clear input image | The input values are cleared |
| | Hold last image | The input values hold the last valid values. |
| | Auto reset * | STXPNS001 performs reset. |
| | Disconnect PROFINET | Stop the communication with Controller. |
| * Default settings | | |

#### 4.1.6.4 I/O Process Image Map

An IO module may have three types of data as I/O data, configuration parameter, and memory register. The data exchange between network adapter and IO modules is done by means of an I/O process image data by RSTi bus protocol.

The following figure shows the data flow between network adapter and IO modules.

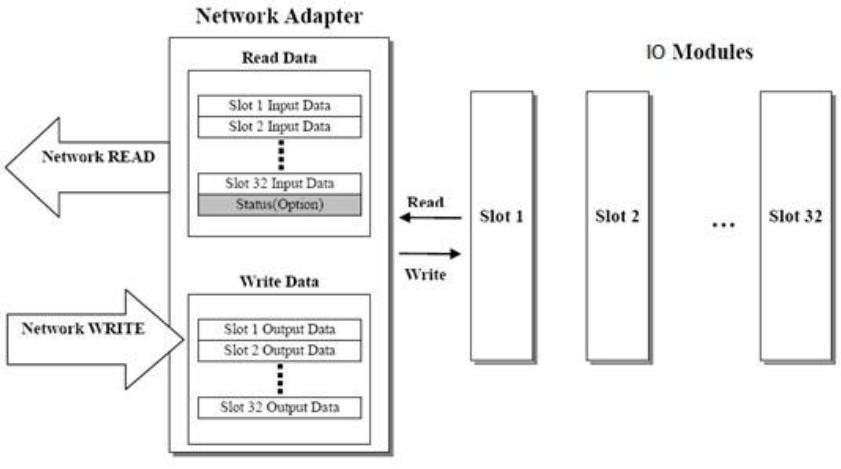



***Figure 41: Data Flow between Network Adapter and IO Modules***

### 4.1.7 Configuring an I/O Station for PROFINET Communication

To configure I/O station, add a GE-IP PROFINET master module at the desired slot in the RX3i PME project. Ensure that you have the latest GSDML file imported. Right click on master module and choose “Add IO Device”. Select “STXPNS” for PROFINET Network adapter and Select “OK”. For latest GSDML file, please visit GE-IP support site.

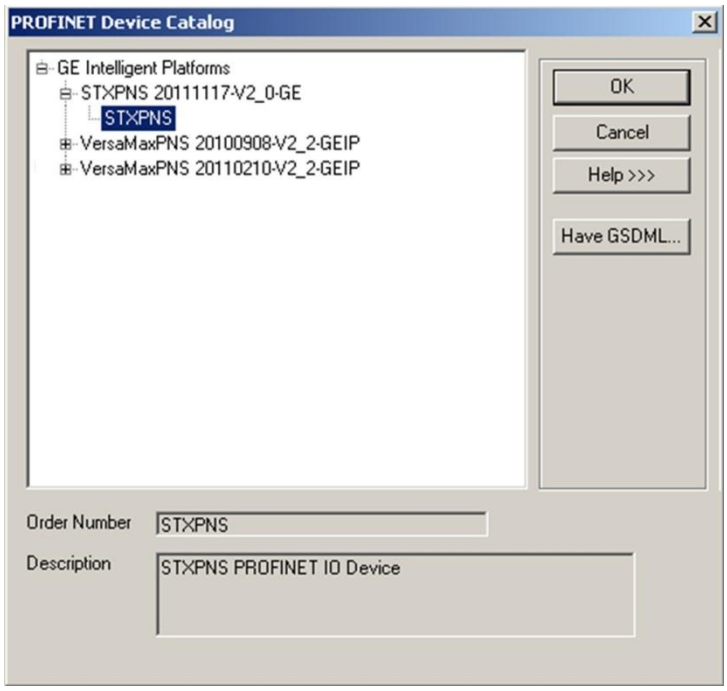



***Figure 42: PROFINET Device Catalog***

In order to add IO modules in this node, right click on recently added network adapter node and select “Change Module List”; a pop up window will open as shown below:

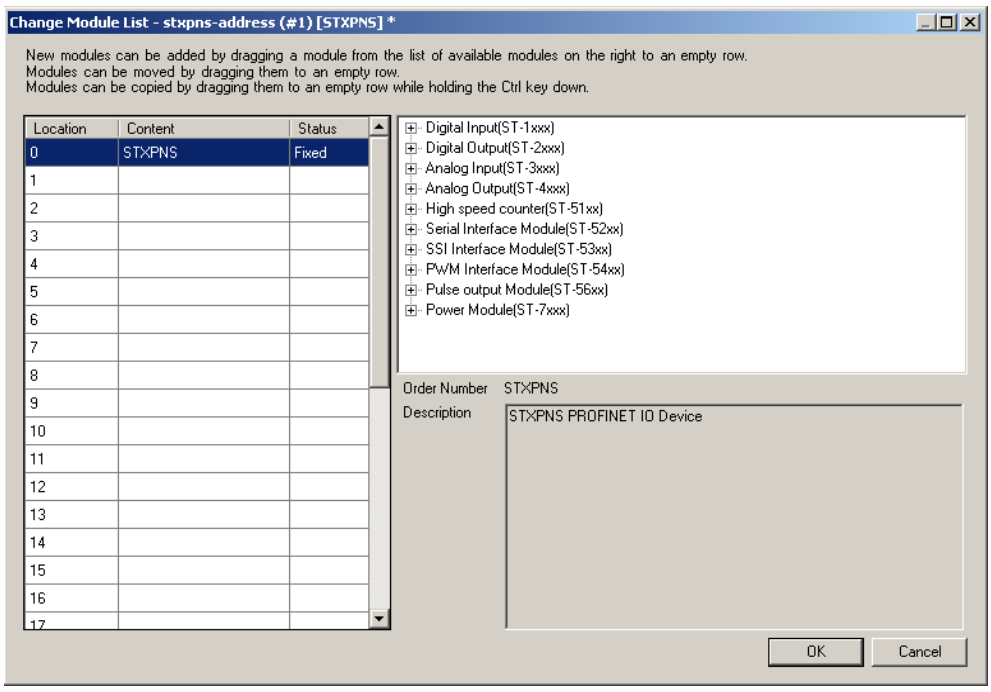



***Figure 43: Change Module List***

Now start adding the IO modules as per the physical setup; after you add all the desired IO modules, select “OK”.

To configure PROFINET network adapter configuration, right click on the PROFINET adapter node and select “Configure”, a window will open as shown below:

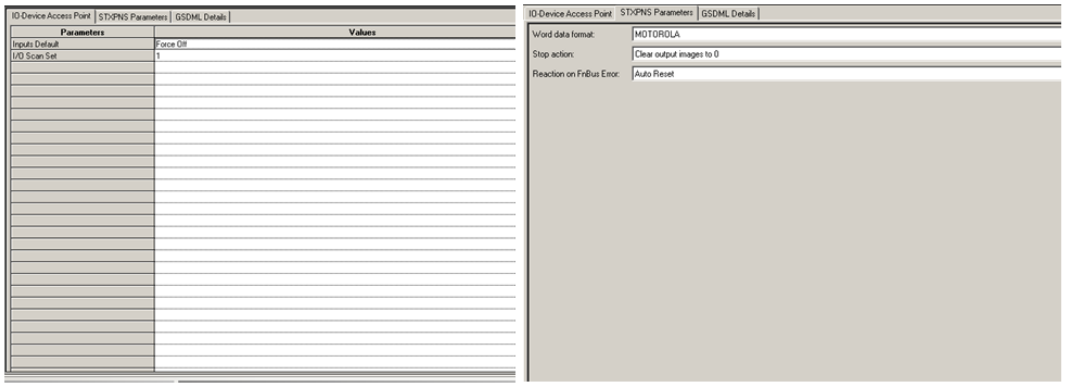



***Figure 44: Configuring PROFINET Adapter***

There are three tabs in this window IO Device Access point, STXPNS Parameters, and GSDML details.

Choose “STXPNS Parameters” for parameter settings. There are three options:

1. **Word Data Format**: The options are MOTOROLA & INTEL. MOTOROLA format is big endian; therefore ensure that the IO modules connected to the node are configured with "False" for the swap bytes input for proper operation. INTEL format is little endian, therefore ensure that in the IO modules connected to the node are configured with "True" for the swap bytes input for proper operation.
2. **Stop Action**: If a network fault is detected within the specified watchdog time base, the outputs of a slot under test of I/O station will acquire output values as per the options specified in DP clear action. The options are:
    a. *Clear Output images to 0*: The communication between STXPNS001 and slots will run. All outputs of Slot will be cleared. The output value should be set to '0' but Bus will run (IO status LED would be green)
    b. *Hold Last Valid Output image*: The communication between STXPNS001 and slots will run. All outputs of Slot will hold last value but Bus run (IO status LED would be green)
    c. *Depends on IO Fault Action Parameters*: The communication between STXPNS001 and slots will be stopped. Slots will control IO Data by itself. The output value should be ON/OFF by Fault action which it is depended on IO fault action. Bus should be ready status (IO status LED would be blinked). In order to configure the I/O module for fault action, go to “Modules” tab and select properties. For example, I have used ST-4522. Upon network fault, a user can configure the Module action as shown below. Note that substitute value low or high denotes low or high byte values.

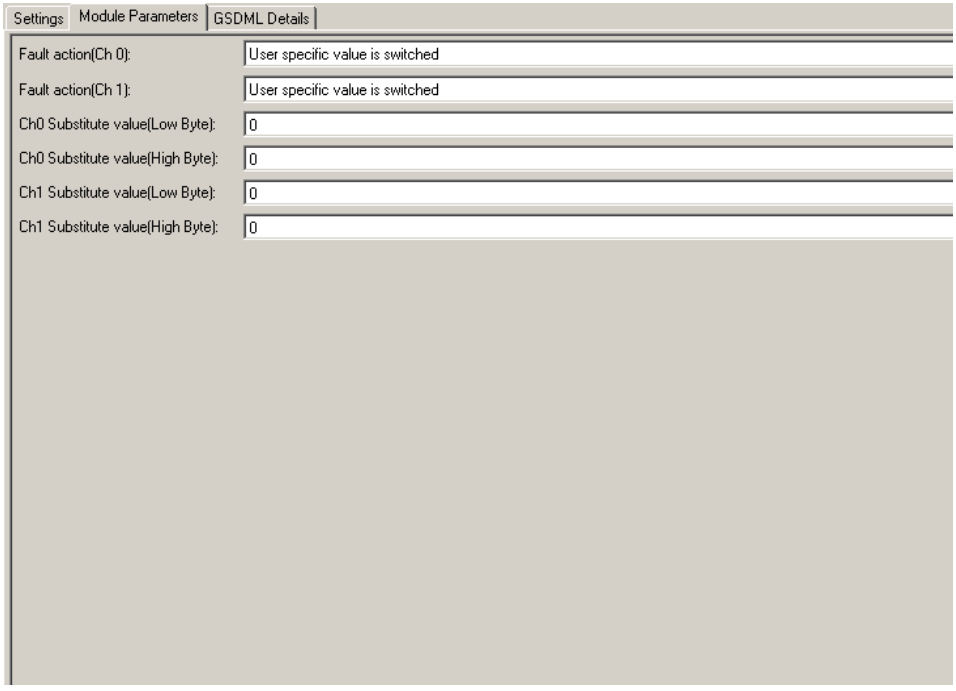



***Figure 45: Module Parameters tab***

3. **Reaction to Bus Error**: If Bus error is detected, the behavior of the network module will be as per the options selected below:
    a. *Clear Input Image*: Input values will be zero. NET LED will be Green. Network adaptor communication with master intact. IO LED will be red and fault “Loss/addition of device' logged in I/O fault table. Ensure that –Force OFF- is set for the Inputs Default at “IO device Access point tab for successful operation.
    b. *Hold Last Image*: Input values will be holding. NET LED will be Green. Network adaptor communication with master intact. IO LED will be red and fault “Loss/addition of device' logged in I/O fault table. Ensure that –Hold last State- is set for the Inputs Default at “IO device Access point tab for successful operation.
    c. *Auto Reset*: This option will reset the PROFINET Adapter module.
    d. *Disconnect PROFINET*: Last input values will not hold. NET LED will be blinking Green. Network adaptor communication with master stops .IO LED will be red and fault “Loss/addition of device' logged in I/O fault table.

**Note:** Refer to the examples section in the power modules chapter in New Slice IO manual for more details about the IO node configuration using the different power modules.

# A. Diagnostics

## A.1 How to Diagnose when Device Cannot Communicate with the Network

- Verify that cable connections are correct.
- If terminator resistor is not installed, install terminator resistor. Check location of terminator resistor.
- Ensure there are no duplicate node addresses.
- Check configuration of master for port settings, time out, data size etc.
- Power cycle the network adapter to ensure applicability of correct baud rate, parity, byte formats, IO configuration parameters, Input and Output process image modes.
- Check system power & field power connections. Ensure separate power sources are used for system power and Field power. Ensure Network adapter or system power modules are not over loaded.
- Ensure ground cable connections.
- Ensure environment factors are within the limit.

# B. Product List

**Table 42: Product List**

| ST-Number | Description | ID(hex) | Production Status |
|---|---|---|---|
| **Digital Input Modules** | | | |
| ST-1114 | 4 Points, Sink(Positive), 5Vdc | 41 00 01 | Active |
| ST-1124 | 4 Points, Source(Negative), 5Vdc | 41 00 02 | Active |
| ST-1214 | 4 Points, Sink(Positive), 12V/24Vdc | 41 00 03 | Active |
| ST-1218 | 8 Points, Sink(Positive), 12V/24Vdc | 41 00 07 | Active |
| ST-121F | 16 Points, Sink(Positive), 12V/24Vdc | 41 01 13 | Active |
| ST-1224 | 4 Points, Source(Negative), 12V/24Vdc | 41 00 04 | Active |
| ST-1228 | 8 Points, Source(Negative), 12V/24Vdc | 41 00 08 | Active |
| ST-122F | 16 Points, Source(Negative), 12V/24Vdc | 41 01 14 | Active |
| ST-1314 | 4 Points, Sink(Positive), 48Vdc | 41 00 05 | Active |
| ST-131F | 16 Points, Sink(Positive), 48Vdc | 41 01 17 | Active |
| ST-1324 | 4 Points, Source(Negative), 48Vdc | 41 00 06 | Active |
| ST-1804 | 4 Points, 120Vac, | 41 00 09 | Active |
| ST-1904 | 4 Points, 240Vac, | 41 00 0A | Active |
| **Digital Output Modules** | | | |
| ST-2114 | 4 Points TTL Inverting, 5Vdc/20mA, | 81 00 0D | Active |
| ST-2124 | 4 Points TTL Non-Inverting, 5Vdc/20mA, | 81 00 0F | Active |
| ST-221F | 16 Points Sink(Negative Logic), 24Vdc/0.5A, | 81 01 15 | Active |
| ST-222F | 16 Points Source(Positive Logic), 24Vdc/0.5A, | 81 01 16 | Active |
| ST-2314 | 4 Points Sink(Negative Logic), 24Vdc/0.5A, | 81 00 0E | Active |
| ST-2318 | 8 Points Sink(Negative Logic), 24Vdc/0.5A, | 81 00 11 | Active |
| ST-2324 | 4 Points Source(Positive Logic), 24Vdc/0.5A, | 81 00 10 | Active |
| ST-2328 | 8 Points Source(Positive Logic), 24Vdc/0.5A, | 81 00 12 | Active |
| ST-2414 | 4 Points Sink(Negative Logic), 24Vdc/0.5A, Diagnostics | 81 00 08 | Active |
| ST-2424 | 4 Points Source(Positive Logic),24Vdc/0.5A, Diagnostics | C1 00 00 38 | Active |
| ST-2514 | 4 Points Sink(Negative Logic), 24Vdc/2A, Diagnostics | C1 00 00 35 | Active |
| ST-2524 | 4 Points Source(Positive Logic), 24Vdc/2A, Diagnostics | C1 00 00 36 | Active |
| ST-2742 | 2 Points, 240Vac/2A, 24Vdc/2A, Relay | 81 00 0B | Active |
| ST-2744 | 4 Points, 240Vac/2A, 24Vdc/2A, Relay | 81 00 51 | Active |
| ST-2748 | 8 Points, 240Vac/2A, 24Vdc/2A, Relay | 81 00 50 | Active |
| | | | |
| ST-2852 | 2 Points, 12~125Vac/0.5A, Triac | 81 00 0C | Active |

| ST-Number | Description | ID(hex) | Production Status |
|---|---|---|---|
| **Analog Input Modules** | | | |
| ST-3114 | 4 Channels, Current, 0~20mA, 12bit | 41 43 1C | Active |
| ST-3118 | 8 Channels, Current, 0~20mA, 12bit | 41 47 82 | Active |
| ST-3134 | 4 Channels, Current, 0~20mA, 14bit | 41 43 1E | Active |
| ST-3214 | 4 Channels, Current, 4~20mA, 12bit | 41 43 1D | Active |
| ST-3218 | 8 Channels, Current, 4~20mA, 12bit | 41 47 83 | Active |
| ST-3234 | 4 Channels, Current, 4~20mA, 14bit | 41 43 1F | Active |
| | | | |
| ST-3424 | 4 Channels, Voltage, 0~10Vdc, 12bit | 41 43 20 | Active |
| ST-3428 | 8 Channels, Voltage, 0~10Vdc, 12bit | 41 47 22 | Active |
| ST-3444 | 4 Channels, Voltage, 0~10Vdc, 14bit | 41 43 22 | Active |
| ST-3524 | 4 Channels, Voltage, -10Vdc~10Vdc, 12bit | 41 43 21 | Active |
| ST-3544 | 4 Channels, Voltage, -10Vdc~10Vdc, 14bit | 41 43 23 | Active |
| ST-3624 | 4 Channels, Voltage, 0~5Vdc, 12bit | 41 43 24 | Active |
| ST-3644 | 4 Channels, Voltage, 0~5Vdc, 14bit | 41 43 25 | Active |
| ST-3702 | 2 Channels, RTD, Status | 41 41 28 | Active |
| ST-3704 | 4 Channels, RTD, Status | 41 43 64 | Active |
| ST-3708 | 8 Channels, RTD, Status | 41 47 65 | Active |
| ST-3802 | 2 Channels, TC | 41 41 2A | Active |
| ST-3804 | 4 Channels, TC | 41 43 66 | Active |
| ST-3808 | 8 Channels, TC | 41 47 67 | Active |
| **Analog Output Modules** | | | |
| ST-4112 | 2 Channels, Current, 0~20mA, 12bit | 81 41 2C | Active |
| ST-4114 | 4 Channels, Current, 0~20mA, 12bit | 81 43 6D | Active |
| ST-4212 | 2 Channels, Current, 4~20mA, 12bit | 81 41 2D | Active |
| ST-4214 | 4 Channels, Current, 4~20mA, 12bit | 81 43 6E | Active |
| | | | |
| ST-4422 | 2 Channels, Voltage, 0~10Vdc, 12bit | 81 41 2E | Active |
| ST-4424 | 4 Channels, Voltage, 0~10Vdc, 12bit | 81 43 6A | Active |
| | | | |
| ST-4491 | 1 Channel, Voltage, 0~10Vdc, 12bit, Manual Type | C1 40 41 BF | Active |
| ST-4522 | 2 Channels, Voltage, -10~10Vdc, 12bit | 81 41 2F | Active |
| ST-4622 | 2 Channels, Voltage, 0~5Vdc, 12bit | 81 41 30 | Active |
| ST-4911 | 1 Channel, Current, 0~1A, 12bit | 81 40 31 | Active |

| ST-Number | Description | ID(hex) | Production Status |
|---|---|---|---|
| | **Special Modules** | | |
| ST-5101 | 1 Channel, High Speed Counter, 5V Input | C1 01 05 34 | Active |
| ST-5111 | 1 Channel, High Speed Counter, 24V Input | C1 01 05 39 | Active |
| ST-5112 | 2 Channel, High Speed Counter, 24V Sink Input | C1 01 07 4D | Active |
| ST-5114 | 4 Channel, High Speed Counter, 24V Sink Input | C1 03 0F 4C | Active |
| ST-5211 | RS232 Communication, 1Channel, RTS/CTS Flow Control | C1 05 05 42 | Active |
| ST-5212 | RS232 Communication, 2Channel | C1 0B 0B 43 | Active |
| ST-5221 | RS422 Communication, 1Channel | C1 05 05 44 | Active |
| ST-5231 | RS485 Communication, 1Channel | C1 05 05 45 | Active |
| ST-5232 | RS485 Communication, 2Channel | C1 0B 0B 46 | Active |
| | | | |
| | | | |
| ST-5351 | SSI Interface 1CH | C1 01 09 9E | Active |
| ST-5422 | 2 CH PWM output, 1.5A/24Vdc, source | C1 05 01 57 | Active |
| ST-5442 | 2 CH PWM output, 0.5A/24Vdc, source | C1 05 01 56 | Active |
| ST-5444 | 4 CH PWM output, 0.5A/24Vdc, source | C1 0B 03 54 | Active |
| ST-5641 | 1 CH Pulse output, 0.5A/24Vdc, source | C1 05 03 92 | Active |
| ST-5642 | 2 CH Pulse output, 0.5A/24Vdc, source | C1 09 07 90 | Active |
| ST-5651 | 1 CH Pulse output, RS422 | C1 05 03 98 | Active |
| | **Power Modules** | | |
| ST-7408 | 8 Channels, Shield, ID Type | 02 00 E4 | Active |
| ST-7508 | 8 Channels, Common, 0Vdc, ID Type | 02 00 E5 | Active |
| ST-7511 | 1 Channel, Expansion Power, Input 24Vdc, Output 1.0A/5Vdc, ID Type | 02 00 E0 | Active |
| ST-7518 | 8 Channels, Common, 24Vdc, ID Type | 02 00 E6 | Active |
| ST-7588 | 8 Channels, Common, 0Vdc and 24Vdc, ID Type | 02 00 E7 | Active |
| ST-7641 | 1 Channel, Field Distributor, 5Vdc~48Vdc, 120Vac~240Vac, ID Type | 02 00 E2 | Active |

# C. Product Certifications and Installation Guidelines for Conformance

This appendix describes the compliance markings and standards to which the RSTi products have been certified.

## C.1 Important Notes

Solid state equipment has operational characteristics differing from those of electromechanical equipment.

Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must ensure that each intended application of this equipment is acceptable.

In no event will GE be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, GE cannot assume responsibility or liability for actual use based on the examples and diagrams.

## C.2 Safety Notes

**Warning**

The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components, for example, RSTi Bus Pin.

## C.3 Certifications

UL Hazloc:

See UL File E157515

ATEX:

Ambient range (-40°C≤$T_{amb}$≤75°C)

Certification string: EX nA IIC T4

Certification string: EX nA nC IIC T4 (Relay module)

Standards covered (EN60079-0:2012, EN60079-15:2010)

UL 508:

$_{C}UL_{US}$ Listed Industrial Control Equipment, certified for U.S. and Canada

See UL File E105285

CE Mark:

EN 61000-6-2:2005; Industrial Immunity

EN 61000-6-4:2007; Industrial Emissions

PROFINET certificate: Z10439

## C.4 Government Regulations

U.S., Canadian, Australian, and European regulations are intended to prevent equipment from interfering with approved transmissions or with the operation of other equipment through the AC power source.

The PACSystems RSTi family of products has been tested and found to meet or exceed the requirements of U.S. (47 CFR 15), Canadian (ICES-003), Australian (AS/NZS 3548), and European (EN 61000-6-4:2007) regulations for Class A digital devices when installed in accordance with the guidelines noted in this manual. These various regulations share commonality in content and test levels with that of CISPR 22 and based on this commonality testing to the each individual standard was deemed inappropriate.

The FCC requires the following note to be published according to FCC guidelines:

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case user will be required to correct the interference at his own expense.

Industry Canada requires the following note to be published:

**Note:** This Class A digital apparatus complies with Canadian ICES-003.

## C.5 Environmental Specifications

### C.5.1 PROFIBUS STXPBS001 & STXPBS*

**Table 43: Environmental specification for STXPBS001**

| Items | Specification |
|---|---|
| Operating Temperature | 0℃ to 55℃ for UL applications ; 0℃ to 60℃ for non-UL applications |
| Storage Temperature | Storage -40℃ to 85℃ |
| Relative Humidity | 5% ~ 90% Non-condensing |
| Protection Class | IP20 |
| Mounting | DIN Rail |

### C.5.2 PROFINET STXPNS001

**Table 44: Environmental specification for STXPNS001**

| Items | Specification |
|---|---|
| Operating Temperature | 0℃ to 55℃ for both UL and non UL applications. |
| Non-Operating Temperature | -40°C to 85°C |
| Relative Humidity | 5% ~ 90% Non-condensing |
| Protection Class | IP20 |
| Mounting | DIN Rail |

*** indicates STXPBS032/132/232/332/016/116/432/532/824/924/825/925.**

### C.5.3 Abbreviations

**Table 45: Abbreviations**

| Items | Description |
|---|---|
| GND | Ground |
| GSD | Generic Station Description |

## GE Intelligent Platforms Information Centers

**Headquarters:**
1-800-433-2682 or 1-434-978-5100

Global regional phone numbers are available on our web site
www.ge-ip.com


## Additional Resources

**For more information, please visit the GE Intelligent Platforms web site:**

**www.ge-ip.com**



GFK-2746B