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PLX51-PBM

PROFIBUS DPV0/DPV1 Master or Slave to EtherNet/IP[™] or Modbus[®] Gateway

May 16, 2023



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PLX51-PBM User Manual For Public Use.

May 16, 2023

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1 Preface

1.1 Introduction to the PLX51-PBM

This manual describes the installation, operation, and diagnostics of the ProSoft PLX51-PBM PROFIBUS DPV0/DPV1 Master/Slave module.

The PLX51-PBM allows the user to interface PROFIBUS DP to EtherNet/IP or Modbus (RTU232, RTU485, TCP/IP).

The PLX51-PBM can either operate as a PROFIBUS DPV0/DPV1 Master or multiple PROFIBUS DPV0/DPV1 Slaves. This will allow EtherNet/IP devices (e.g. Rockwell Logix platform) or Modbus devices to exchange process, alarming, and diagnostic data with PROFIBUS DP devices as well as provide parameterization and asset management of slave devices using Device Type Managers (DTMs).

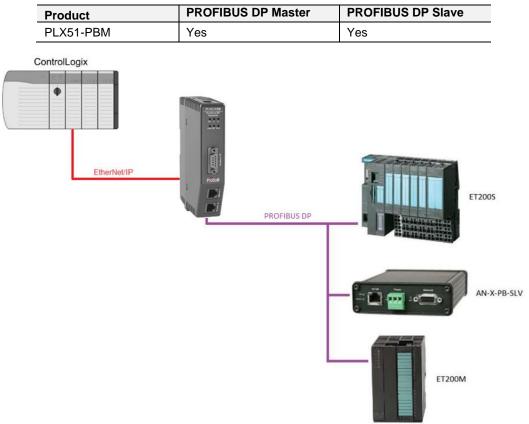


Table 1.1 – Product Variations

Figure 1.1 – PLX51-PBM typical PROFIBUS Master architecture

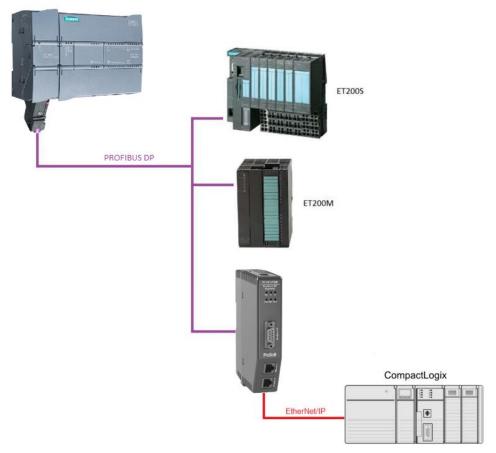


Figure 1.2 – PLX51-PBM typical PROFIBUS Slave architecture

1.2 Features

The PLX51-PBM will allow the user to interface PROFIBUS DPV0/DPV1 to either EtherNet/IP or Modbus.

The PLX51-PBM can be set to operate as either a PROFIBUS DP Master or Slave.

The PLX51-PBM, when configured as a Master can exchange up to 2 kilobytes of PROFIBUS device and status data (72 bytes are reserved for master status, and 8 bytes for each configured slave).

The PLX51-PBM has two Ethernet ports allowing the user to have either a Linear or Ring (Device Level Ring – DLR) Ethernet topology. The Ethernet ports can also be setup for port mirroring allowing for better fault analysis.

The PLX51-PBM can synchronize to an NTP Server allowing for automatic time synchronization. The PLX51-PBM also supports an onboard non-volatile event log for improved fault finding.

1.2.1 PROFIBUS Master

The PLX51-PBM can exchange process data (DPV0) with up to 125 PROFIBUS DP slave devices. The data is formatted into the engineering units for use in either a Logix platform or Modbus device by using the automatically generated mapping imports for Logix User Defined Data Types (UDTs) or padding for Modbus Registers. The latter ensures alignment with the 16-bit data structure.

The PLX51-PBM also provides DPV1 communication allowing the user to exchange DPV1 Class 1 and Class 2 data with each slave device. The PLX51-PBM Gateway DTM can be used to configure and parameterize each slave device using Device Type Manager (DTM) technology.

The PLX51-PBM will allow the user to monitor and extract DPV1 alarms from each slave device on the connected PROFIBUS DP fieldbus from either a Logix controller or Modbus Master device.

1.2.2 PROFIBUS Slave

The PLX51-PBM can also be configured to emulate up to 10 PROFIBUS slave devices. Each slave device emulated by the PLX51-PBM can be configured to provide DPV0 data exchange with a PROFIBUS Master on the network.

The data will be formatted into the engineering units for use in either a Logix platform or Modbus device by using the automatically generated mapping imports for Logix User Defined Data Types (UDTs) or padding for Modbus Registers. The latter ensures alignment with the 16-bit data structure.

Each emulated slave can also be configured to exchange DPV1 Class 1 data by mapping either Logix tags or Modbus registers for the relevant DPV1 data exchange. Each emulated slave will also be able to provide DPV1 alarming for the PROFIBUS Master.

The PLX51-PBM provides a range of statistics and tools to provide a detailed diagnostic overview of each PLX51-PBM which speeds-up fault finding. The Configuration Utility allows the user to perform a PROFIBUS DP packet capture of the running fieldbus which can be used to analyse the bus behaviour and packets received. The PLX51-PBM also provides global and device specific statistics.

1.3 Architecture

The figures below provide an example of the typical network setup for a PROFIBUS Master architecture using either an EtherNet/IP or Modbus Interface.

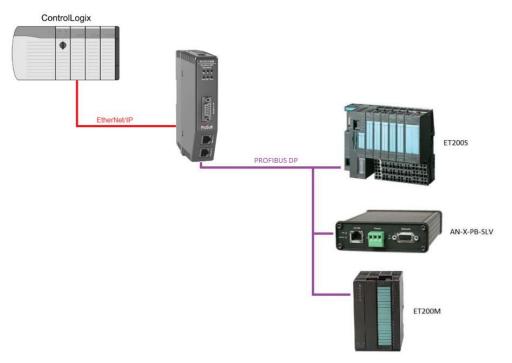


Figure 1.3 – PLX51-PBM PROFIBUS Master to EtherNet/IP architecture

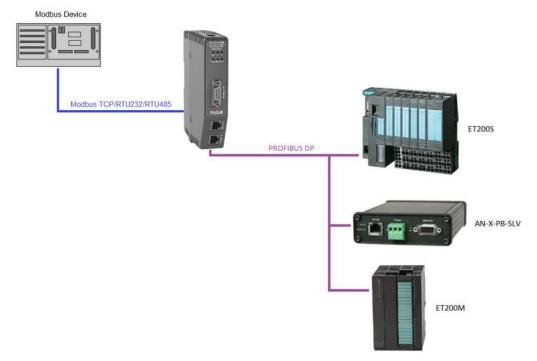


Figure 1.4 – PLX51-PBM PROFIBUS Master to Modbus (TCP/RTU232/RTU485) architecture

The following figures provide an example of the typical network setup for a PROFIBUS Slave(s) architecture using either an EtherNet/IP or Modbus Interface.

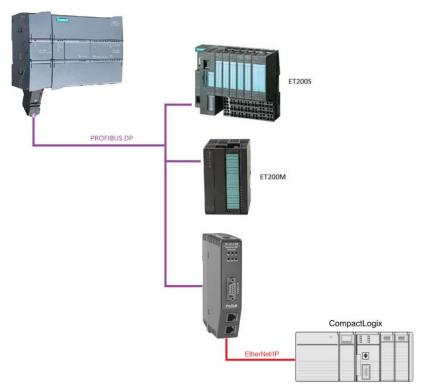


Figure 1.5 – PLX51-PBM PROFIBUS Slave to EtherNet/IP architecture

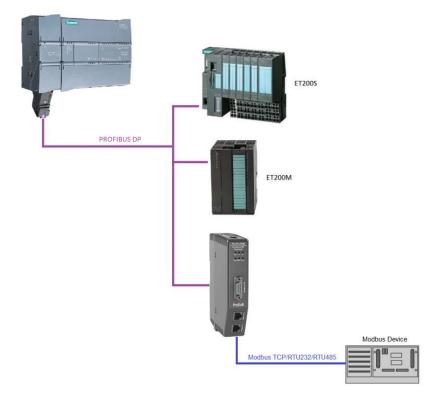


Figure 1.6 – PLX51-PBM PROFIBUS Slave to Modbus (TCP/IP/RTU232/RTU485) architecture

1.4 Additional Information

The following documents contain additional information that can assist the user with the module installation and operation.

| Resource | Link |
|---|----------------------------|
| PLX50 Configuration Utility Installation | www.prosoft-technology.com |
| PLX51-PBM User Manual PLX51-PBM Datasheet | www.prosoft-technology.com |

Table 1.2 - Additional Information

1.5 Support

Technical support is provided via the Web (in the form of user manuals, FAQ, datasheets etc.) to assist with installation, operation, and diagnostics.

For additional support the user can use either of the following:

| Resource | Link |
|---------------------|--------------------------------|
| Contact us web link | www.prosoft-technology.com |
| Support email | support@prosoft-technology.com |

2 Installation

2.1 Module Layout

The PLX51-PBM has one RS485 PROFIBUS DP port as well as two Ethernet ports at the front of the module. The Ethernet cable must be wired according to industry standards which can be found in the additional information section of this document.

The module provides six diagnostic LEDs as shown in the front view figure below. These LEDs are used to provide information regarding the module system operation, the Ethernet interface, the auxiliary communication interface (RS232/RS485), and the PROFIBUS network status.

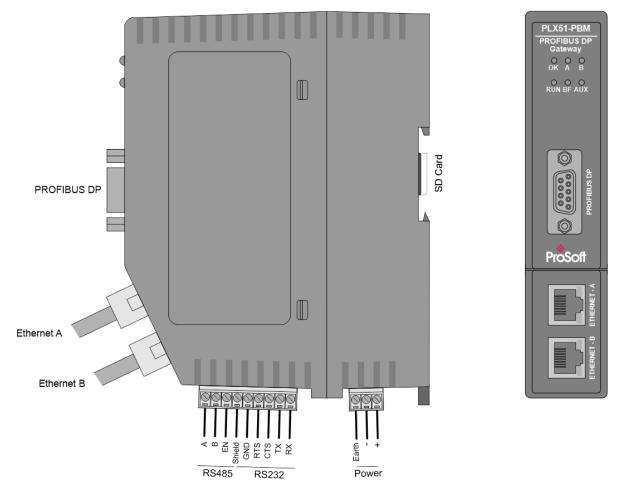


Figure 2.1 – PLX51-PBM Front and Side view

At the bottom of the PLX51-PBM module, there is one 3-way power connector and one 9-way communications connector (the communications connector will be used for RS232 and RS485 when communicating to Modbus RTU devices).

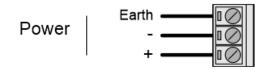


Figure 2.2 – PLX51-PBM Power connector

The PLX51-PBM has an input voltage range of 10-36Vdc that needs to be applied to the module via the power connector. The power connector also provides an Earth connection for the PLX51-PBM.

IMPORTANT: It is recommended to always have a good clean earth connected to the module via the Earth connector on the power connector.

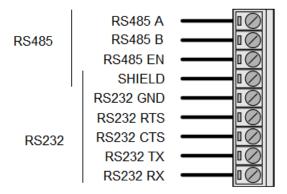


Figure 2.3 – PLX51-PBM Auxiliary communications connector

The RS485 port provides the standard A and B conductors as well as a RS485 drive enable. The (EN) transmit drive enable is provided to allow the PLX51-PBM to be used with repeaters and radios that may require a transmit enable line. Note that the EN line is referenced to RS232 GND when an RS485 mode is selected.

The RS232 port provides the standard communication conductors (RX, TX, and GND) as well as hardware handshaking lines for legacy systems (RTS – Request to Send, CTS – Clear to Send).

Both RS232 and RS485 share a common cable shield connection which should be connected to the shield of the outgoing cable (RS232 and/or RS485).

At the back of the module, there is slot for a SD memory card. The module provides four DIP switches at the top of the enclosure as shown in the top view figure below.

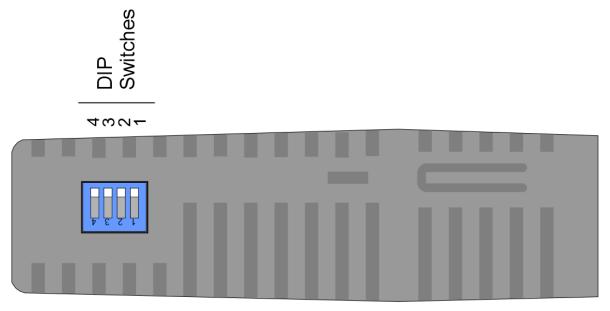


Figure 2.4 – PLX51-PBM Top view

| DIP Switch | Description |
|------------|---|
| DIP 1 | Used to force the module into "Safe Mode". When in "Safe Mode" the module will not load the application firmware and will wait for new firmware to be downloaded. This should only be used in the rare occasion when a firmware update was interrupted at a critical stage. |
| DIP 2 | This will force the module into DHCP mode which is useful when the user has forgotten the IP address of the module. |
| DIP 3 | This DIP Switch is used to lock the configuration from being overwritten by the PLX50 Configuration Utility. When set the PLX50 Configuration Utility will not be able to download to the PLX51-PBM module. |
| DIP 4 | When this DIP Switch is set at bootup it will force the module Ethernet IP address to 192.168.1.100 and network mask 255.255.255.0. The user can then switch the DIP switch off and assign the module a static IP address if needed. |

Table 2.1. - DIP Switch Settings

2.2 Module Mounting

The module provides a DIN rail clip to mount onto a 35mm DIN rail.

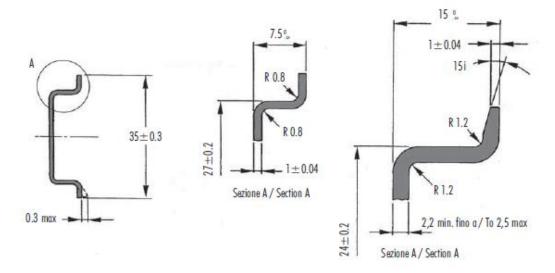


Figure 2.5 - DIN rail specification

The DIN rail clip is mounted on the bottom of the module at the back as shown in the figure below. Use a flat screw driver to pull the clip downward. This will enable the user to mount the module onto the DIN rail. Once the module is mounted onto the DIN rail the clip must be pushed upwards to lock the module onto the DIN rail.

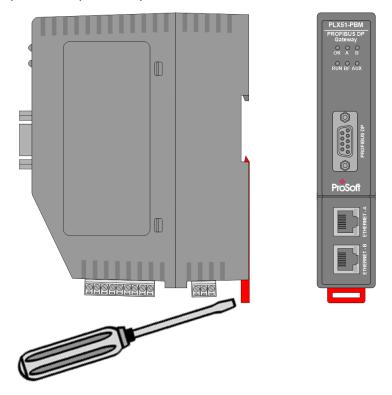


Figure 2.6 - DIN rail mouting

2.3 **PROFIBUS DP Port (RS485)**

The PROFIBUS DP port uses a female DB9 connector. This provides connection for the communication conductors, cable shielding and +5Vdc output power.

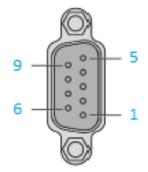


Figure 2.7 – PLX51-PBM PROFIBUS DP (RS485) DB9 connector

| Pin | Signal | Description |
|-----|-----------|--|
| 1 | - | Not connected |
| 2 | - | Not connected |
| 3 | RxD/TxD-P | Data received and transmit (+) |
| 4 | CNTR-P | Control signal to repeater (+) |
| 5 | DGND | Reference potential for +5Vdc |
| 6 | VP | +5Vdc for terminating resistors (active termination) |
| 7 | - | Not connected |
| 8 | RxD/TxD-N | Data received and transmit (-) |
| 9 | - | Not connected |

3 Setup

3.1 Install Configuration Software

All the network setup and configuration of the module is achieved by means of the ProSoft PLX50 Configuration Utility. This software can be downloaded from:

www.prosoft-technology.com.



Figure 3.1. - ProSoft PLX50 Configuration Utility Environment

3.2 Network Parameters

The module will have DHCP (Dynamic Host Configuration Protocol) enabled as factory default. Thus, a DHCP server must be used to provide the module with the required network parameters (IP address, subnet mask, etc.). There are a number of DHCP utilities available, however it is recommended that the DHCP server in the PLX50 Configuration Utility be used.

Within the PLX50 Configuration Utility environment, the DHCP server can be found under the Tools menu.

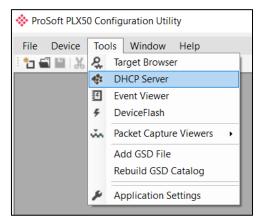


Figure 3.2. - Selecting DHCP Server

Once opened, the DHCP server will listen on all available network adapters for DHCP requests and display their corresponding MAC addresses.

| MAC Address | Vendor | Requests | Elapsed | Assigned IP | Assign | Status | Identity |
|-------------------|--------------------|----------|---------|---------------|--------|------------|-----------|
| 00:0D:8D:20:00:2B | ProSoft Technology | 4 | 69 | 192.168.1.175 | Assign | Set Static | PLX51-PBM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Figure 3.3. - DHCP Server

NOTE: If the DHCP requests are not displayed in the DHCP Server it may be due to the local PC's firewall. During installation the necessary firewall rules are automatically created for the Windows firewall. Another possibility is that another DHCP Server is operational on the network and it has assigned the IP address.

To assign an IP address, click on the corresponding "Assign" button. The IP Address Assignment window will open.

| Assign IP Address for MAC : 00:0D:8D:F | | × |
|--|--------|---|
| IP Address | Recent | |
| 192 . 168 . 1 . 172 | | |
| ✓ Enable Static (Disable DHCP) | | |
| | | |
| | | |
| Ok | Cancel | |
| 0 | | |

Figure 3.4. - Assigning IP Address

The required IP address can then be either entered, or a recently used IP address can be selected by clicking on an item in the Recent List.

If the "Enable Static" checkbox is checked, then the IP address will be set to static after the IP assignment, thereby disabling future DHCP requests.

Once the IP address window has been accepted, the DHCP server will automatically assign the IP address to the module and then read the Identity object Product name from the device.

The successful assignment of the IP address by the device is indicated by the green background of the associated row.

| 00:0D:8D:F0:D7:00 | - 56 | | | Assign | | Identity |
|-------------------|------|-----|-------------|------------|----------|-----------|
| | - 56 | 3 3 | 3 192.168.1 | 172 Assign | Complete | PLX51-PBM |
| | | | | | | |

Figure 3.5. - Successful IP address assignment

It is possible to force the module back into DHCP mode by powering up the device with DIP switch 2 set to the On position.

A new IP address can then be assigned by repeating the previous steps.

IMPORTANT: It is important to return DIP switch 2 back to Off position, to avoid the module returning to a DHCP mode after the power is cycled again.

In addition to the setting the IP address, a number of other network parameters can be set during the DHCP process. These settings can be viewed and edited in the PLX50 Configuration Utility Application Settings, in the DHCP Server tab.

Once the DHCP process has been completed, the network settings can be set using the Ethernet Port Configuration via the Target Browser.

The Target Browser can be accessed under the Tools menu.

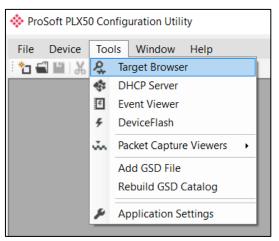


Figure 3.6. - Selecting the Target Browser

The Target Browser automatically scans the Ethernet network for EtherNet/IP devices.

| ¢ | Target Br | owser | - C × |
|---|-----------|-----------------------------------|-------|
| • | ΫØ | | ^ |
| Γ | | 192.168.1.210 : DNP3 Router | |
| | | 192.168.1.172 : PLX51-PBM | |
| | | 192.168.1.211 : DNP3 Router | |
| | + | 192.168.1.188 : ControlNet Router | |
| | | 192.168.1.202 : HDLC Router | |
| | | 192.168.1.203 : HDLC Router | |
| | | 192.168.1.230 : PLX51-DLP-232 | |
| | | 192.168.1.229 : DF1 Messenger | |
| | | 192.168.1.181 : Modbus Router 485 | |
| | | 192.168.1.154 : IP Point HART In | |
| < | 1 | 100 100 1 1FE - LIADT 40-4 | × |

Figure 3.7. - Target Browser

Right-clicking on a device, reveals the context menu, including the Port Configuration option.

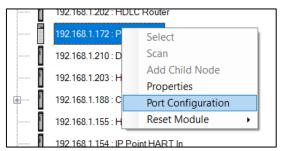


Figure 3.8. - Selecting Port Configuration

All the relevant Ethernet port configuration parameters can be modified using the Port Configuration window.

| letwork Configuration T | уре | | | | | | eed / Duplex Con | • | | |
|-------------------------|-------|--------|---|------|--------|----|------------------|-----------|----------|---|
| O Dynamic | | Method | C | OHCP | \sim | C | Auto-negotiate | | | |
| Static | | | | | | C |) Manual | | | |
| Static Configuration | | | | | | | Manual Configu | Iration | | |
| IP Address | 192 . | 168 | | 1 | 172 | | Port Speed | 100 | | ~ |
| Subnet Mask | 255 . | 255 | | 255 | 0 | | Duplex | Full Du | plex | ~ |
| Default Gateway | 0. | 0 | | 0 | 0 | | | | | |
| Primary NS | 0. | 0 | | 0 | 0 | Ge | neral | | | |
| Secondary NS | 0. | 0 | | 0 | 0 | м | AC Address | 00:0D:8D: | F0:D7:00 | |
| Domain Name | | | | | | | | | | |
| Host Name | | | | | | | | | Refresh | |
| | | | | | | | | | Reifest | 1 |

Figure 3.9. - Port Configuration

Alternatively, these parameters can be modified using Rockwell Automation's RSLinx software.

3.3 GSD File Management

Each PROFIBUS device has a GSD file that is required to provide information needed to configure the device for data exchange. The PLX50 Configuration Utility manages the GSD library which is used for adding devices to the PLX51-PBM.

The GSD File Management Tool is opened by selecting *GSD File Management* under the Tool menu in the configuration utility.

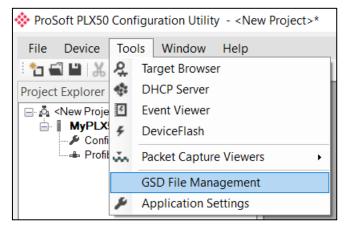


Figure 3.10 – Launching the GSD File Management Tool

Once the tool has been opened, a list of registered slave devices (using their GSD files) will appear.

| talog GSD File | | | | | | | |
|-----------------------------|------------------------------|-------------|--------------|----------|--------|------------|-----------|
| | | | | | | | |
| lter | | | | | | | |
| Vendor | Model | le | dent | Filenam | e | | |
| (All) | × * | | 0x* | | * | Res | et |
| L | | | | | | | |
| Vendor | Model | Revision | GSD File | GSD Rev. | ldent. | Hardware | Software |
| | | | | | | | |
| Allen-Bradley | 1747-APB | 1.0 | AB1100SL.GSD | 0 | 0x1100 | Series A | FRN1.0 |
| ABB Kent-Taylor | 600T PRESSURE FAMILY | V1.0 | ABBI009B.GSD | 2 | 0x009B | REVISIO | REVISIO |
| ABB Automation | 2600T Pressure 263/265 2000T | 1.03 | ABB_04C2.GSD | 3 | 0x04C2 | 8 | 0.24 |
| Schneider Automation GmbH | 170 DNT 110 00 | V1.2 | ASA_7512.GSD | 1 | 0x7512 | 707619 | 708551.02 |
| Schneider Automation GmbH | DEA203 | V1.2 | ASA_A203.GSD | 1 | 0xA203 | 706664.05 | 708070.02 |
| Deutschmann Automation GmbH | Gateway ATV18-Profibus-DP | V0.1 | ATVP2233.GSD | 1 | 0x2233 | Revision - | V0.1 |
| Allen-Bradley | 1794-APB/A | Series A Re | A_B_1101.GSD | 1 | 0x1101 | Series A | Rev. 1.0 |
| | S-Series MFM | Rev. B | BIMF5861.GSD | 2 | 0x5861 | Rev. D | Rev. C |

Figure 3.11 – GSD File Management Tool

To add a GSD file, the user will need to select the *Add* option under the GSD File menu.

| 🚸 GSD File | Manager | | | | | | |
|------------|---------------------|--------|--|--|--|--|--|
| Catalog | GSD File | | | | | | |
| | J View | | | | | | |
| Filter | + Add | | | | | | |
| | Ve X Delete | | | | | | |
| (A | (Ahr | | | | | | |
| | | | | | | | |
| | Vendor | | | | | | |
| Allen-B | Allen-Bradley 1747- | | | | | | |
| ABB Ke | ent-Taylor | 600T P | | | | | |
| ABB Au | utomation | 2600T | | | | | |

Figure 3.12 – GSD File Adding

The required GSD file will need to be selected as shown below:

| - 🔶 👻 🕇 📜 > This P | C > Documents > ProSoft Technology | ~ Ü | Search ProSo | oft Technol | ogy | P |
|-----------------------|------------------------------------|------------------|--------------|-------------|----------|------|
| Organize • New folder | | | | •==- • | | ? |
| ConeDrive - Person | Name | Date modified | Туре | | Size | |
| la This PC | 📔 si2980e5.gsd | 4/6/2018 8:27 AM | GSD File | | | 29 k |
| 3D Objects | | | | | | |
| E Desktop | | | | | | |
| Documents | | | | | | |
| 🔈 Downloads | | | | | | |
| 🜗 Music | | | | | | |
| E Pictures | | | | | | |
| Videos | | | | | | |
| 🐛 OS (C:) 🗸 🧹 | | | | | | |
| File name: | si2980e5.gsd | ~ | General Stat | tion Descri | ption (* | .e ~ |
| | <u> </u> | | Open | | Cance | |

Figure 3.13 – GSD File Adding

Once the file has been selected the GSD File Management tool will add the slave device to the device list and recompile the GSD catalog.

A GSD catalog can be exported from another PLX50 Configuration Utility by exporting the GSD catalog on one PLX50 Configuration Utility and importing it in another. This is done by selecting either *Import* or *Export* under the Catalog menu as shown below:

| 🚸 GSD File Manager | | | | | | | |
|-----------------------------|------------------------------|--|--|--|--|--|--|
| Catalog GSD File | | | | | | | |
| F Rebuild | | | | | | | |
| G Import | | | | | | | |
| C Export | Model | | | | | | |
| Close | * | | | | | | |
| | | | | | | | |
| Vendor | Model | | | | | | |
| Allen-Bradley | 1747-APB | | | | | | |
| ABB Kent-Taylor | 600T PRESSURE FAMILY | | | | | | |
| ABB Automation | 2600T Pressure 263/265 2000T | | | | | | |
| Schneider Automation GmbH | 170 DNT 110 00 | | | | | | |
| Schneider Automation GmbH | DEA203 | | | | | | |
| Deutschmann Automation GmbH | Gateway ATV18-Profibus-DP | | | | | | |

Figure 3.14 – GSD Catalog importing

3.4 Creating a New Project

Before the user can configure the module, a new PLX50 Configuration Utility project must be created. Under the File menu, select New.

| 🔶 Pr | ProSoft PLX50 Configuration Utility | | |
|--------------|-------------------------------------|-------------------|--|
| File | Device | Tools Window Help | |
| ĉ | New | 👌 🕂 🖉 🖾 🛠 | |
| | Open | | |
| \mathbf{X} | Close | | |
| | Save | | |
| | Save As | | |
| | Recent | | |
| | Exit | | |
| | | | |

Figure 3.15 - Creating a new project

A PLX50 Configuration Utility Design Tool project will be created, showing the Project Explorer tree view. To save the project use the Save option under the File menu.

A new device can now be added by selecting Add under the Device menu.

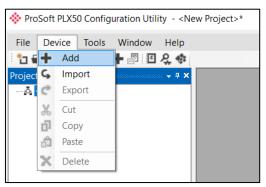


Figure 3.16 - Adding a new device

In the Add New Device window, select the PLX51-PBM and click the Ok button.

| 🔅 Add Ne | w Device | > |
|------------|---------------|--|
| Select Dev | ісе Туре | |
| Image | Device Name | Description |
| I | DF1 Router | DF1 to Logix Communication Module |
| | PLX51-DL-232 | Data Logger Module |
| | PLX51-DLP-232 | Data Logger Plus Module |
| L. | PLX51-HART-4I | HART 4-Channel Input Communication Module |
| | PLX51-HART-40 | HART 4-Channel Output Communication Module |
| | PLX51-PBM | Profibus Gateway Master/Slave Module |
| | PLX51-PBS | Profibus Gateway Slave Module |
| | | Ok Cancel |

Figure 3.17 – PLX51-PBM

The device will appear in the Project Explorer tree as shown below, and its configuration window opened.

The device configuration window can be reopened by either double clicking the module in the Project Explorer tree or right-clicking the module and selecting *Configuration*.

| NPLX51-PBM - Configura | ddressing Profibus Logix Advanced Modbus Auxiliary Map | |
|------------------------|--|--|
| Identity | | |
| Instance Name | MyPLX51-PBM | |
| Description | | |
| IP Address | 0.0.0.0 | |
| Operation | | |
| Mode | StandaloneMaster V | |
| Primary Interface | EtherNet/IP ~ | |
| | | |
| | | |
| | | |
| | | |
| | Ok Apply Cancel | |

Figure 3.18 – PLX51-PBM configuration

3.5 PLX51-PBM Parameters

The PLX51-PBM parameters will be configured by the PLX50 Configuration Utility.

Refer to the additional information section for documentation and installation links for ProSoft Technology's PLX50 Configuration Utility.

3.5.1 General

The General configuration is shown in the figure below. The PLX51-PBM General configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| 💠 PBM01 - Configur | uration | - • 💌 |
|--------------------|--|-------|
| General Modbus I | Modbus Addressing Profibus Logix Advanced Modbus Auxiliary Map EtherNet/IP Devices EtherNet/IP Map | |
| Identity | | |
| Instance Na | lame MyPLX51-PBM | |
| Description | My PLX51-PBM Profibus Gateway | |
| IP Address | s <u>192 . 168 . 1 . 171</u> | |
| Operation | | |
| Mode | StandaloneMaster V | |
| Primary Inte | terface EtherNet/IP ~ | |
| | | |
| | | |
| | | |
| | | |
| | Ok Apply Cancel | |

Figure 3.19 – PLX51-PBM General configuration

The General configuration consists of the following parameters:

Table 3.1 - General configuration parameters

| Parameter | Description |
|-------------------|--|
| Instance Name | This parameter is a user defined name to identify between various PLX51- PBM modules. |
| Description | This parameter is used to provide a more detail description of the application for the module. |
| IP Address | The IP address of the module. |
| Mode | The PLX51-PBM can operate in one of three modes: Quiet This mode allows the user to connect the PLX51-PBM to an active bus and run a DP packet capture. In this mode the PLX51-PBM will not communicate on the DP Bus but rather only listen. Standalone Master In this mode the PLX51-PBM is the DP Master on the PROFIBUS network. Slave In this mode the PLX51-PBM will emulate multiple PROFIBUS Slave |
| | |
| Primary Interface | This is the network the PLX51-PBM will interface the PROFIBUS network. EtherNet/IP (Logix) |

| • | Modbus TCP/IP Master |
|---|--|
| • | Modbus RTU Master – RS232 |
| • | Modbus RTU Master – RS485 |
| • | Modbus TCP/IP Slave |
| • | Modbus RTU Slave – RS232 |
| • | Modbus RTU Slave – RS485 |
| • | EtherNet/IP Explicit Messaging (only when operating as a DP Slave) |

3.5.2 Modbus

The Modbus configuration is shown in the figure below. The PLX51-PBM Modbus configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| ♦ MyPLX51-PBM - Configuration | |
|--|--|
| General Modbus Addressing Profibus Logix Advanced Modbus Auxiliary Map EtherNet/IP Devices EtherNet/IP Map | |
| Basic Settings Modbus Master | |
| Local Node Number 0 V Target Node Number 0 V | |
| BAUD Rate 19200 (kbit/s) Target IP Address 0 . 0 . 0 | |
| Parity None Vupdate Rate 100 (ms) | |
| Slave Timeout 1000 (ms) Retry Limit 3 | |
| Modbus TCP Port 0 (0 = default) Response Timeout 500 (ms) | |
| Terminate RS485 Enable Modbus Auxiliary Mapping | |
| Use Single Write Functions | |
| | |
| | |
| | |
| Ok Apply Cancel | |
| Ok Apply Cancel | |

Figure 3.20 – PLX51-PBM Modbus configuration

| - | |
|------------------------------------|---|
| | Table 3.2 - Modbus configuration parameters |
| Parameter | Description |
| Local Node Number | The Modbus Node Number that will be used when the PLX51-PBM is in the Stand-alone Master mode and a Modbus Slave. |
| BAUD Rate | When the Primary Interface is set to Modbus RTU (232/485) then this setting is the BAUD Rate over the serial communication. |
| Parity | When the Primary Interface is set to Modbus RTU (232/485) then this setting is the Parity over the serial communication. |
| Slave Timeout | The slave timeout time in milliseconds. |
| Modbus TCP Port | The TCP port to be used for the Modbus communication can be configured. If a zero is entered, the module will use the standard TCP port 502. |
| Terminate RS485 | Enables the on-board 124Ω RS485 terminating resistor. |
| Modbus Master | |
| Target Node Number | The remote Modbus node to poll. (Modbus Master only) |
| Target IP Address | The remote Modbus IP Address to poll. (Modbus TCP Master only) |
| Update Rate | The period (in milliseconds) between master requests to the target Modbus device. (Modbus Master only) |
| Retry Limit | The number of successive Modbus request retries (Modbus Master only) |
| Response Timeout | The time (in milliseconds) the module will wait for a Modbus response (Modbus Master only) |
| Enable Modbus Auxiliary Mapping | When this is enabled the PLX51-PBM will be able to read from, and write to, multiple Modbus Slaves by using the Modbus Auxiliary Map tab. |
| | IMPORTANT: When Modbus Auxiliary Mapping is enabled, the automatic polling of referenced Modbus registers is disabled. It is the user's responsibility to ensure that all the required Profibus control and data registers are collected from the appropriate remote Modbus slave devices. |

The Modbus configuration consists of the following parameters:

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| Use Single Write | When operating as a Modbus Master, the PLX51-PBM will use Modbus |
|------------------|--|
| Functions | Single Write functions in the Modbus Auxiliary Map when this option has been |
| | selected and the write function has an element count of 1. |

3.5.3 Modbus Addressing

The Modbus Addressing configuration is shown in the figure below. The PLX51-PBM Modbus Addressing configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| MyPLX51-PBM - Configuration | | | - • × |
|----------------------------------|---------------------------|------------------------|-------|
| General Modbus Modbus Addressing | 9 Profibus Logix Advanced | Modbus Auxiliary Map | |
| Modbus Addressing | | | |
| Base Offset Type | Modbus (Base 0) $$ | | |
| REAL / DINT Format | AA BB CC DD 🛛 🗸 | Master Control | |
| Master Control Register | HR 0 | Slave Device Enables | |
| Status Register | CS ~ 0 | Slave Device Control | |
| Device Control Register | CS ~ 4096 | | |
| DPV0 Diagnostic Register | HR 0 | DPV0 Diagnostic Enable | |
| DPV1 Message Register | HR 0 | DPV1 Message Enable | |
| DPV1 Alarm Register | HR 0 | DPV1 Alarm Enable | |
| | | | |
| | | | |
| | Ok | Apply Cancel | |

Figure 3.21 – PLX51-PBM (Master Mode) Modbus Addressing configuration

| PBM01 - Configuration | | | — — × |
|----------------------------------|-------------------------|--|--------------|
| General Modbus Modbus Addressing | Profibus Logix Advanced | Modbus Auxiliary Map EtherNet/IP Devices EtherNet/IP Map | |
| Modbus Addressing | | | |
| Base Offset Type | Modbus (Base 0) $$ | | |
| REAL / DINT Format | AA BB CC DD 🛛 🗸 | Master Control | |
| Master Control Register | HR 0 | Slave Device Enables | |
| Status Register | CS ~ 0 | Slave Device Control | |
| Device Control Register | CS ~ 4096 | | |
| DPV0 Diagnostic Register | HR 0 | DPV0 Diagnostic Enable | |
| DPV1 Message Register | HR 0 | DPV1 Message Enable | |
| DPV1 Alarm Register | HR 0 | DPV1 Alarm Enable | |
| Modbus Communication Status | s HR 0 | | |
| | | | |
| | | Ok Apply Cancel | |

Figure 3.22 – PLX51-PBM (Slave Mode) Modbus Addressing configuration

| Parameter | Description |
|--------------------------------|--|
| Base Offset Type | Base Address Offset Type |
| | Modbus (Base 0) – Conventional Modbus addressing where the first address is 0. |
| | PLC (Base 1) – PLC addressing, where the first address is 1. |
| Real Format | For a Real (single floating point) number this setting shows the format of the data will be presented when using a Modbus Primary Interface. |
| | The format (byte re-ordering) options are as follows: |
| | AA BB CC DD |
| | BB AA DD CC |
| | DD CC BB AA |
| | CC DD AA BB |
| Master Control HR Offset | The Modbus Holding Register address starting offset for the Master Control. (PROFIBUS Master mode only) |
| Status Register | The Modbus Coil or Holding Register address starting offset for the Module status. |
| Device Control Register | The Modbus Coil or Holding Register address starting offset for the Slave Device Control bits. |
| DPV0 Diagnostic Register | The Modbus Holding Register address starting offset for DPV0 Diagnostics. (PROFIBUS Master mode only) |
| DPV1 Message Register | The Modbus Holding Register address starting offset for DPV1 Messaging. (PROFIBUS Master mode only) |
| DPV1 Alarm Register | The Modbus Holding Register address starting offset for DPV1 Alarms. (PROFIBUS Master mode only) |
| Modbus Communication Status | The Modbus Holding Register address starting offset for Modbus Communication Status (when operating as a Modbus Master or Modbus Slave). This can be mapped to DPV0 data which can be used by the Profibus DP Master or Slave to take action when the Modbus communication is down or has faulted. See the <i>Modbus Operation</i> section for details regarding the Modbus data for the Modbus Communication Status. |
| Master Control | Enables the Master Control bits. (PROFIBUS Master mode only) When Enabled, the PROFIBUS operational state (Offline, Stop, Run, Clear) is controlled by the module through the use of the Master Control Register. When Disabled, the PROFIBUS operational state is set to Run. |
| Slave Device Enables | Enables the individual Slave Device Enable bits. When Enabled, the remote device can enable/disable each slave device through the use of the Device Control Register. When Disabled, all slave devices are enabled. |
| Slave Device Control | Enables the Slave Device Control (Alarm Triggers) (PROFIBUS Slave mode only) |
| | When Enabled, the Slave device can generate Alarms through the use of the Device Control Register. |
| | When Disabled, no slave device alarming is possible. |
| DPV0 Diagnostic Enable | (PROFIBUS Master mode only) This will allow the user to enable or disable the retrieving of PROFIBUS Diagnostics from a field device using DPV0 Diagnostic HR Offset. |
| DPV1 Message Enable | (PROFIBUS Master mode only) This will allow the user to enable or disable the retrieving of data using DPV1 Class 1 messaging from a field device using DPV1 Message HR Offset. |
| DPV1 Alarm Enable | (PROFIBUS Master mode only) This will allow the user to enable or disable the retrieving of PROFIBUS Alarms from a field device using DPV1 Alarm HR Offset. |

The Modbus configuration consists of the following parameters:

IMPORTANT: The range of configured Modbus registers for each register type may not exceed 10,000.

3.5.4 PROFIBUS – Master Mode

The PROFIBUS configuration (in Master Mode) is shown in the figure below. The PLX51-PBM PROFIBUS configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| Basic Settings | | Timing | | |
|-------------------------|---------------------------|--------------------|-------------------|----------------|
| 2 | | TTR | 26838 (tbits) [>2 | 1338] |
| Station Address (TS) | 1 ~ | Slot Time (TSL) | 1000 (tbits) | |
| Highest Address (HSA) | 125 ~ | Slot Time (TSL) | | |
| | | Gap Update Factor | 10 [1-100] | |
| BAUD Rate | 12000 v (kbit/s) | Quiet Time (TQUI) | 9 (tbits) | Auto Recommend |
| Advanced Settings | | Setup Time (TSET) | 16 (tbits) | |
| Logix Comms Fail | Force to Offline $ \lor $ | Profibus Cycle | 4 (ms) [>4] | |
| Logix Program Mode | Force to Offline \sim | | | |
| Modbus Comms Fail | F | Default Watchdog | 20 (ms) | |
| Moubus Comms Fail | Force to Offline \lor | Minimum TSDR | 11 (tbits) | |
| Extra DPV1 Poll / Cycle | 0 ~ | Maximum TSDR | 800 (tbits) | |
| DP Slaves Online dur | ing Communication Failure | Idle Time 1 (Tid1) | 76 (tbits) | |
| Error Management | | Idle Time 2 (Tid2) | 800 (tbits) | |
| Token Retry Limit | 3 [1-5] | | | |
| Message Retry Limit | 1 [1-5] | | | |
| incodigo nicaly Linic | | | | |

Figure 3.23 – PLX51-PBM PROFIBUS configuration – Master Mode

The PROFIBUS configuration consists of the following parameters:

| Table 3.4 - PRO | FIBUS co | onfiguration | narameters |
|-----------------|----------|--------------|------------|
| | | Jingulation | parameters |

| Parameter | Description |
|-----------------------|---|
| Basic Settings | |
| | |
| Station Address (TS) | PROFIBUS Station Address for the PLX51-PBM module. TS should be different than any other slaves address on the PROFIBUS network, it should also be less-than or equal to the HSA below: |
| | Min: 0 |
| | Max: 126 |
| | Default: 1 |
| Highest Address (HSA) | Highest Station Address. This is the highest station address of the active stations (masters). Passive stations (slaves) can have a higher address than the HSA. |
| | A low HSA is better for PROFIBUS performance. |
| | Min: 1 |
| | Max: 126 |
| | Default: 126 |
| BAUD Rate | Baud Rate (in Kbps) of the PROFIBUS network: 9.6, 19.2, 45.45, |
| | 93.75, 187.5, 500, 1500, 3000, 6000 or 12000 Kbps. The baud rate selected |
| | should be supported by all slaves in the configuration. The baud rate should be |
| | selected depending on the cable length, see chapter "PROFIBUS DP" |
| Advanced Settings | |
| Logix Comms Fail | Specifies the PROFIBUS Master behavior when losing communication with Logix, either: |
| | Force to Offline |

| | Force to Clear |
|--|--|
| Logix Program Mode | Specifies the PROFIBUS Master behavior when Logix is set in Program mode, either: |
| | Force to Offline |
| | Force to Clear |
| Modbus Comms Fail | Specifies the PROFIBUS Master behavior when losing communication with the Modbus device, either: |
| | Force to Offline |
| | Force to Clear |
| Extra DPV1 Poll / Cycle | The number of additional DPV1 Polls (Class 2) per PROFIBUS Cycle. Increasing this parameter results in faster Asset Management DTM updates. |
| DP Slaves Online during Communication Failure (Slave Mode Only) | This parameter will allow the DP DPV0 communication to continue when communication it lost on either Modbus (Master or Slave) or EtherNet/IP Explicit Messaging. When this is not set, the DP DPV0 communication will be stopped when the communication to the previously mentioned interfaces is lost. |
| Error Management | |
| Token Retry Limit | Token Retry Limit is the number of times that a PROFIBUS Master tries to pass the token before deciding that a station is not there. Value must be in the following range: |
| | Min: 0 |
| | Max: 5 Default: 3 |
| Magaga Patry Limit | |
| Message Retry Limit | Message Retry Limit is the number of telegram repetitions if the address doesn't react. Value must be in the following range: Min: 0 |
| | Max: 5 |
| | Default: 1 |
| Timing | |
| TTR | Target Rotation Time indicates the maximum time available for a token circulation (time for PROFIBUS token to be passed to another master and be back). It takes in account the number of slaves with their IO size (data exchanges telegram), different telegrams needed and their duration times (FDL status, global control, pass token), all mandatory timing with respect to the PROFIBUS standard (time slot, min and max Tsdr, Tqui, Tset,) and a safety margin which allows bandwidth for acyclic messages (DPV1,). Min: 0 |
| | Max: 16777215 |
| Slot Time (TSL) | Slot Time (in tbits) is the maximum time the PLX51-PBM will wait, after the transmission of a request, for the reception of the first byte (Tchar) of an answer. (It allows detecting a timeout.) It can be increased when repeaters are used in the PROFIBUS network topology. The value must respect the rule: Min: 37 |
| | Max: 16383 |
| Gap Update Factor | Gap Update Factor: The range of addresses between 2 consecutive active stations is called GAP. This GAP is submitted to a cyclic check during which the system identifies the station condition (not ready, ready or passive). Min: 1 |
| | Max: 100 |
| Quiet Time (TQUI) | Quiet time (in tbits) is the time that a station may need to switch from sending to receiving. It must respect the rule: TQUI < MIN_TSDR Min: 0 Max: 255 |

| Setup Time (TSET) | Setup Time (in tbits) is the reaction time on an event. Calculation of TSET must respect the rule: Min: 1 |
|-----------------------------------|---|
| | Max: 494 |
| PROFIBUS Cycle | PROFIBUS Cycle (in ms) (read/Write) field defines the cyclic time the master will respect between two IO Data Exchange sequences. This parameter can be increased by the user when the PROFIBUS network load does not allow the processing of acyclic requests. |
| Auto Recommend | When Enabled, all timing parameters will be updated with recommended calculations when the Ok or Apply button is pressed. |
| | IMPORTANT: When the user changes the BAUD Rate, all PROFIBUS timing parameters will be updated irrespective of the Auto Recommend check-box selection. |
| Default Watchdog (Read-Only) | Default Devices Watchdog (in ms) value defines the watchdog value assigned by default to all devices in the configuration. |
| Min TSDR (Read-Only) | Smallest Station (in tbits) is the minimum time that a PROFIBUS DP slave must wait before it may answer. It must respect the rule: TQUI < MIN_TSDR Min: 11 Max: 1023 |
| Max TSDR (Read-Only) | Largest Station (in tbits) is the maximum time that a PROFIBUS DP slave may take in order to answer. Calculation of MAX_TSDR must respect the rule: Min: 37 Max: 65525 |
| Idle Time 1 (Tid1) | Time Idle1 (in tbits) is the time between the acknowledgement frame or token |
| (Read-Only) | frame reception and the transmission of the next frame. |
| (| Tid1 = Max(Tsyn+Tsm, MIN_TSDR) |
| | with |
| | Tsyn= 33 |
| | - , |
| | Tsm= 2 + 2* TSET + TQUI |
| Idle Time 2 (Tid2) (Read-Only) | Time Idel2 (in tbits) is the time between the transmission of an unconfirmed packet and the transmission of the next packet. |
| | Time Idel2 (in tbits) is the time between the transmission of an unconfirmed packet and the transmission of the next packet. Tid2 = Max (Tsyn+Tsm, MAX_TSDR) |
| | Time Idel2 (in tbits) is the time between the transmission of an unconfirmed packet and the transmission of the next packet. |

IMPORTANT: When the user changes the BAUD Rate **all** the PROFIBUS timing parameters will change to the default values for that specific BAUD Rate.

3.5.5 PROFIBUS – Slave Mode

The PROFIBUS configuration (in Slave Mode) is shown in the figure below. The PLX51-PBM PROFIBUS configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| Basic Settings | | Timing | | | |
|---------------------------|-----------------------|--------------------|-----------------------|----------------|--|
| Station Address (TS) 1 | \sim | TTR | 34829 (tbits) [>29329 |] | |
| | | Slot Time (TSL) | 300 (tbits) | | |
| Highest Address (HSA) 12 | b ~ | Gap Update Factor | 10 [1-100] | | |
| BAUD Rate 15 | 00 ~ (kbit/s) | Quiet Time (TQUI) | 0 (tbits) | Auto Recommend | |
| Advanced Settings | | Setup Time (TSET) | 1 (tbits) | | |
| Logix Comms Fail Fo | rce to Offline \sim | Profibus Cycle | 21 (ms) [>16] | | |
| Logix Program Mode Fo | rce to Offline \sim | Default Watchdog | | | |
| Modbus Comms Fail Fo | rce to Offline | | (| | |
| | | Minimum TSDR | 11 (tbits) | | |
| Extra DPV1 Poll / Cycle 0 | \sim | Maximum TSDR | 200 (tbits) | | |
| DP Slaves Online during | Communication Failure | Idle Time 1 (Tid1) | 37 (tbits) | | |
| Error Management | | Idle Time 2 (Tid2) | 200 (tbits) | | |
| Token Retry Limit | 3 [1-5] | | | | |
| Message Retry Limit | 1 [1-5] | | | | |
| | | | | | |

Figure 3.24 – PLX51-PBM PROFIBUS configuration – Slave Mode

The PROFIBUS configuration consists of the following parameters:

| Parameter | Description | |
|---|---|--|
| BAUD Rate | Baud Rate (in Kbps) of the PROFIBUS network: 9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 3000, 6000 or 12000 Kbps. The baud rate selected should be supported by all slaves in the configuration. The baud rate should be selected depending on the cable length, see chapter "PROFIBUS DP" | |
| DP Slaves Online during Communication Failure | This parameter will allow the DP DPV0 communication to continue when communication it lost on either Modbus (Master or Slave) or EtherNet/IP Explicit Messaging. When this is not set, the DP DPV0 communication will be stopped when the communication to the previously mentioned interfaces is lost. | |

Table 3.5 - PROFIBUS configuration parameters – Slave Mode

3.5.6 Logix

The Logix configuration is shown in the figure below. It is only relevant when the Primary Interface is set to EtherNet/IP.

The PLX51-PBM Logix configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| MyPLX51-PBM - Configuration | | - C X |
|---------------------------------|--|-------|
| General Modbus Modbus Addressin | g Profibus Logix Advanced Modbus Auxiliary Map | |
| Logix | | |
| EtherNet/IP Connections | 1 ~ | |
| Controller Path | 192.168.1.102.1.0 | |
| Response Timeout | 500 (ms) | |
| | | |
| | | |
| | | |

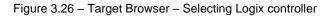
Figure 3.25 – PLX51-PBM Logix configuration

| | Table 3.6 - Logix configuration parameters |
|-------------------------|--|
| Parameter | Description |
| EtherNet/IP Connections | The number of EtherNet/IP (CIP) Connections to be used in the exchange with Logix (1 to 4). |
| | Note, this value must match that configured in the Logix IO tree. |
| Controller Path | This is the CIP path to the Logix controller. In PROFIBUS Slave Mode, this path will be used for the Class 3 data exchanges for DPV1 objects and alarms. Note: This path can be either entered manually, or configured using the Target Browser. |
| Response Timeout | The maximum time (ms) allowed for a Class 3 response from the Logix controller. |

The Logix configuration consists of the following parameters:

To browse to a controller path, select the Browse ("…") button to open the Target Browser. Then select a Logix controller and select Ok. The path will then be updated automatically.

| 🚸 Target Brow | ser – 🗖 | x |
|---------------|-------------------------------------|------|
| !*¥⊘ | | Done |
| 192 | .168.1.212 : DNP3 Router | ^ |
| 192 | 168.1.232 : DNP3 Router | |
| 192 | .168.1.181 : Modbus Router 485 | |
| 192 | .168.1.102 : 1756-EN2TR/C 217021900 | |
| | 00 : 1756-L62/B LOGIX5562 | |
| ⊡ | 01 : 1756-EN2TR/B | |
| | 02 : 1756-L75/B LOGIX5575 | ≡ |
| | 03 : 1756-EN2TR/C 217021900 | |
| ÷ | 04 : 1756-CNBR/E 11.005 | |
| | 06 : 1756-CNB/E 11.003 | |
| | 09:1756-IB16I/A DCIN ISOL | ~ |
| | Ok Cancel | |



3.5.7 Advanced

The Advanced configuration is shown in the figure below. The PLX51-PBM Advanced configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| MyPLX51-PBM - Configuration | |
|---|--|
| General Modbus Modbus Addressing Profibus Logix Advanced Modbus Auxiliary Map | |
| Device Level Ring | |
| ☑ DLR Enable | |
| Time Synchronization | |
| ✓ NTP Enable | |
| NTP - Network Time Protocol | |
| Server IP Address 192 . 168 . 1 . 88 | |
| Update Interval 60 (s) | |
| | |
| | |
| | |
| | |
| | |
| Ok Apply Cancel | |

Figure 3.27 – PLX51-PBM Advanced configuration

The Advanced configuration consists of the following parameters:

| Parameter | Description | | | | |
|-------------------------|---|--|--|--|--|
| DLR Enable | This must be set to enable Device Level Ring operation when the PLX51-PBM will be operating in an Ethernet DLR. | | | | |
| NTP Enable | The PLX51-PBM can synchronize its onboard clock to an NTP Server by enabling NTP. | | | | |
| NTP – Server IP Address | This setting is the IP address of the NTP Server which will be used as a time source. | | | | |
| NTP – Update Interval | This setting is the updated interval (in seconds) that the PLX51-PBM will request time from the NTP Server. | | | | |

3.5.8 Modbus Auxiliary Map

The Modbus Auxiliary Map configuration is shown in the figure below. This table will be enabled when *Enable Modbus Auxiliary Mapping* has been enabled in the Modbus tab and configured for Modbus Master. This will allow the user to read and/or write any internal PLX51-PBM Modbus Register to any Modbus Slave. Up to 20 Modbus Slaves can be connected and up to 200 mapped items can be configured.

IMPORTANT: When Modbus Auxiliary Mapping is enabled, the automatic polling of referenced Modbus registers is disabled. It is the user's responsibility to ensure that all the required PROFIBUS control and data registers are collected from the appropriate remote Modbus slave devices.

The PLX51-PBM Modbus Auxiliary Map configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| nera | al Modbus M | odbus | Addressing | Profib | us Logix Adva | anced Modb | us Auxiliary Map | | | | |
|----------|-----------------|--------|---------------|--------|---------------|------------|------------------|---------------|------|----------|--------|
| Mo | dbus Auxiliary | Map - | | | | | | | | | |
| | | · · | Dogistor T | | Local Reg. | Count | Remote Reg. | IP Address | Node | Reformat | |
| <u> </u> | Modbus Function | | Register Type | | <u> </u> | Count | <u> </u> | | | | |
| | Read | \sim | HR | \sim | 1000 | 10 | 1000 | 192.168.1.222 | 3 | None | \sim |
| | Write | \sim | HR | \sim | 1200 | 10 | 1200 | 192.168.1.221 | 4 | None | \sim |
| ** | | \sim | | \sim | | | | | | | \sim |

Figure 3.28 – PLX51-PBM Modbus Auxiliary Map configuration

The Modbus Auxiliary Map configuration consists of the following parameters:

| Parameter | Description | | | | | |
|-----------------|---|--|--|--|--|--|
| Modbus Function | This is the Modbus function that is used with the Modbus Slave. Read – Read a Modbus Register (eg. HR, IR, CS, or IS) from a Modbus Slave. | | | | | |
| | | | | | | |
| | Write – Write a Modbus Register (eg. HR or CS) to a Modbus Slave. | | | | | |
| Register Type | Modbus Register Type: | | | | | |
| | CS – Coil Status | | | | | |
| | IS – Input Status | | | | | |
| | IR – Input Register | | | | | |
| | HR – Holding Register | | | | | |
| Local Reg. | The local PLX51-PBM Modbus address. | | | | | |
| Count | The number of Modbus elements to read or write. | | | | | |
| Remote Reg. | The remote slave Modbus address. | | | | | |
| IP Address | The IP address of the remote Modbus TCP slave. | | | | | |
| Node | The Modbus Node address of the remote Modbus slave. | | | | | |
| Reformat | How the data is formatted before reading or writing from/to the Modbus slave. | | | | | |
| | None – No reformatting will be done. | | | | | |
| | BB AA – 16bit Byte swap | | | | | |
| | BB AA DD CC – 32bit Byte Swap | | | | | |
| | CC DD AA BB – Word Swap | | | | | |
| | DD CC BB AA – Word and Byte Swap | | | | | |

Table 3.8 - Modbus Auxiliary Map configuration parameters

3.5.9 EtherNet/IP Devices

This tab is enabled when the Primary Interface selected is EtherNet/IP Explicit Messaging.

IMPORTANT: EtherNet/IP Explicit Messaging is only allowed when the PLX51-PBM is operating as a Profibus Slave.

The EtherNet/IP Devices configuration is shown in the figure below. Up to 5 EtherNet/IP devices can be configured with up to 50 EtherNet/IP mapped items allowing for either explicit EtherNet/IP Class 3 or Unconnected Messaging (UCMM) to any of the 5 configured devices. The data from each EtherNet/IP device is written to or read from a data table with a size of 10Kbytes. See the *Explicit EtherNet/IP Messaging Operation* section for more details.

The PLX51-PBM EtherNet/IP Devices configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| 🔅 MyPL | X51-I | PBM - Configuration | | | | | | | | |
|--------|--------|-------------------------|-----------------|----------------|----------------------|-------------|--------------|---------------|--------------------|--|
| Genera | al Mo | odbus Modbus Addres | sing Profibus I | Logix Advanced | Modbus Auxiliary Map | EtherNet/IP | Devices Ethe | erNet/IP Map | | |
| Sch | nedule | ed Device Settings | | | | | | | | |
| | Ether | Net/IP Communication | UCCM | ~ | Scan C | lass A | 500 | ms Scan Class | C 2000 ms | |
| | Ether | Net/IP Explicit Timeout | t 2000 | ms | Scan C | lass B | 1000 | ms Scan Class | D 5000 ms | |
| | Devid | ce List (max 5) | | | | | | | | |
| | | Device Name | | CIP Path | | Browse | Timeout | Retry Count | Comm Status Offset | |
| | • | PowerFlex700 | 192.168.1.100 | | | | 500 | 3 | 1000 | |
| | * | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | Ok Ap | ply | Cancel | | | |
| | | | | | | | | | | |

Figure 3.29 – PLX51-PBM EtherNet/IP Devices configuration

The EtherNet/IP Devices configuration consists of the following parameters:

Table 3.9 - EtherNet/IP Devices configuration parameters

| Parameter | Description |
|---------------------------------|--|
| EtherNet/IP Communication | The module can use either <i>Class 3</i> or <i>Unconnected Messaging</i> when communicating to the target EtherNet/IP device. |
| EtherNet/IP Explicit Timeout | The amount of time with no successful EtherNet/IP responses before the module sets the EtherNet/IP interface in fault. If <i>DP Slaves Online during Communication Failure</i> has not been set, then all DP slaves being emulated will go offline on the Profibus DP network. |
| Scan Class A, B, C, D | The configurable update rates for each mapped item in the EtherNet/IP Map. |
| Device List (per dev | vice) |
| Device Name | The user assigned name for the specific device. |

| | The CIP Path to the target device. It can either be entered manually or the user can browse to them by clicking the Browse button. The Target Browser will open and automatically scan for all available EtherNet/IP devices. |
|-------------|--|
| CIP Path | If the Ethernet/IP module is a bridge module, it can be expanded by right- clicking on the module and selecting the Scan option. |
| | The required EtherNet/IP device can then be chosen by selecting it and clicking the Ok button, or by double-clicking on the target module. |
| Timeout | The amount of time the PLX51-PBM module will wait for a response from the target EtherNet/IP device. |
| Retry Count | The number of retires before the target EtherNet/IP device is considered offline. |
| Comm Status | This is the offset in the data table (used to map EtherNet/IP device data) which provides the communication status of each EtherNet/IP device. The Communication Status is as shown below: |
| Offset | Bit 0 - (1) Device online / (0) Device offline. |
| | Bit 1 to 7 – Reserved. |

3.5.10 EtherNet/IP Map

This tab is enabled when the Primary Interface selected is EtherNet/IP Explicit Messaging.

IMPORTANT: EtherNet/IP Explicit Messaging is only allowed when the PLX51-PBM is operating as a Profibus Slave.

The EtherNet/IP Map configuration is shown in the figure below. Up to 5 EtherNet/IP devices can be configured with up to 50 EtherNet/IP mapped items allowing for either explicit EtherNet/IP Class 3 or Unconnected Messaging (UCMM) to any of the 5 configured devices. The data from each EtherNet/IP device is written to or read from a data table with a size of 10Kbytes. See the *Explicit EtherNet/IP Messaging Operation* section for more details.

The PLX51-PBM EtherNet/IP Map configuration window is opened by either double clicking on the module in the tree or right-clicking the module and selecting *Configuration*.

| | duled Map | | | | | | | | | | | | | |
|------------|--------------|---------|--------|------|---------|-------|----------|-----------|-----------------|---------------|------------------|---------------|-----------|-----------------|
| | Device | Functio | m | Scan | Service | Class | Instance | Attribute | Input Offset | Get Length | Output Offset | Set Length | Data Type | Static Value |
| | PowerFlex700 | Get | \sim | Α ~ | | 1 | 1 | 1 | 4 | 2 | | | | |
| F # | ~ | | ~ | ~ | | | | | | | | | ~ | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Figure 3.30 – PLX51-PBM EtherNet/IP Map configuration

The EtherNet/IP Map configuration consists of the following parameters:

| Table 3 10 - | - EtherNet/IP M | lan configu | ration nar | ameters |
|---------------|-----------------|-------------|------------|---------|
| 1 able 5.10 - | | iap coningu | ration par | ameters |

| Parameter | Description |
|-------------------------------|---|
| Parameter | The device name configured in the previous EtherNet/IP Devices tab. |
| Device | The selected device will be used for executing the communication function. |
| | The user can select one of four functions. Get The module will read data from the target EtherNet/IP device by using the Get Single Attribute CIP function. The received data will be placed into the Data Table at the <i>Input Offset</i> location configured in this tab. Set The module will write data to the target EtherNet/IP device by using the Set Single Attribute CIP function. The data to be written will be retrieved from the Data Table at the <i>Output Offset</i> location configured in this tab. |
| Function | Set Static Similar to the Set function above, but the data to be written will be fixed (equal to the Static Value) parameter in this configuration window. This function will typically be used with the single Scan class which means the PLX51-PBM can be setup to write the fixed value only once when the target device communication has been established. Custom This function allows the user to use a custom Service and write and read data in the same transaction. The user will need to see which custom services that target device supports in that device's user manual. |
| Scan | The user can select Scan Class A , B , C or D (which was configured in the EtherNet/IP Devices tab). The specific mapped item will then be executed at that configured scan class rate. The user can also select the S class which means that the mapped item will only execute once when communication to the target device is established. If the target device goes offline, then the mapped items with this class will be rearmed. |
| Service | The custom CIP service/function which is only available when the <i>Custom</i> function has been selected. |
| Class, Instance, Attribute | The CIP class, instance, and attribute of the request message to be sent. |
| CN In Offset | The location in the Data Table where the received data will be written. This will only be available for Get and Custom functions. |
| Get Length | The length of the data to be received. If the number of bytes received is more than the Get Length, then the data will not be written to the Data Table. This will only be available for Get and Custom functions. |
| CN Out Offset | The location in the Data Table where the data to be written to the target device will be read from. This will only be available for Set and <i>Custom</i> functions. |
| Set Length | The length of the data to be written. This will only be available for Set and Custom functions. |
| Data Type | The data type of the Static Value. This will only be available for Set Static function. |
| Static Value | The value to be written to the target device when the <i>Set Static</i> function has been selected. Note : When using the SINT Array data type, the values must be entered as space-delimited hex values. For example: 05 34 2E A1 |

3.6 Module Download

Once the PLX51-PBM configuration has been completed, it must be downloaded to the module. The configured IP address of the module will be used to connect to the module.

To initiate the download, right-click on the module and select the Download option.

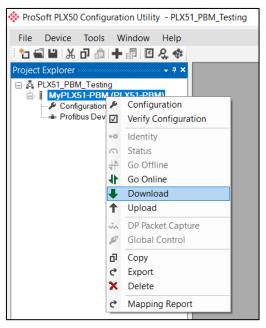


Figure 3.31 - Selecting Download

Once complete, the user will be notified that the download was successful.

| 🌲 n | |
|----------------|-----------------------------|
| VICE ProSoft P | LX50 Configuration \times |
| | Download Successful. |
| | Ok |

Figure 3.32 - Successful download

Within the PLX50 Configuration Utility environment the module will be in the Online state, indicated by the green circle around the module. The module is now configured and will start operating immediately.

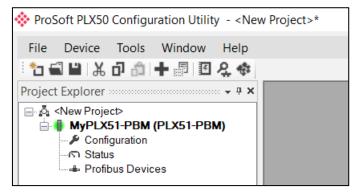


Figure 3.33 - Module online

3.7 Device Discovery (Online) – Master Mode

Once online with the PLX51-PBM in the PLX50 Configuration Utility the user will be able to scan the PROFIBUS network for slave devices.

IMPORTANT: If the incorrect PROFIBUS parameters has been configured (e.g. BAUD rate) it will result in the PLX51-PBM not seeing any slave devices on the PROFIBUS network.

IMPORTANT: If the module is connected to the primary interface (e.g., EtherNet/IP) when attempting a Device Discovery, ensure that the Master Control is set to a value greater than zero to ensure the Profibus State is **not** OFFLINE.

3.7.1 Discovery

The slave device discovery can be found by selecting the *Discovered Nodes* tab in the PLX51-PBM status window.

| MyPLX51-PBM - | Status | | | | |
|-----------------|---------------------|-----------------------|----------------------------------|----------|-----|
| General General | Statistics DPV1 Sta | tistics Live List Dis | covered Nodes Ethernet Clients T | CP / ARP | |
| Start Discov | very S | Status | | | |
| Station | ldent | Status | Vendor | Model | GSD |
| | | | | | |
| | | | | | |

Figure 3.34 – Device Discovery

To start a new device discovery the *Start Discovery* button must be pressed. Once the discovery is done the slave devices found will be listed below.

NOTE: The time to scan the bus will depend on the BAUD Rate selected. The higher the BAUD rate the faster the bus discovery scan time will be.

| eneral (| General Statistics | DPV1 Statistics | Live List Discovered No | des Modbus Statistics | Ethemet Clients TCF | P / ARP | |
|----------|--------------------|-----------------|-------------------------|-----------------------|---------------------|--------------|--------|
| Start | Discovery | Status | | Done | | | |
| St | tation | Ident | Status | Vendor | Model | GSD | Upload |
| | 1 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |
| | 2 | 0x08A5 | Ident Mismatch | ProSoft Technolog | PLX51-PBM | PSFT10FE.GSD | - |
| | 3 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |
| | 4 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |
| | 5 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |
| | 6 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |
| | 7 | 0x08A5 | Unconfigured | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |

Figure 3.35 – Devices Found

If a device has been found that is not currently in the PLX51-PBM configured device list the user will be able to add the device from this window by right-clicking on the device and selecting *Add Device*.

NOTE: The GSD file will need to be already registered before a device can be added to the PLX51-PBM configuration.

| neral General Statis | tics DPV1 Statistic: | s Liv | e List Discovered No | des Modbus Stati | stics E | thernet Clients TCP / A | RP | |
|----------------------|----------------------|-------|----------------------|------------------|---------|-------------------------|--------------|-------|
| Start Discovery |] Status | | | Done | | | | |
| Station | Ident | | Status | Vendor | | Model | GSD | Uploa |
| 1 | 0x08A5 | - | | 070 | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 2 | 0x08A5 | + | Add Device | | gy, | PLX51-PBM | PSFT10FE.GSD | |
| 3 | 0x08A5 | ۶ | Change Station Ad | dress | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 4 | 0x08A5 | 1+ | Upload Configurat | ion | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 5 | 0x08A5 | tet. | Upload Configurat | ion from All | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 6 | 0x08A5 | = | Discovery Report | | | QTS-AN-X-PBx | qts_08a5.gse | - |

Figure 3.36 – Adding the Field Devices Found

The user will need to select the GSD file add the device to the PLX51-PBM configured device list.

| | | | | | × |
|--------------|------------|-----------------|--|--|----------|
| Ŧ | Model × | Ident 0x08A5 | Filename × | Reset | Add File |
| Model | Revision | GSD File | GSD Rev. | Ident. | Hardware |
| QTS-AN-X-PBx | Rev 1.3 | qts_08a5.gse | | 0x08A5 | 1.0 |
| | | | | | |
| | | | | | |
| | | | | | |
| | ▼ Model | Model Revision | ▼ Model Revision GSD File | ▼ Model Revision GSD File GSD Rev. | |

Figure 3.37 - Selecting the GSD for the slave device

Once the devices have been correctly set up (as well as the correct mapping is in Logix) the devices will show up as exchanging data.

| MyPLX51_PBM - Stat | us. | | | | _ | , • • |
|------------------------|------------------------|-------------------------|-----------------------|--------------------------|--------------|--------------|
| General General Statis | tics DPV1 Statistics I | Live List Discovered No | des Modbus Statistics | Ethernet Clients TCP / A | RP | |
| Start Discovery | Status | | Done | | | |
| Station | Ident | Status | Vendor | Model | GSD | Upload |
| 1 | 0x08A5 | Data Exch | QTS | QTS-AN-X-PBx | qts_08a5.gse | |
| 2 | 0x08A5 | Data Exch | QTS | QTS-AN-X-PBx | qts_08a5.gse | |
| 3 | 0x08A5 | Data Exch | QTS | QTS-AN-X-PBx | qts_08a5.gse | |
| 4 | 0x08A5 | Data Exch | QTS | QTS-AN-X-PBx | qts_08a5.gse | |
| 5 | 0x08A5 | Data Exch | QTS | QTS-AN-X-PBx | qts_08a5.gse | - |

Figure 3.38 – Discovering running devices

3.7.2 Device Station Configuration Upload

The PLX50CU can also upload the DPV0 communication configuration from each DP Slave. The uploaded configuration will be used when creating a new module from the Discovery List (as described in the section above).

IMPORTANT: The configuration must be uploaded from the DP Slave **before** adding the module from the discovery list. The configuration of an already instantiated DP Slave will not be changed.

The DPV0 communication configuration can be uploaded by right clicking on the discovery list and selecting *Upload Configuration from All.*

| eral General S | Statistics DPV1 Sta | tistics Live List D | scovered Nodes Modbus Statis | tics Ethernet Clients TCP / | ARP | |
|----------------|---------------------|---------------------|------------------------------|-----------------------------|--------------|--------|
| Start Discov | ery | Status | Done | | | |
| Station | Ident | Status | Vendor | Model | GSD | Upload |
| 2 | 0x10FF | Data Exch | ProSoft Technology, Inc. | PLX51-PBS | PSFT10FF.GSD | - |
| 3 | 0x10FF | Da 🗕 Ad | d Device | PLX51-PBS | PSFT10FF.GSD | - |
| 4 | 0x10FF | Do - | inge Station Address | PLX51-PBS | PSFT10FF.GSD | - |
| 5 | 0x10FF | Da | <u> </u> | PLX51-PBS | PSFT10FF.GSD | - |
| 6 | 0x10FF | Da ᡝ Up | oad Configuration | PLX51-PBS | PSFT10FF.GSD | - |
| 7 | 0x10FF | Da 🚺 Up | oad Configuration from All | PLX51-PBS | PSFT10FF.GSD | - |
| 8 | 0x10FF | Da 🗮 Dis | covery Report | PLX51-PBS | PSFT10FF.GSD | - |
| 9 | 0x10FF | Data Exch | ProSoft Technology, Inc. | PLX51-PBS | PSFT10FF.GSD | - |

Figure 3.39 – Selecting to upload the configuration from all Slaves.

| ral General | Statistics DPV1 Sta | tistics Live List Di | iscovered Nodes | Modbus Statistics | Ethernet Clients | TCP / ARP | | |
|-----------------------------|---------------------|----------------------|-----------------|------------------------------------|------------------|-----------|--------------|---------|
| Start Discovery Status Done | | | | | | | | |
| Station | Ident | Status | Ven | dor | Model | | GSD | Upload |
| 2 | 0x10FF | Data Exch | ProSoft Techr | ProSoft Technology, Inc. | | | PSFT10FF.GSD | Ok (24) |
| 3 | 0x10FF | Data Exch | ProSoft Techr | hology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |
| 4 | 0x10FF | Data Exch | ProSoft Techr | hology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |
| 5 | 0x10FF | Data Exch | ProSoft Techr | nology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |
| 6 | 0x10FF | Data Exch | ProSoft Techr | nology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |
| 7 | 0x10FF | Data Exch | ProSoft Techr | ProSoft Technology, Inc. PLX51-PBS | | | PSFT10FF.GSD | Ok (24) |
| 8 | 0x10FF | Data Exch | ProSoft Techr | nology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |
| 9 | 0x10FF | Data Exch | ProSoft Techr | nology, Inc. | PLX51-PBS | | PSFT10FF.GSD | Ok (24) |

Figure 3.40 – DPV0 Communication Configuration successfully uploaded.

3.7.3 Device Station Address Change

Certain devices can be set up to allow remotely changing of the station address. Devices with this option set generally defaults to station address 126. The user can change the station address of a device (if the device is correctly setup) by rightclicking on the device in the Discovery Lost and selecting *Change Station Address*.

| MyPLX51-PBM - Status | | | | | | | |
|------------------------|------------------------|-------------------------|----------------------|-----------------------|--------------|--------|--|
| General General Statis | tics DPV1 Statistics | Live List Discovered No | des Modbus Statistic | s Ethernet Clients TO | P / ARP | | |
| Start Discovery | Start Discovery Status | | Done | | | | |
| Station | Ident | Status | Vendor | Model | GSD | Upload | |
| 1 | 0x08A5 | | 010 | QTS-AN-X-PBx | qts_08a5.gse | | |
| 2 | 0x08A5 | Add Device |)g. | PLX51-PBM | PSFT10FE.GSD | | |
| 3 | 0x08A5 | Change Station Add | ress | QTS-AN-X-PBx | qts_08a5.gse | | |
| 4 | 0x08A5 | Upload Configuration | on | QTS-AN-X-PBx | qts_08a5.gse | • | |
| 5 | 0x08A5 | 🕇 Upload Configuratio | on from All | QTS-AN-X-PBx | qts_08a5.gse | | |
| 6 | 0x08A5 | Discovery Report | | QTS-AN-X-PBx | qts_08a5.gse | | |

Figure 3.41 – Changing Station Address

Next the user will need to select the new station address for the device. Once selected press the Set button.

| 🚸 Change Station Address | × |
|--------------------------|-------------|
| | |
| Old Station Address | 1 |
| Device Ident. | 0x08A5 |
| New Station Address | 18 🔻 🔲 Lock |
| | |
| Set | Cancel |
| | |

Figure 3.42 – Selecting new Station Address.

Once the request has been sent the user can either start a new network discovery to confirm the address has changed or monitor the Livelist (see the *Diagnostics* section).

NOTE: The amount of time for the device to appear at the new station address is device depended. In the Livelist there will be a period where both node addresses show up while the original station address is timing out.

IMPORTANT: If the user sets the station address to an address that is already present on the DP network it will result in communication failure of both devices.

IMPORTANT: Generally, the device will need to be in the correct state before it will accept a command to change its station address (i.e. must not be in data exchange state).

3.7.4 Discovery Report

This report summarizes the following device information found during discovery: Address, Identity Number, Status of configuration, Device name, GSD filename, and Upload Configuration status.

| MyPLX51-PBM - Status | | | | | | | | |
|--|---|--|---|---|---|--|---|--|
| General General Statistics DPV1 Statistics Live List Discovered Nodes Modbus Statistics Ethernet Clients TCP / ARP | | | | | | | | |
| Start Discovery |] Status | | | Done | | | | |
| Station | Ident | | Status | Vendor | | Model | GSD | Upload |
| 1 | 0x08A5 | | | 070 | | QTS-AN-X-PBx | qts_08a5.gse | |
| 2 | 0x08A5 | | | | PLX51-PBM | PSFT10FE.GSD | | |
| 3 | 0x08A5 | ç | Change Station A | ddress | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 4 | 0x08A5 | 1+ | Upload Configura | ition | | QTS-AN-X-PBx | qts_08a5.gse | |
| 5 | 0x08A5 | t ∙t | Upload Configura | tion from All | | QTS-AN-X-PBx | qts_08a5.gse | - |
| 6 | 0x08A5 | ₹ | Discovery Report | | | QTS-AN-X-PBx | qts_08a5.gse | |
| | eneral General Statist Start Discovery Station 1 2 3 4 5 | eneral General Statistics DPV1 Statistics Statt Discovery Status Station Ident 1 0x08A5 2 0x08A5 3 0x08A5 4 0x08A5 5 0x08A5 | eneral General Statistics DPV1 Statistics Live Start Discovery Status Station Ident 1 0x08A5 2 0x08A5 3 0x08A5 4 0x08A5 5 0x08A5 | Start Discoverv Status Station Ident Status 1 0x08A5 Add Device Change Station A 0x08A5 0x08A5 0x08A5 Upload Configura 5 0x08A5 Upload Configura 0x08A5 Upload Configura 0x08A5 Upload Configura 0x08A5 0x08A5 0x08A5 0x08A5 Upload Configura 0x08A5 0x08A5 | Start Discovery Statistics DPV1 Statistics Live List Discovered Nodes Modbus Statis Start Discovery Status Done Station Ident Status Vendor 1 0x08A5 Add Device Change Station Address 3 0x08A5 Modbus Statis Upload Configuration from All | Start Discovery Statistics Live List Discovered Nodes Modbus Statistics Start Discovery Status Done Station Ident Status Vendor 1 0x08A5 Add Device 3 0x08A5 Change Station Address 4 0x08A5 Vendor 5 0x08A5 Vendor | Start Discovery Status Done Start Discovery Status Done Station Ident Status Vendor Model 1 0x08A5 Add Device PL×51-PBM 3 0x08A5 Change Station Address QTS-AN-X-PBx 4 0x08A5 Vendor QTS-AN-X-PBx 5 0x08A5 Vendor Address QTS-AN-X-PBx | Start Discovery Status Done Start Discovery Status Done Station Ident Status Vendor Model GSD 1 0x08A5 Add Device QTS-ANX-PBx qts_08a5.gse 2 0x08A5 Change Station Address QTS-ANX-PBx qts_08a5.gse 4 0x08A5 Upload Configuration QTS-ANX-PBx qts_08a5.gse 5 0x08A5 Image: Station from All QTS-ANX-PBx qts_08a5.gse |

Figure 3.43 – Accessing the Discovery Report

| MyPLX51-PBM Device Discovery Report | | X |
|--|-----------|---|
| Profibus Device Discovery Report | | Â |
| Address: 001 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 002 Ident: 0x08A5 Ident Mismatch ProSoft Technology, Inc. PLX51-PBM PSF Uploaded Config: - | T10FE.GSD | |
| Address: 003 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 004 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 005 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 006 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 007 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 008 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | |
| Address: 009 Ident: 0x08A5 Unconfigured QTS QTS-AN-X-PBx qts_08a5.gse Uploaded Config: - | | - |
| | Þ | |

Figure 3.44 – Discovery Report

3.8 Adding PROFIBUS DP Devices – Master Mode

The user will need to add each PROFIBUS device to the PLX51-PBM which can then be configured. This is done by right-clicking on the *PROFIBUS Devices* item in the tree and selecting *Add PROFIBUS Device*.

ProSoft PLX50 Configuration Utility - <New Project>*

File Device Tools Window Help *1 🖬 🗎 👗 🗗 🗂 🕂 📳 🖾 🛠 Project Explorer **-** ₽ × In <New Project> MyPLX51-PBM (PLX51-PBM) Configuration 📥 Profibus Devi Add Profibus Device Paste Paste Special C Export Device List G Import Device List Set Watchdog (All) DP Packet Capture ø Global Control Ę Explicit Messaging

Figure 3.45 – Adding a PROFIBUS Field Device

The user will need to select the device to be added to the PLX51-PBM. This is done by selecting the device from the GSD File Selector and pressing *Ok*.

| Vendor | Model | Ident | Fil | ename | | | |
|---------------|---------------------------------|----------|-----------------|----------|--------|----------|----------|
| (All) | | | 0x* | * | Reset | | |
| Vendor | Model | Revision | GSD File | GSD Rev. | ldent. | Hardware | Software |
| Telemecanique | STB NDP 1010 | 1.0 | SA_063F.gsd | 2 | 0x063F | 1.0 | 1.01 |
| Telemecanique | STB NDP 2212 | 1.0 | SA_0640+(4_08)+ | 2 | 0x0640 | 1.0 | 4. |
| Telemecanique | STB NDP 2212 | 1.0 | SA_0640.gsd | 2 | 0x0640 | 1.0 | 4. |
| SCHLEICHER | RIO 8I/O DP | V.1.0 | SCHL0756.GSD | 1 | 0x0756 | 38 | 0 |
| SCHLEICHER | RIO 16I DP | V.1.0 | SCHL0758.GSD | 1 | 0x0758 | 38 | 0 |
| SCHLEICHER | RIO 160 DP | V.1.0 | SCHL075A.GSD | 1 | 0x075A | 38 | 0 |
| Telemecanique | XPSMC | 1.0 | SCHN0967.GSD | 3 | 0x0967 | 1.0 | 1.0 |
| SIEMENS AG | CPU 1510SP-1 PN | V1 | si0181C0.gsd | 5 | 0x81C0 | 1 | V1.7 |
| SIEMENS AG | CPU 1510SP F-1 PN | V1 | si0181C1.gsd | 5 | 0x81C1 | 1 | V1.7 |
| SIEMENS AG | CPU 1512SP-1 PN | V1 | si0181C2.gsd | 5 | 0x81C2 | 1 | V1.7 |
| SIEMENS AG | CPU 1512SP F-1 PN | V1 | si0181C3.gsd | 5 | 0x81C3 | 1 | V1.7 |
| SIEMENS | ET 200M (IM153-2) DPV1, H, 12IO | V1.5 | si04801e.gsd | 5 | 0x801E | 1 | V5.0.9 |
| SIEMENS | ET 200S (IM151) DPV1 | V1.4 | si04806a.gsd | | 0x806A | A1.0 | Z1.0 |
| Siemens AG | SINAMICS S120/S150 V4.5 | V4.5 | SI2680E5.GSE | 5 | 0x80E5 | С | V4.5 |
| Siomono AC | SINIAMICS \$120/\$150 \/4 \$ | V/4 9 | ai2080a5 and | 5 | 0-2055 | U | 1/4.9 |

Figure 3.46 – Selecting a PROFIBUS Field Device

Once the device has been added the General Configuration page will be opened and the device will be added at the first open PROFIBUS Station Address.

| ProSoft PLX50 Configuration Utility - PLX5 | 1_PBM_Testing* |
|---|---|
| File Device Tools Window Help Total Laboratory Project Explorer PX51-PBM_Testing PVX51-PBM(PLX51-PBM) | WyPLX51-PBM - 2 - Device Configuration |
| Configuration Configuration Profibus Devices (002) ET200MIM1532DPV1 | General Profibus Configuration DPV1 User Parameters Slot Configuration Start-up Parameters DPV1 Objects DPV1 Alarms Instance Instance Name ET200MIM1532DPV1 Et200MIM1532DPV1 Device Details GSD File si04801e.gsd Vendor SIEMENIS |
| | Model ET 200M (IM153-2) DPV1, H, 12IO Identity 0x0801E Revision 5 |

Figure 3.47 – PROFIBUS Field Device Added

3.8.1 General

The General configuration is shown in the figure below. The Device General configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| W1 User Parameters | | | | |
|---------------------------------|--------------------|-----------------------|--------------|-------------|
| VI OSCIT atameters | Slot Configuration | n Start-up Parameters | DPV1 Objects | DPV1 Alarms |
| | | | | |
| 11532DPV1 | | | | |
| | | | | |
| gsd | | | | |
| | | | | |
| ET 200M (IM153-2) DPV1, H, 12IO | | | | |
| | _ | | | |
| | | Revision 5 | Revision 5 | Revision 5 |

Figure 3.48 – Field Device General configuration parameters

The General configuration consists of the following parameters:

| Parameter | Description |
|---------------|---|
| Instance Name | The device instance name which will be used to create the Tag |
| | names and UDTs in Logix. |

 Table 3.11 – Device General configuration parameters

3.8.2 **PROFIBUS** Configuration

The PROFIBUS configuration is shown in the figure below. The Device PROFIBUS configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| General Profibus Configuration Node Address 2 TSDR 11 (bits) Minimum Slave Interval 6 (x100 us) Watchdog 6 (x100 us) Watchdog Enable Value 500 (ms) Profibus Data Options Byte/Word Swap Option None Force Data to Zero on Communication Failure | neral Profibus Configuration | DPV1 | User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms |
|---|--------------------------------|-------|-----------------|--------------------|---------------------|-----------------|--------------|
| TSDR 11 (tbits) Minimum Slave Interval 6 (x 100 us) Watchdog Freeze / Sync Watchdog Enable Value Year of the state of the sta | General Profibus Configuration | | | | | | |
| ISDR II (tbits) | Node Address 2 | | \sim | G | roup Membership | | |
| Watchdog Freeze / Sync Watchdog Enable Value 500 (ms) Freeze Enabled Sync. Enabled | TSDR 11 | | (tbits) | | | | |
| Watchdog Enable Value 500 (ms) Freeze Enabled Sync. Enabled | Minimum Slave Interval 6 | | (x100 us) | | | | |
| Profibus Data Options | Watchdog | | | Fr | reeze / Sync | | |
| | Watchdog Enable | Value | 500 (ms) | | Freeze Enabled | Sync. Enal | bled |
| Byte/Word Swap Option None | Profibus Data Options | | | | | | |
| | Byte/Word Swap Option | Nor | e | \sim | Force Data to Zer | o on Communicat | tion Failure |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Figure 3.49 – Field Device PROFIBUS configuration parameters

The PROFIBUS configuration consists of the following parameters:

| Table 3.12 | Field Device PROFIBUS configuration parameters |
|------------------------|---|
| Parameter | Description |
| Node Address | This is the station address configured for the added device. This is the address the PLX51-PBM will use to look for and configure the device for Data Exchange. |
| TSDR | This parameter is the minimum time that a PROFIBUS-DP slave must wait before it responds. It must respect the rule: Min: 11 Max: 1023 Default: 11 |
| Minimum Slave Interval | This is the minimal time that the PROFIBUS must wait between two IO data exchanges with this device. The default value proposed comes from the GSD File. Min: 1 Max: 65535 |
| Watchdog Enable | Enables the watchdog for the slave device data exchange. The slave device monitors the data exchange rate (PROFIBUS Cycle) and it must be less than the Watchdog Value else the slave device will change back into an unconfigured state. |
| Watchdog Value | Is used to monitor cyclic communication and must be significantly higher than the time required for one PROFIBUS cycle. If a slave does not receive a request frame for a period of time longer than the watchdog time, it will revert to its initial, power-up state and cyclic communication will have to be reestablished. |

| | The minimum and default values are defined by the PLX51-PBM Default Watchdog setting in the PLX51-PBM PROFIBUS configuration. | | | | | |
|--|--|--|--|--|--|--|
| Group Membership | Specifies which groups the slave belongs to. A slave can be in multiple groups at a time (from 1 through 8). Groups are used by the master when it sends a Sync or Freeze command. PROFIBUS Group checkboxes are enabled when Sync Mode or Freeze Mode checkboxes are checked. | | | | | |
| Freeze Enabled | User data transmission Synchronization control commands enable the synchronization of inputs. Freeze Mode field is unchecked by default | | | | | |
| Sync Enabled | User data transmission Synchronization control commands enable the synchronization of outputs. Sync Mode is unchecked by default. | | | | | |
| Byte/Word Swap Option | This parameter will reformat the input and output Profibus DPV0 communication data. Below are the reformat options if the normal data format is AA BB CC DD: None BB AA DD CC BB AA CC DD AA BB | | | | | |
| Force Data to Zero on Communication Failure | When this parameter is set it will force the last data received from a DP device to be forced to zero if the DPV0 communication to that specific device is lost. | | | | | |

3.8.3 DPV1

The DPV1 configuration is shown in the figure below. The slave device DPV1 configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting Configuration.

| seneral | Prolibus Conliguratio | | User Parameters | SlotConfiguration | Start-up Parameters | DPVIObjects | DPVI Alarm |
|---------|-----------------------|-----------|-----------------|-------------------|---------------------|--------------|------------|
| DPV1 | Settings | | | | | | |
| | | | | | Alarm Enable | s | |
| | Enable DPV1 | | | | Pull Plug | a Alarm | |
| | Base 1ms | | | | Process | Alorm | |
| | Enable Fail Safe | | | | Process | AldIII | |
| | | | | | Diagnos | tic Alarm | |
| | Check Config | | | | Manufac | cturer Alarm | |
| AI | arm Mode | 1 of each | ~ | | Status A | larm | |
| |] Alarm Ack uses SA | AP50 | | | Update | Alarm | |
| | _ | | | | | | |

Figure 3.50 – Device DPV1 configuration parameters

The DPV1 configuration consists of the following parameters:

| | Table 3.13 – Device DPV1 configuration parameters |
|------------------|---|
| Parameter | Description |
| Enable DPV1 | Indicates if the slave supports DPV1 Class 1 access (read and write) or alarms. If the device does not support these DPV1 services, this parameter must be unchecked. The default value is based on the information provided by the GSD File. |
| Base 1ms | Indicates if the device should use the 1ms base time for watchdog time calculation. See the chapter "PROFIBUS Settings" below for watchdog time calculation. By default, the field will be unchecked which sets the watchdog base to 10 ms. |
| | NOTE: the watchdog value is always shown in the configuration panel in ms regardless of this time base setting. |
| Enable Fail Safe | The failsafe mode determines the behavior of the DP Slave outputs when the PROFIBUS Master is in CLEAR state: |
| | If the slave is configured to be failsafe and supports this feature, then it will apply its own fallback value (the Master sends outputs with 0 length data) If not, the Master sends output data at 0 |
| | If this feature is supported by the device, the check box must be checked. If the device does not support it, this parameter must be unchecked. The default value is based on the information provided by the GSD File. |
| Check Config | This checkbox is used to define the reaction to the reception of configuration data. If the check box is not set, the check is as described in EN 50170. If the check box is set, the check is made according to a specific user definition. By default, the field will be unchecked. |
| Alarm Mode | This parameter specifies the maximum number of possible active alarms for the device. |

| Alarm Ack uses SAP50 | This will force the PLX51-PBM to use Service Access Point (SAP) 50 to acknowledge alarms. |
|----------------------|---|
| Alarm Enables | Enables specific alarms for the slave device to report on if active. The available alarms are listed below and are only available if specified in the device's GSD file: Pull Plug Alarm Process Alarm Diagnostic Alarm Manufacturer Alarm Status Alarm Update Alarm |

3.8.4 User Parameters

The User Parameter configuration is shown in the figure below. The device User Parameter configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| WyPLX51-PBM - 2 - Device Configuration | | |
|--|--|----------|
| General Profibus Configuration DPV1 User Parameters Slot C | configuration Start-up Parameters DPV1 Objects DPV | 1 Alarms |
| | 5 | |
| Ext User Parameters | | |
| Parameter | Value | Notes |
| Identifier-related diagnostics | enable | ~ |
| Submodule status | enable | ~ |
| Channel-related diagnostics | enable | ~ |
| Analog-value format | SIMATIC S7 | ~ |
| Unbundled H-KIR | disable | \sim |
| MLFB | 6ES7 153-2BA02-0XB0 | \sim |
| | | |
| User Parameter Data 80 00 08 09 81 00 00 82 00 00 80 02 | | Default |
| | Ok Apply Can | cel |

Figure 3.51 – Device User Parameter configuration parameters

The User Parameter configuration consists of the device specific user configuration. This is extracted from the device GSD file and can be used to configure device specific parameters. When one of the parameters is changed the User Parameter Data will be updated which is sent to the device in the Set Parameter telegram.

3.8.5 Slot Configuration

Each slave device can have multiple slots that can be configured. A slot can be a place holder for a process variable or a placeholder for a specific piece of hardware. In the example below the PROFIBUS slave device added is an IO adapter which can have multiple additional IO modules which will be represented as additional slots.

| 1 |
|---|
| Add Module |
| Data Point Data Type Byte Length DP Offset Ext User |
| |
| |
| |

Figure 3.52 - Field Device Slot configuration start

To add a module, select the *Add Module* button. The module selection form will appear listing all the available modules from the GSD file.

| Module | Description * | Reset |
|--------|--------------------------------|---|
| ID 🔺 | Description | Info |
| 131 | 6ES7 332-5HB81-0AB0 2AO | Analog output module AO2/12bits, reconfigurable online, extended environ |
| 132 | 6ES7 334-0KE80-0AB0 4AI/2AO | Analog input/output module. Al4/12bits+AO2/12bits, extended environment |
| 133 | 6ES7 338-4BC01-0AB0 POS-INPUT | Position detection module POS-INPUT, supports clocking |
| 134 | 6GK7 342-2AH01-0XA0 CP342-2 | Basic module for connecting PLC-i |
| 137 | 6ES7 322-1CF00-0AA0 8DO | Digital input module DO8 48-125V DC/1.5A, grouping 4 |
| 138 | 6ES7 327-1BH00-0AB0 8DI/8DX | Digital I/O module DI8 24V / DX8 individually configurable channels as DI/D |
| 139 | 6ES7 331-7HF01-0AB0 8AI | Analog input Al8x14Bit, High Speed (tdp min = 1ms), supports clocking |
| 140 | 6ES7 338-7XF00-0AB0 IQ-Opto | Module 8 IQ-SENSE for the connection of IQ-SENSE devices |
| 141 | 6ES7 338-7XF00_IQ-ID1/128/129A | Module 8 IQ-SENSE for the connection of IQ-SENSE devices, mixed config |
| 142 | 6ES7 322-8BH01-0AB0 16DO_24V | Digital output module DO 16xDC24V/0.5A, with diagnostics, reconfigurable |
| 143 | 6ES7 332-7ND02-0AB0 4AO | Analog output module 4AO/16bits, supports clocking |
| 144 | 6ES7 331-7PF01-0AB0 RTD | Analog input module Al8xRTD, 16bits (internal 24bits according to Sigma D |

Figure 3.53 – Module Selection

The *Module Description* filter can be used in conjunction with the wildcard character ("*") to easily locate the required module. Once the required module has been selected press the *Ok* button.

The module will be added to the Slot configuration. The layout of the slot configuration differs slightly depending on whether Logix or Modbus has been selected as the Primary Interface.

| eral Profibu | s Configuration DPV1 User Parame | ters Slot Configuration Star | t-up Parameters DPV1 Objects D | PV1 A | larms | 5 | | | | | | | |
|---------------|--------------------------------------|------------------------------|--------------------------------|-------|-------|---|---------|-----|----------|----|-------------|-------------|------------------|
| lot Configure | tion | | | | | | | | | | | [| Add Module |
| | | | | | | | Data Da | int | Data Typ | | Byte | DP | Ext User |
| Slot | Description | | Module | | | | Data Po | m | | e. | Length | Offset | Prm |
| | Description 271BH000AB | 138-6ES7 327-1BH00-0 | | | + | 1 | Input | ~ | INT | | Length 2 | Offset 0 | Prm 155F01001 |



| neral | Profibus Configuration DPV1 | User Parameters Slot Configura | tion Start-up | o Para | imete | ers C | OPV1 Object | DPV1 Alarm | s | | | | | |
|--------|-----------------------------|-----------------------------------|---------------|--------|-------|-------|-------------|------------|---|----------------|------------------|------------------|--------------|-------------------------------|
| Slot (| | | | | | | | | | | | | | |
| | Configuration | | | | | | | | | | | | | Add Module |
| Slot | Description | Module | | | | | Data Point | Data Type | 1 | Byte Length | Register Type | lodbus Offset | DP Offset | Add Module Ext User Prm |
| Slot | | Module 138-6ES7 327-1BH00-0AB0 | 8DI/8DX | | + | | Data Point | Data Type | ~ | | Туре | | | Ext User |

Figure 3.55 – Slot configuration – (Modbus)

Slot Configuration - General

Each module added can consist of one or more Data Points. In the example below the module has two Data Points, one Input and one Output.

The description of each is based on the module name (from GSD file) but can be edited by the user. When using Logix this Description is used to create the member of the device-specific UDTs and thus no illegal Logix characters are permitted. It is also important that these descriptions are unique within a device.

| 🄅 Myl | PLX5 | 1-PBM - 2 - Device Configuration | | | | | | | | | | | | | _ | |
|-------|-------|---|---------------------------------|-------------------|--------------|-----|----------|-----|---------|---------------|----------|-------|------|--------------|-----------------|-----------|
| Gene | eral | Profibus Configuration DPV1 User Paramete | rs Slot Configuration St | art-up Parameters | DPV1 Objects | DPV | 1 Ala | rms | | | | | | | | |
| SI | ot Co | onfiguration | | | | | | | | | | | | | Add Module | |
| s | Slot | Description | | Module | | | | | Data Po | int | Data Typ | e | Byte | DP Offset | Ext User Prm | |
| | 1 [| DigitalInputs | 138-6ES7 327-1BH00-0AB0 8DI/8DX | | | | . | + | | Input | | INT Y | | Length 2 | 0 0 | 155F01001 |
| | ٥ | DigitalOutputs | | | | | + | X | Output | $\overline{}$ | INT | ~ | 2 | 0 | | |
| | | | | | | | | | | | | | | | | |

Figure 3.56 - Slot descriptions

Some modules provide module specific User Parameters to further configure the module. These parameters can be accessed by either clicking on the Configure (...) button or by right-clicking on the Module and selecting the **Configure Module** option in the context menu.

Slot Configuration Slot Module Description DigitalInputs 80 8DI/8DX Insert Module ÷ DigitalOutputs **Configure Module** Ö Delete Module × Add Data Point Delete Data Point ו

Figure 3.57 – Access Module Specific User Parameters

The Module User Parameter Editor will appear. The parameters and their enumerated options are derived from the GSD file.

| | Parameter | Value | | Notes |
|---|---|-----------|---|---------|
| | [SlotNumber] | 1 | | 1-15 |
| | Use channel 8 as output | No | ~ | |
| | Use channel 9 as output | No | ~ | |
| | Use channel 10 as output | No | ~ | |
| | Use channel 11 as output | Yes | ~ | |
| Þ | Use channel 12 as output | No | ~ | |
| | Use channel 13 as output | No Yes | | |
| | Use channel 14 as output | | v | |
| | Use channel 15 as output | No | ~ | |
| _ | | | | |
| | 5F 01 00 10 00 00 00 00 00 00 00 00 00 00 | | | Default |

Figure 3.58 – Device Slot configuration additional parameters

Once the slot parameters have been updated the user can click the **OK** button which will update the Extended User Parameters and return to the Slot Configuration page.

When adding a slot, the data format and size will default to that of the selected module in the GSD file. Depending on the GSD file, the default configuration may not be preferred and can be changed by the user.

Formatting the modules data can be achieved by a combination of adding or removing Data Points and changing the Data Type of each.

Data Points can be added by either right-clicking on the module and selecting *Add Data Point* or by clicking on the "+" button.

Data Points can be removed by either right-clicking on the module and selecting **Delete Data Point** or by clicking on the "**X**" button.

| Slot | Description | Мо | dule | | |
|------|---------------------------------|----------------------|--|---|---|
| 1 | DigitalInputs DigitalOutputs | 138-6ES7 327-1BH00-0 | Insert Module Configure Module Delete Module | + |) |
| | | +• | Add Data Point | | |
| | | * | Delete Data Point | | |

Figure 3.59 - Adding / Removing Data Points

NOTE: Each module must contain at least one Data Point.

Slot Configuration

After adding a new Data Point, the following should be configured:

- Description
- Data Point Type (Input, Output, None)
- Data Type
- Byte Length

Slot Configuration

| Slot | Description | Module | | | Data Poir | nt | Data Type | e | Byte Length | DP Offset |
|------|----------------|---------------------------------|-------|---|-----------|----|-----------|---|----------------|--------------|
| 1 | DigitalInputs | 138-6ES7 327-1BH00-0AB0 8DI/8DX | + | | Input | ~ | SINT | ~ | 1 | 0 |
| | DigitalInputs2 | | + | X | Input | ~ | SINT | ~ | 1 | 1 |
| | DigitalOutputs | | + | X | Output | ~ | INT | ~ | 2 | 0 |

| Figure 3.60 - | Configuring | Data | Dointe |
|---------------|-------------|------|--------|
| Figure 3.60 – | Configuring | Dala | FOINS |

After updating the Data Type, the Byte Length will be set to match the selected Data Type. By modifying the Byte Length thereafter, an array of that Data Type can be configured. It is however important that the Byte Length is always a multiple of the base Data Length.

| Data Type | Byte Length MUST be a multiple of: |
|-----------|------------------------------------|
| BOOL | 1 |
| SINT | 1 |
| INT | 2 |
| DINT | 4 |
| REAL | 4 |

Table 3.14 – Data Type – Byte Length Restrictions

IMPORTANT: It is critical that the configured Byte Length be a multiple of the base Data Type.

IMPORTANT: It is critical that the total sum of input and output bytes (of all the Data Points) match that required by the slave device. Not adhering to this could cause unexpected results.

NOTE: The DP (Byte) Offset for each the Data Point will be automatically calculated.

Slot Configuration – Logix Specific

When using Logix as the Primary Interface, the PROFIBUS Data Points will be packed and padded to match a device specific UDT. All the Inputs will be collated together and then all the Outputs.

IMPORTANT: It is important that the Data Point Descriptions do not contain any illegal characters and are not duplicated within a device. Failing to do so will create errors when generating and importing the mapping L5X into Studio 5000.

| Slot C | Configuration | | | | | | | | | | | |
|--------|----------------|---------------------------------|--|---|---|---------|-----|----------|--------|----------------|--------------|-----------------|
| Slot | Description | Module | | | | Data Po | int | Data Typ | e | Byte Length | DP Offset | Ext User Prm |
| 1 | DigitalInputs | 138-6ES7 327-1BH00-0AB0 8DI/8DX | | + | | Input | ~ | INT | \sim | 2 | 0 | 155F01001 |
| | DigitalOutputs | | | + | Х | Output | ~ | INT | \sim | 2 | 0 | |

Figure 3.61 – Slot configuration – Logix Example

Slot Configuration – Modbus Specific

Slot Configuration

When using Modbus as the Primary Interface, it is important to configure the Modbus Register Type and Modbus Offset correctly to ensure that multiple Data Points are not mapped to the same Modbus data area.

| Slot | Description | Module | | | | Data Po | int | Data Typ | е | Byte Length | Registe Type | er | Modbus Offset | DP Offset | Ext User Prm |
|------|----------------|-------------------------|---------|-------|---|---------|--------|----------|---|----------------|-----------------|----|------------------|--------------|-----------------|
| 1 | DigitalInputs | 138-6ES7 327-1BH00-0AB0 | 8DI/8DX | + | | Input | \sim | INT | ~ | 2 | HR | ~ | 2000 | 0 | 155F01001 |
| | DigitalOutputs | | | + | X | Output | \sim | INT | ~ | 2 | HR | ~ | 2001 | 0 | |

Figure 3.62 – Slot configuration – Modbus Example

IMPORTANT: It is important that the Data Point Register Type and Modbus Offset does not result in multiple Data Points overlapping. Such conflicts will cause unexpected results.

IMPORTANT: It is important that the Data Point Register Type is appropriate for the Data Type, Type (Input/Output) and Modbus interface type (Master/Slave).

IMPORTANT: The range of configured Modbus registers for each register type may not exceed 10,000.

To simplify the Modbus register assignment process, the user can select the **Assign Modbus from Here** option, after right-clicking on a particular mapped item. Once the assignment process is complete, all the mapped items below, and including, the selected item will be updated.

| Slot | Description | | | Module | | | |
|------|------------------|------|--------|-------------------------|-----|---|---|
| 1 | MainProcessValue | 01-1 | | Insert Module | | + | |
| | MainProcessValu1 | | T | indere module | - [| + | X |
| | MainProcessVa3 | | \$ | Configure Module | - 1 | + | |
| | MainProcessVal5 | | × | Delete Module | t | + |) |
| 2 | a2ndCyclicValue | 02-2 | 1 | Move Module Up | Ē | + | |
| | a2ndCyclicValueS | | Ŧ | Move Module Down | | + | |
| 3 | DisplayValue | 03-0 | +• | Add Data Point | | + | |
| | DisplayValueStat | | × | Delete Data Point | | + | X |
| | | | _= | Assign Modbus from Here | 1 | | |

Figure 3.63 – Slot configuration – Selecting Assign Modbus from Here option

After selecting this option, the *Modbus Assignment* form will open.

| 🚸 Modbus A | ssignment | | | | x |
|------------|-----------|----------------|---------------|------|---|
| Modbus O | ffsets | | Modbus Reads | | |
| IR | 0 | Next Available | Register Type | IR ¥ | |
| HR | 256 | | Discrete Type | IS 🗸 | |
| IS | 0 | | | | |
| cs | 608 | | | | |
| | | Ol | Canaal | | |
| | | Ok | Cancel | | |

Figure 3.64 – Modbus Assignment

The *Modbus Offsets* for each Modbus data type will default to the next available register after the last one referenced. These offsets will be used as the starting registers for the auto-assignment, and can be modified by the user as required.

The Next Available button, will return the offsets to their default values.

The automatic assignment of registers will take into account the data type of each data point. In the case of Modbus reads, the assigned type could be either an Input Register (IR) or Holding Register (HR) for non-Booleans and either a Digital Input (IS) or Coil (CS) for Booleans.

The user can specify their preference using the **Register Type** and **Discrete Type** combo box options in the **Modbus Reads** section.

Once the *Ok* button has been clicked, the Modbus *Register Type* and *Modbus Offset* for the selected, and subsequent items, will be updated.

3.8.6 Start-up Parameters

Each slave device can have a set of start-up parameters associated with it which will be updated once Data Exchange is active using DPV1 Class 1 messaging. Thus, the user can have specific parameters that must be updated after the device is initialized for data exchange which will simplify device replacement.

| MyPLX5 | 51-PBM - | 2 - Device C | Configu | ration | | | | | |
|--------|-----------|-----------------|---------------------|---------------------|--|---|--|--|--|
| eneral | Profibus | Configuration | DPV1 | User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms | |
| Start | -Up Parai | neters | | | | | | | |
| | Enable | Start-up Para | ameters | ; | | | | | |
| | | | Descrip | tion | Slot | Index | Data Type | Va | alue |
| | • | | | | | | | \sim | |
| | | | | | | | | | |
| | | | | | | | | | |
| | ieneral | eneral Profibus | Start-Up Parameters | Start-Up Parameters | Start-Up Parameters Enable Start-up Parameters Description | ieneral Profibus Configuration DPV1 User Parameters Start-Up Parameters | Beneral Profibus Configuration DPV1 User Parameters Stot Configuration Start-up Parameters Start-Up Parameters | Index Description Slot Index Data Type | Start-Up Parameters DPV1 User Parameters Slot Configuration Start-up Parameters DPV1 Objects DPV1 Alarms Start-Up Parameters |

Figure 3.65 – Device Start-up Parameters

The user will need to enable the Start-up parameters by selecting the *Enable Start-Up Parameters* checkbox. Then the user will need to enter the required start-up parameters as shown below.

| art-Up Pa | arameters | | | | | |
|-----------|-------------------------|------|-------|-----------|--------|-------|
| 🗸 Ena | ble Start-up Parameters | | | | | |
| | | | | | | |
| | Description | Slot | Index | Data Type | | Value |
| | Damping Factor | 1 | 4 | Real | \sim | 5.25 |
| | | | | | × 1 | |

Figure 3.66 – Device Start-up Parameters Example

Once the slave device has been successfully parameterized and configured for Data Exchange the PLX51-PBM will update one parameter at a time for each slave device.

3.9 Adding PROFIBUS DP Devices – Slave Mode

The user will need to add each PROFIBUS device to the PLX51-PBM, which can then be configured. This is done by right-clicking on the **PROFIBUS Devices** item in the tree and selecting **Add PROFIBUS Device**.

| 🔅 ProSoft PLX50 Configur | atio | on Utility - <new project="">*</new> |
|---|---------|--------------------------------------|
| File Device Tools | | |
| : <u></u> , , , , , , , , , , , , , , , , , , , | | |
| Project Explorer | 000000 | - 7 × |
| . Sew Project> | יוס | |
| MyPLX51-PBM (| FU | |
| Profibus Device | | |
| • | ÷. | Add Profibus Device |
| | Ĵ | Paste |
| | ĉ | Paste Special |
| | ð | Export Device List |
| | G, | Import Device List |
| S | D WD | Set Watchdog (All) |
| | λ. | DP Packet Capture |
| | ø | Global Control |
| | Ŧ | Explicit Messaging |
| | _ | |
| | | |

Figure 3.67 – Adding a PROFIBUS Field Device

When adding a PROFIBUS Device in Slave Mode, the user can select any of the following devices to add:

| The section Interview Contract | × |
|--|---|
| GSD File | |
| Standard (PSFT10FE.GSD) | |
| C Legacy - ProLinx (PGWA05A5.GSD) | |
| Ok Cancel | |

Figure 3.68 – Selecting a PROFIBUS Field Device

Table 3.15 – Slave GSD Files

| Module | GSD Filename |
|-----------|--------------|
| PLX51-PBM | PSFT10FE.GSD |
| ProLinx | PGWA05A5.GSD |

3.9.1 General

The General configuration is shown in the figure below. The Device General configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| 🔅 PLX51-PBM S | ave - 2 - Device Config | uration | | | | | | |
|----------------|-------------------------|-----------------|--------------------|---------------------|--------------|-------------|--|--|
| General Profib | us Configuration DPV1 | User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms | | |
| Instance | | | | | | | | |
| Instance N | ame PLX51PBM | | | | | | | |
| | | | | | | | | |
| Device Deta | ls | | | | | | | |
| GSD File | PSFT10FE.GSD | | | | | | | |
| Vendor | ProSoft Technolog | gy, Inc. | | | | | | |
| Model | PLX51-PBM | | | | | | | |
| Identity | 0x010FE | Revision 5 | | | | | | |
| | | | | | | | | |

Figure 3.69 – Device General configuration parameters

When the module is emulating the legacy device, the PLX51-PBM General configuration parameters will appear as follows:

| MyPLX51-PBM - 4 | | figuration PV1 User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms | |
|----------------------------|--------------|--------------------------------|--------------------|---------------------|--------------|-------------|--|
| Instance Instance Name | ProLinxProfi | | | | - | | |
| Device Details GSD File | PGWA05A5 | i.gsd | | | | | |
| Vendor | ProLinx Com | nm Gateways Inc. | | | | | |
| Model | ProLinx Prof | ibus Slave | | | | | |
| Identity | 0x005A5 | Revision 2 | | | | | |
| | | | | | | | |
| | | | | | | | |

Figure 3.70 – Device General configuration parameters (legacy device)

The General configuration consists of the following parameters:

Table 3.16 – Device General configuration parameters

| Parameter | Description |
|---------------|--|
| Instance Name | The device instance name which will be used to create the Tag names and UDTs in Logix. |

3.9.2 PROFIBUS Configuration

The PROFIBUS configuration is shown in the figure below. The Device PROFIBUS configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| | DPV1 | User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms |
|------------------------------|--------|-----------------|--------------------|------------------------|----------------|---------------|
| General Profibus Configurati | on | | | | | |
| Node Address | 2 | \sim | G | roup Membership | | |
| TSDR | 11 | (tbits) | | □ 1 □ 2 □ □ 5 □ 6 □ | | |
| Minimum Slave Interval | 6 | (x100 us) | | | | |
| Watchdog | | | Fr | eeze / Sync | | |
| Watchdog Enable | Value | 500 (ms) | | Freeze Enabled | Sync. Ena | abled |
| Profibus Data Options | | | | | | |
| Byte/Word Swap Opti | on Non | e | \sim | Force Data to Zer | o on Communica | ation Failure |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Figure 3.71 – Device PROFIBUS configuration parameters

When the module is emulating the legacy device, the PLX51-PBM Profibus Configuration parameters will appear as follows:

| | rofibus Configura | | | | Start-up Parameters | - | |
|--------|-----------------------------------|-------|---------|---|---------------------|------------------|--------------|
| Node A | ddress | 4 | ~ | G | roup Membership | | |
| TSDR | n Slave Interval | 11 | (tbits) | | |]3 🗌 4]7 🗌 8 | |
| Wato | ndog Vatchdog Enable | Value | 20 (ms) | | eeze / Sync | Sync. Ena | bled |
| | us Data Options e/Word Swap Op | | e | ~ | Force Data to Zer | ro on Communica | tion Failure |
| | | | | | | | |
| | | | | | | | |

Figure 3.72 – Device PROFIBUS configuration parameters (legacy device)

The PROFIBUS configuration consists of the following parameters:

| Parameter | Description |
|------------------------|---|
| Node Address | This is the station address configured for the added device. This is the address the DP PROFIBUS Master will use to look for and configure the device for Data Exchange. |
| TSDR | N/A |
| Minimum Slave Interval | N/A |
| Watchdog Enable | N/A |
| Watchdog Value | N/A |
| Group Membership | N/A |
| Byte/Word Swap Option | This parameter will reformat the input and output Profibus DPV0 communication data. Below are the reformat options if the normal data format is AA BB CC DD: None BB AA |
| | DD CC BB AA |
| | CC DD AA BB |

3.9.3 DPV1

The DPV1 configuration is shown in the figure below. The slave device DPV1 configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| General Profibus Configuration DPV1 User Par | rameters Slot Configuratio | n Start-up Parameters | DPV1 Objects | DPV1 Alarr |
|--|----------------------------|-----------------------|--------------|------------|
| DPV1 Settings | | | | |
| Enable DPV1 | | Alarm Enable | | |
| Base 1ms | | Process | Alarm | |
| Enable Fail Safe | | Diagnos | stic Alarm | |
| Check Config | | Manufa | cturer Alarm | |
| Alarm Mode 1 of each \vee | | Status A | larm | |
| Alarm Ack uses SAP50 | | Update | Alarm | |
| | | | | |

Figure 3.73 – Device DPV1 configuration parameters

When the module is emulating the legacy device, the PLX51-PBM DPV1 configuration parameters will appear as follows:

| ieneral | Profibus Configuration | DPV1 User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms |
|---------|------------------------|----------------------|--------------------|---------------------|--------------|-------------|
| DPV1 | Settings | | | Alarm Enables | | |
| | Enable DPV1 | | | Pull Plug Alarm | | |
| | Base 1ms | | | Process Alarm | | |
| | Enable Fail Safe | | | Diagnostic Alam | n | |
| | Check Config | | | Manufacturer A | lam | |
| A | arm Mode 1 of | each 🗸 | | Status Alarm | | |
| | Alarm Ack uses SAP5 | i0 | | Update Alarm | | |
| | | | | | | |

Figure 3.74 – Device DPV1 configuration parameters (legacy device)

| The DPV1 | configuration | consists | of the | following | parameters: |
|----------|---------------|----------|--------|-----------|-------------|
| | | | | | |

Table 3.18 – Device DPV1 configuration parameters

| Parameter | Description |
|----------------------|---|
| Enable DPV1 | Enables DPV1 capabilities for the PLX51-PBM in Slave Mode. |
| | Note: DPV1 capabilities are not available when the module is emulating the legacy device. |
| Base 1ms | N/A |
| Enable Fail Safe | N/A |
| Check Config | N/A |
| Alarm Mode | N/A |
| Alarm Ack uses SAP50 | This will force the PROFIBUS DP Master to use Service Access Point (SAP) 50 to acknowledge alarms. |
| Alarm Enables | N/A |

3.9.4 User Parameters

Note: You must configure the slave device's user parameters in the settings of the PROFIBUS DP Master.

The User Parameter configuration is shown in the figure below. The device User Parameter configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| Pa | arameter | Value | | | Notes |
|--------------------|----------|-------|--|-----|-------|
| SPC3 User Prm Byte | | 0 | | 0-7 | |
| | | - | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Figure 3.75 – Device User Parameter configuration parameters (legacy device)

3.9.5 Slot Configuration

Each slave device can have multiple slots that can be configured. A slot can be a place holder for a process variable or a placeholder for a specific piece of hardware. In the example below the PROFIBUS slave device added is an IO adapter which can have multiple additional IO modules which will be represented as additional slots.

| 🔅 MyF | PLX5 | 61-PBM - 2 - Device C | onfigura | ition | | | | | | | | |
|-------|------|------------------------|----------|-----------------|--------------------|-------------|-----------|--------------|-------------|----------------|-----------|--------------|
| Gene | ral | Profibus Configuration | DPV1 | User Parameters | Slot Configuration | Start-up Pa | arameters | DPV1 Objects | DPV1 Alarms | | | |
| Slo | t Co | nfiguration | | | | | | | | | | Add Module |
| 5 | Slot | Description | | | Module | | | Data Point | Data Type | Byte Length | DP Offset | Ext User Prm |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Figure 3.76 – Field Device Slot configuration start

To add a module, select the *Add Module* button. The module selection form will appear listing all the available modules from the GSD file.

| ID | Description | Info |
|-----|------------------|------------------|
| 001 | Input: 1 Byte | Input: 1 Byte |
| 002 | Input: 2 Bytes | Input: 2 Bytes |
| 003 | Input: 4 Bytes | Input: 4 Bytes |
| 004 | Input: 8 Bytes | Input: 8 Bytes |
| 005 | Input: 16 Bytes | Input: 16 Bytes |
| 006 | Output: 1 Byte | Output: 1 Byte |
| 007 | Output: 2 Bytes | Output: 2 Bytes |
| 008 | Output: 4 Bytes | Output: 4 Bytes |
| 009 | Output: 8 Bytes | Output: 8 Bytes |
| 010 | Output: 16 Bytes | Output: 16 Bytes |

Figure 3.77 – Module Selection for the PLX51-PBM slave device selected

Note: Note: You must configure the slave device's user parameters in the settings of the PROFIBUS DP Master:

| Module Descri | ption • | Reset |
|---------------|-----------------|-------|
| ID | Description | Info |
| 001 | Empty Slot | |
| 002 | 1 Word Input | |
| 003 | 2 Words Input | |
| 004 | 3 Words Input | |
| 005 | 4 Words Input | |
| 006 | 5 Words Input | |
| 007 | 6 Words Input | |
| 800 | 7 Words Input | |
| 009 | 8 Words Input | |
| 010 | 9 Words Input | |
| 011 | 10 Words Input | |
| 012 | 11 Words Input | |
| 013 | 12 Words Input | |
| 014 | 13 Words Input | |
| 015 | 14 Words Input | |
| 016 | 15 Words Input | |
| 017 | 16 Words Input | |
| 018 | 1 Word Output | |
| 019 | 2 Words Output | |
| 020 | 3 Words Output | |
| 021 | 4 Words Output | |
| 022 | 5 Words Output | |
| 023 | 6 Words Output | |
| 024 | 7 Words Output | |
| 025 | 8 Words Output | |
| 026 | 9 Words Output | |
| 027 | 10 Words Output | |
| 028 | 11 Words Output | |
| 029 | 12 Words Output | |
| 030 | 13 Words Output | |
| 031 | 14 Words Output | |
| 032 | 15 Words Output | |
| 033 | 16 Words Output | |

The *Module Description* filter can be used in conjunction with the wildcard character ("*") to easily locate the required module. Once the required module has been selected press the *Ok* button.

The module will be added to the Slot configuration. The layout of the slot configuration differs slightly depending on whether Logix, Explicit EtherNet/IP, or Modbus has been selected as the Primary Interface.

| Glot Co | onfiguration | | | | | | | | | | Add Module |
|---------|----------------------------|--------|---|---|----------|--------|-----------|--------|----------------|-----------|--------------|
| Slot | Description | Module | | | Data Poi | int | Data Type | • | Byte Length | DP Offset | Ext User Prm |
| 1 | 1 Inputs 03-Input: 4 Bytes | | + | | Input | \sim | REAL | \sim | 4 | 0 | (null) |
| | Outputs | | + | X | Output | \sim | INT | ~ | 4 | 0 | |

Figure 3.78 – Slot configuration – (Logix)

| 1yPLX5 | 51-PBM - 2 - D | evice Configuratio | n | | | | | | | | | | | | |
|---------|-----------------|--------------------|------------|--------|------|---------------|------------|-------------------|--------|----------------|----------|--------|---------------|-----------|--------------|
| neral | Profibus Config | uration DPV1 Us | ser Parar | neters | Slot | Configuration | n) S | itart-up Paramete | ers | DPV1 Objects | DPV1 A | lams | | | |
| Slot Co | nfiguration | | | | | | | | | | | | | | Add Module |
| Slot | Description | Module | | | | Data Poi | nt | Data Type | | Byte Length | Register | Туре | Modbus Offset | DP Offset | Ext User Prm |
| 1 | Inputs | 03-Input: 4 Bytes | | + | | Input | \sim | REAL | \sim | 4 | HR | \sim | 5000 | 0 | (null) |
| | Outputs | | | + | Х | Output | \sim | INT | \sim | 4 | HR | \sim | 5002 | 0 | |
| | | 03-input. 4 bytes | | | X | | | | | | | | | - | (nun) |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | - : | ~ | | 70 0 | ~ + | configura | 4:0 | n (Ma | طامیرم) | | | | |



| WyPLX51-PBM - 2 - Device Configuration | | | | | | | | | | | | | |
|--|------------------------------------|------------------------------|---------------------|------|--------|---------|--------|----------|--------|----------------|--------------|--------------|--------------|
| General | Profibus Configuration DPV1 User P | arameters Slot Configuration | Start-up Parameters | DPV1 | Object | DPV1A | larm | 5 | | | | | |
| Slot C | Configuration | | | | | | | | | | | [| Add Module |
| Slot | Slot Description Module | | | | | Data Po | oint | Data Typ | е | Byte Length | Table Offset | DP Offset | Ext User Prm |
| 1 | Input4Bytes | 03-Input: 4 Bytes | | | + | Input | \sim | REAL | \sim | 4 | 0 | 0 | |
| 2 | 2 Output4Bytes 08-Output: 4 Bytes | | | | + | Output | \sim | REAL | \sim | 4 | 4 | 0 | |
| | | | | | | | | | | | | | |

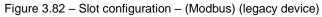
Figure 3.80 – Slot configuration – (Explicit EtherNet/IP)

When the module is emulating the legacy device, the slot configuration for Logix, Modbus, and Explicit EtherNet/IP will appear as follows:

| ieral | Profibus Configuration DPV1 | User Parameters Slot Configuration Sta | ап-ир н | rarame | ters | DPVIObjec | πs | DPVI Alarms | | | | |
|------------------|-----------------------------|--|---------|--------|------|-----------|--------|-------------|--------|----------------|-----------|--------------|
| lot Co | onfiguration | | | | | | | | | | | Add Module |
| Slot Description | | Module | | | | Data Poi | nt | Data Type | | Byte Length | DP Offset | Ext User Prm |
| | a2WordsInput | 03-2 Words Input | | + | | Input | \sim | SINT | \sim | 4 | 0 | (null) |
| 2 | a12WordsOutput | 29-12 Words Output | | + | | Output | \sim | INT | \sim | 24 | 0 | (null) |

Figure 3.81 – Slot configuration – (Logix) (legacy device)

| Slot | Description | Module | | Data Poi | nt | Data Type | Byte Length | Register Typ | pe | Modbus Offset | DP Offset | Ext User Prm |
|------|--------------|------------------|---|----------|--------|-----------|----------------|--------------|--------|---------------|-----------|--------------|
| 1 | a2WordsInput | 03-2 Words Input | + | Input | \sim | SINT | ~ 4 | HR 🗸 | | 0 | 0 | (null) |
| 2 | a12WordsOu | 29-12 Words Out | + | Output | \sim | INT | ~ 24 | HR | \sim | 4 | 0 | (null) |



| /lyPLX | 51-PBM - 4 - Device C | onfiguration | | | | | | | | | | | |
|-------------------------------|------------------------|----------------------|----------|----------|---|---------------|--------|--------------|-----|----------------|--------------|-----------|--------------|
| eneral | Profibus Configuration | DPV1 User Parameters | Slot Con | figurati | n | Start-up Para | meter | s DPV1 Objec | cts | DPV1 Alarms | | | |
| Slot Configuration Add Module | | | | | | | | | | | | | |
| Slot | Description | Module | | | | Data Poi | nt | Data Type | | Byte Length | Table Offset | DP Offset | Ext User Prm |
| 1 | a2WordsInput | 03-2 Words Input | | + | | Input | \sim | SINT | ~ | 4 | 0 | 0 | (null) |
| | a12WordsOutput | 29-12 Words Output | | + | | Output | ~ | INT | ~ | 24 | 4 | 0 | (null) |

Figure 3.83 – Slot configuration – (Explicit EtherNet/IP) (legacy device)

Slot Configuration - General

Each module added can consist of one or more Data Points. In the example below the module has two Data Points, one Input and one Output.

The description of each is based on the module name (from GSD file) but can be edited by the user. When using Logix this Description is used to create the member of the device-specific UDTs and thus no illegal Logix characters are permitted. It is also important that these descriptions are unique within a device.

| Slot C | onfiguration | | | | | | | | | | | | Add Module |
|--------|--------------|--------|--|--------|---|---|----------|-----|-----------|--------|----------------|-----------|-------------|
| Slot | Description | | | Module | | | Data Poi | int | Data Type | | Byte Length | DP Offset | Ext User Pm |
| 1 | Inputs | Inputs | | | + | | Input | ~ | REAL | \sim | 4 | 0 | (null) |
| | Outputs | | | | + | X | Output | ~ | INT | \sim | 4 | 0 | |

Figure 3.84 – Slot descriptions

When adding a slot, the data format and size will default to that of the selected module in the GSD file.

Formatting the module's data can be achieved by a combination of adding or removing Data Points and changing the Data Type of each.

Data Points can be added by either right-clicking on the module and selecting *Add Data Point* or by clicking on the "+" button.

Data Points can be removed by either right-clicking on the module and selecting **Delete Data Point** or by clicking on the "**X**" button.

| S | ot Description | Module | | | | | Data | a Point | | Data Ty | rpe | Byte Length | DP Offset | Ext User Prm |
|---|----------------|-------------------|-----|------|------|---------------------|--------|---------|--|---------|--------|----------------|--------------|--------------|
| 1 | DigitalInputs | 02-Input: 2 Bytes | | _ | | | | | | CINIT | \sim | | | (null) |
| | DigitalOutputs | + | | | | lodu | | | | [| \sim | 2 | 0 | |
| | | Q | 2 | Con | figu | ire N | /lodu | le | | | | | | |
| | | × | ۱ ا | Dele | ete | Module Nodule Up | | | | | | | | |
| | | 1 | - 1 | Nov | ve N | lodu | ule Up | С | | | | | | |
| | | 1 | - | Nov | ve N | lodu | ule Do | own | | | | | | |
| | | + | • , | ٩dd | l Da | ata P | oint | | | | | | | |
| | | 24 | (e | Dele | ete | Data | a Poin | nt | | | | | | |
| | | | | | | | | | | | | | | |

Figure 3.85 – Adding / Removing Data Points

NOTE: Each module must contain at least one Data Point.

After adding a new Data Point, the following should be configured:

- Description
- Data Point Type (Input, Output, None)
- Data Type
- Byte Length

| Slot | Description | Module | | | Data Po | oint | Data Typ | be | Byte Length | DP Offset | Ext User Prm |
|------|----------------|-------------------|---|---|---------|--------|----------|--------|----------------|--------------|--------------|
| 1 | DigitalInputs | 02-Input: 2 Bytes | + | | Input | \sim | SINT | \sim | 2 | 0 | (null) |
| | DigitalInputs2 | | + | Х | Input | \sim | SINT | \sim | 2 | 2 | |
| | DigitalOutputs | | + | Х | Output | \sim | SINT | \sim | 2 | 0 | |

Figure 3.86 – Configuring Data Points

After updating the Data Type, the Byte Length will be set to match the selected Data Type. By modifying the Byte Length thereafter, an array of that Data Type can be configured. It is however important that the Byte Length is always a multiple of the base Data Length.

| Table 3.19 – L | Data Type – Byte Length Restrictions |
|----------------|--------------------------------------|
| Data Type | Byte Length MUST be a multiple of: |
| BOOL | 1 |
| SINT | 1 |
| INT | 2 |
| DINT | 4 |
| REAL | 4 |

| Table 3.19 – Data | Type – Byte | e Length Restrictions | |
|-------------------|-------------|-----------------------|--|
| Tubio 0.10 Dulu | 1,700 0,00 | | |

IMPORTANT: It is critical that the configured Byte Length be a multiple of the base Data Type.

IMPORTANT: It is critical that the total sum of input and output bytes (of all the Data Points) match that required by the slave device. Not adhering to this could cause unexpected results.

NOTE: The DP (Byte) Offset for each the Data Point will be automatically calculated.

Slot Configuration – Logix Specific

When using Logix as the Primary Interface, the PROFIBUS Data Points will be packed and padded to match a device specific UDT. All the Inputs will be collated together and then all the Outputs.

IMPORTANT: It is important that the Data Point Descriptions do not contain any illegal characters and are not duplicated within a device. Failing to do so will create errors when generating and importing the mapping L5X into Studio 5000.

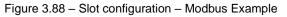
| Slot | Description | Module | | | Data Po | oint | Data Typ | e | Byte Length | DP Offset | Ext User Prm |
|------|----------------|-------------------|---|---|---------|--------|----------|--------|----------------|--------------|--------------|
| 1 | DigitalInputs | 02-Input: 2 Bytes | + | | Input | \sim | SINT | \sim | 2 | 0 | (null) |
| | DigitalInputs2 | | + | Х | Input | \sim | SINT | \sim | 2 | 2 | |
| | DigitalOutputs | | + | Х | Output | \sim | SINT | \sim | 2 | 0 | |

Figure 3.87 – Slot configuration – Logix Example

Slot Configuration – Modbus Specific

When using Modbus as the Primary Interface, it is important to configure the Modbus Register Type and Modbus Offset correctly to ensure that multiple Data Points are not mapped to the same Modbus data area.

| lot Co | onfiguration | | | | | | | | | | | | | Add Module |
|--------|--------------|-------------------|---|---|------------|--------|-----------|--------|----------------|------------|--------|---------------|-----------|--------------|
| Slot | Description | Module | | | Data Point | t | Data Type | | Byte Length | Register T | ype | Modbus Offset | DP Offset | Ext User Prm |
| 1 | Inputs | 03-Input: 4 Bytes | + | 1 | Input | \sim | INT | \sim | 8 | HR | \sim | 5000 | 0 | (null) |
| | Outputs | | + | X | Output | ~ | INT | \sim | 4 | HR | \sim | 5004 | 0 | |



IMPORTANT: It is important that the Data Point Register Type and Modbus Offset does not result in multiple Data Points overlapping. Such conflicts will cause unexpected results.

IMPORTANT: It is important that the Data Point Register Type is appropriate for the Data Type, Type (Input/Output) and Modbus interface type (Master/Slave).

IMPORTANT: The range of configured Modbus registers for each register type may not exceed 10,000.

To simplify the Modbus register assignment process, the user can select the **Assign Modbus from Here** option, after right-clicking on a particular mapped item. Once the assignment process is complete, all the mapped items below, and including, the selected item will be updated.

| Slot | Description | | | Module | | |
|------|------------------|------|----------|-------------------------|---|---|
| 1 | MainProcessValue | 01-1 | | La ser Madula | + | |
| | MainProcessValu1 | | T | Insert Module | + | X |
| | MainProcessVa3 | | \$ | Configure Module | + | X |
| | MainProcessVal5 | | × | Delete Module | + | X |
| 2 | a2ndCyclicValue | 02-2 | 1 | Move Module Up | + | |
| | a2ndCyclicValueS | | Ŧ | Move Module Down | + | X |
| 3 | DisplayValue | 03-0 | +• | Add Data Point | + | |
| | DisplayValueStat | | * | Delete Data Point | + | X |
| | | | ↓≡ | Assign Modbus from Here | | |

Slot Configuration

Figure 3.89 – Slot configuration – Selecting Assign Modbus from Here option

After selecting this option, the *Modbus Assignment* form will open.

| 🔅 Modbus A | ssignment | | | | x |
|------------|-----------|----------------|---------------|------|---|
| Modbus O | offsets | | Modbus Reads | | |
| IR | 0 | Next Available | Register Type | IR v | |
| HR | 256 | | Discrete Type | IS 🗸 | |
| IS | 0 | | | | |
| CS | 608 | | | | |
| | | | | | |
| | | Ok | Cancel | | |

Figure 3.90 – Modbus Assignment

The *Modbus Offsets* for each Modbus data type will default to the next available register after the last one referenced. These offsets will be used as the starting registers for the auto-assignment, and can be modified by the user as required.

The Next Available button, will return the offsets to their default values.

The automatic assignment of registers will take into account the data type of each data point. In the case of Modbus reads, the assigned type could be either an Input Register (IR) or Holding Register (HR) for non-Booleans and either a Digital Input (IS) or Coil (CS) for Booleans.

The user can specify their preference using the **Register Type** and **Discrete Type** combo box options in the **Modbus Reads** section.

Once the *Ok* button has been clicked, the Modbus *Register Type* and *Modbus Offset* for the selected, and subsequent items, will be updated.

Slot Configuration – Explicit EtherNet/IP Specific

When using Explicit EtherNet/IP as the Primary Interface, it is important to configure the Table Offset correctly to ensure that multiple Data Points are not mapped to the same Data Table area.

| neral | I Profibus Configuration DPV1 User | Parameters Slot Configuration | Start-up Parameters | DPV1 | Objects | DPV1 Alarm | s | | | | |
|--------|------------------------------------|-------------------------------|---------------------|------|---------|------------|-----------|----------------|--------------|--------------|--------------|
| | | | | | | | | | | | |
| Slot C | Configuration | | | | | | | | | | Add Module |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Slot | t Description | Module | e | | | Data Point | Data Type | Byte Length | Table Offset | DP Offset | Ext User Prm |
| | t Description | Module 03-Input: 4 Bytes | 9 | 4 | F | Data Point | | Byte Length | Table Offset | | Ext User Prm |

Figure 3.91 – Slot configuration – Explicit EtherNet/IP Example

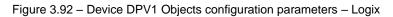
IMPORTANT: It is important that the Data Point Register Type and Data Table Offset does not result in multiple Data Points overlapping. Such conflicts will cause unexpected results.

IMPORTANT: The range of configured Data Table Offsets for each register type may not exceed 10,000.

3.9.6 DPV1 Objects

The DPV1 Objects configuration is shown in the figure below. The slave device DPV1 Objects configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

| MyPLX51-PBMSlave - 2 - Device Configuration | | | | | | | | | |
|---|------|-------|------|------------|--------|-----------------|--|--|--|
| General Profibus Configuration DPV1 User Parameters Slot Configuration Start-up Parameters DPV1 Objects DPV1 Alarms | | | | | | | | | |
| DPV1 Objects | | | | | | | | | |
| | Slot | Index | Size | Functions | | Terneme | | | |
| | SIOT | Index | Size | Functions | | Tagname | | | |
| • | 51 | 1 | 32 | Read/Write | \sim | Slave01_Tagname | | | |
| | | | | | ~ | | | | |
| - | | | | | | | | | |



| • • I | | | - | | | Parameters DPV1 Obje | |
|---------|--------------------|------------------|----------------|-------------------------|---------|------------------------|-----------------|
| General | Profibus Configura | ation DPV1 U | ser Parameters | Slot Configuration S | tart-up | Parameters DPV10bje | cts DPV1 Alarms |
| DPV1 | Objects | | | | | | |
| DPV1 | - | Index | Sizo | Functions | | Modbus Address | |
| DPV1 | Objects Slot | Index | Size | Functions | | Modbus Address | |
| DPV1 | - | Index 1 | Size 32 | Functions Read/Write | ~ | Modbus Address 3402 | |

Figure 3.93 – Device DPV1 Objects configuration parameters – Modbus

The DPV1 configuration consists of the following parameters:

Table 3.20 – Device DPV1 Objects configuration parameters

| Parameter | Description |
|----------------|---|
| Slot | The Slot number to which the PROFIBUS DP transaction will be directed. |
| Index | The Index number to which the PROFIBUS DP transaction will be directed. |
| Size | The size (bytes) of the transaction. |
| Functions | The Functions supported by the Slave device for this object: Read Write Read/Write |
| Tagname | The Logix Tagname where the data will be read / written. (Logix Only) |
| Modbus Address | The Modbus Holding Register Address where the data will be read / written. (Modbus Only) |

The Logix Tagname can be either entered manually or selected using the Logix Tag Browser. The Tag Browser can be launched by clicking on the Browse button (...) adjacent to the Tagname.

NOTE: The list of Logix tags will not be available if the Logix controller path has not been correctly configured.

| 💠 Logix Tag Browser | | _ | | x | | |
|-----------------------------|------------------------------|-----------|----|---|--|--|
| 2 🔁 🖿 📼 | | | | | | |
| ▲ | Dete Ture | | | | | |
| Tagname | Data Type | | - | _ | | |
| + MyPLX51PBM1:I1 | _0135:PLX51_PBM_7E6CF713:I:0 | | | | | |
| + MyPLX51PBM1:I2 | _0135:PLX51_PBM_7E6CF713:I:0 | | | | | |
| + MyPLX51PBM1:I3 | _0135:PLX51_PBM_7E | 6CF713:I: | 0 | | | |
| + MyPLX51PBM1:I4 | _0135:PLX51_PBM_7E | 6CF713:I: | 0 | | | |
| + MyPLX51PBM1:O1 | _0135:PLX51_PBM_78F | 5E13D:O | :0 | | | |
| + MyPLX51PBM1:O2 | _0135:PLX51_PBM_78F5E13D:O:0 | | | | | |
| + MyPLX51PBM1:O3 | _0135:PLX51_PBM_78F5E13D:O:0 | | | | | |
| + MyPLX51PBM1:O4 | 0135:PLX51 PBM 78F5E13D:O:0 | | | | | |
| + MyPLX51PBM1_iTEMPPATMT184 | MyPLX51PBM1_1523EC4B | | | | | |
| + MyPLX51PBM1_MasterControl | PSPLX51DPMasterControl | | | | | |
| + MyPLX51PBM1_MasterStatus | PSPLX51DPMasterStatus | | | | | |
| -Program:MainProgram | Program | | | | | |
| + Slave01 Description | SINT[64] | | | | | |
| + Slave01_Tagname | SINT[32] | | | | | |
| | | | | | | |
| | | | | | | |
| Ok | Cancel | | | | | |
| OK | Calicel | | | | | |
| Tag DB Build Complete | | | | | | |

Figure 3.94 – Device DPV1 Objects Tag Browsing

3.9.7 DPV1 Alarms

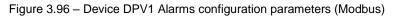
The DPV1 Alarms configuration is shown in the figure below. The slave device DPV1 Alarms configuration window is opened by either double clicking on the slave device in the tree or right-clicking the slave device and selecting *Configuration*.

IMPORTANT: The Size of the DPV1 Alarm **must** be greater than 4 or the alarm triggering will not execute.

| ieneral | Profibus Configura | tion DPV1 | User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms | |
|---------|--------------------|-----------|-----------------|--------------------|---------------------|--------------|-------------|--|
| - 00/ | 1. 41 | | | | | | | |
| DPV | 1 Alarms | | | | | | | |
| | | | | | | | | |
| | 0 | | | | | | | |
| | Size | | | Tagna | ame | | | |

Figure 3.95 – Device DPV1 Alarms configuration parameters (Logix)

| MyPLX51-PBMSlave - 2 - Device Configuration | | | | | | | | | |
|---|------------------------|------------------|--------------------------|---------------------|--------------|-------------|--|--|--|
| General | Profibus Configuration | DPV1 User Parame | eters Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms | | | |
| | CDPV1 Alarms | | | | | | | | |
| | | | | | | | | | |
| | Size | Modbus Address | | | | | | | |
| • | 32 | 3708 | | | | | | | |
| | | | | | | | | | |



The DPV1 configuration consists of the following parameters:

Table 3.21 – Device DPV1 Alarms configuration parameters

| Parameter | Description |
|----------------|---|
| Size | The size (bytes) of the Alarm object. |
| Tagname | The Logix Tagname from where the alarm data will be read. (Logix Only) |
| Modbus Address | The Modbus Holding Register Address from where the alarm data will be read. (Modbus Only) |

Note: The DP Master connected to the PLX51-PBM (in slave mode) will be able to configure either of the following alarms: Diagnostic Alarm, Process Alarm, Pull Plug Alarm, Status Alarm, Update Alarm, Manufacturer Specific Alarm.

3.10 Logix Configuration

The PLX51-PBM can be easily integrated with Allen-Bradley Logix family of controllers. Integration with the Logix family in Studio5000 makes use of the EDS Add-On-Profile (AOP) or a Generic Module Profile.

3.10.1 EDS AOP (Logix V21+)

Before the module can be added to the tree the module's EDS file must be registered.

Using RSLinx, the EDS file can be uploaded from the device after which the EDS Hardware Installation tool will be invoked to complete the registration.

Alternatively, the EDS file can be downloaded from the product web page at <u>www.prosoft-technology.com</u> and registered manually using the EDS Hardware Installation Tool shortcut under the Tools menu in Studio 5000.

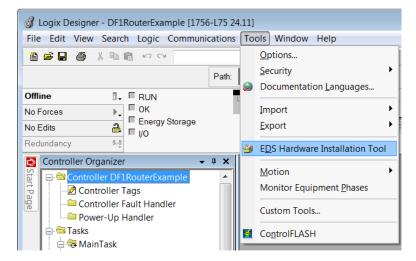


Figure 3.97 - EDS Hardware Installation Utility

After the EDS file has been registered, the module can be added to the Logix IO tree in Studio 5000. Under a suitable Ethernet bridge module in the tree, select the Ethernet network, right-click and select the New Module option.

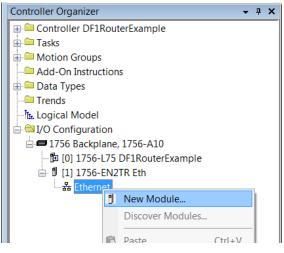


Figure 3.98 – Adding a module

The module selection dialog will open. To find the module more easily, use the Vendor filter to select only the ProSoft Technology modules as shown in the figure below.

| ect Module Type | | | |
|------------------------------------|------------------|------------------------------------|------------------|
| Catalog Module Discovery | Favorites | | |
| PLX | | Clear Filters | Show Filters * |
| Catalog Number | Description | Vendor Category | |
| PLX51-DF1-MSG | DF1 Messenger | Prosoft Tech Communications Adapte | ər |
| PLX51-DL | Data Logger | Prosoft Tech Communications Adapte |)r |
| PLX51-DLP | Data Logger Plus | Prosoft Tech Communications Adapte | |
| PLX51-PBM | PLX51-PBM | Prosoft Tech Communications Adapte | er |
| | | | |
| 4 of 466 Module Typ | es Found | | Add to Favorites |
| Close on Create | | Create | Close Help |

Figure 3.99 – Selecting the module

Locate and select the PLX51-PBM module and select the *Create* option. The module configuration dialog will open, where the user must specify the Name and IP address as a minimum to complete the instantiation.

| New Mo | lodule | × |
|---------------|---|----------------|
| General* (| Connection Module Info Internet Protocol Port Configuration | |
| Type: | PLX51-PBM PLX51-PBM | |
| Vendor: | Prosoft Technology | |
| Parent | eth2 | |
| Name: | PLX51_PBM01 Ethernet | |
| Description | ion: () Privat () Privat () Host I | |
| Module [| e Definition | |
| Revision | on: 1.001 | |
| Electroni | onic Keying: Compatible Module | |
| Connecti | ctions: I/O Connection Change | |
| Status: Creat | Pating | OK Cancel Help |

Figure 3.100 – Module instantiation

Once the instantiation is complete the module will appear in the Logix IO tree.

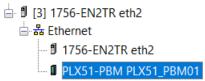


Figure 3.101 – Logix IO tree

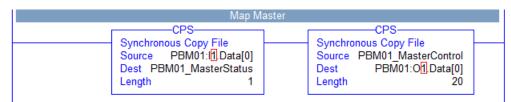
The Module Defined Data Types will automatically be created during the instantiation process. These data types provide meaningful structures to the module data. An excerpt of the Input Image is shown in the following figure.

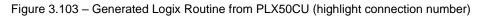
| E-PLX51_PBM01:I1 | _0135:PLX51_PBM_7E6CF7 | Read/Write |
|----------------------------------|------------------------|------------|
| PLX51_PBM01:I1.ConnectionFaulted | BOOL | Read/Write |
| PLX51_PBM01:I1.Data | SINT[500] | Read/Write |
| | _0135:PLX51_PBM_78F5E1 | Read/Write |
| ⊞ PLX51_PBM01:I2 | _0135:PLX51_PBM_7E6CF7 | Read/Write |
| | _0135:PLX51_PBM_78F5E1 | Read/Write |
| ⊞ PLX51_PBM01:I3 | _0135:PLX51_PBM_7E6CF7 | Read/Write |
| E PLX51_PBM01:03 | _0135:PLX51_PBM_78F5E1 | Read/Write |
| ⊡·PLX51_PBM01:I4 | _0135:PLX51_PBM_7E6CF7 | Read/Write |
| ± PLX51_PBM01:04 | _0135:PLX51_PBM_78F5E1 | Read/Write |

Figure 3.102 – Module Defined Data Type

3.10.2 Generic Module Profile (Logix Pre-V21)

IMPORTANT: When using a Generic Module Profile, the user will need to modify the code generated by the PLX50CU to match the single connection profile. To do this the user must remove the connection number from the source and destination tag in the copy blocks (as shown in the example below).





| Map Ma | aster |
|--|---|
| CPS- | CPS |
| Synchronous Copy File Source PBM01:I.Data[0] Dest PBM01_MasterStatus | Synchronous Copy File Source PBM01_MasterControl Dest PBM01:O.Data[0] |
| Length 1 | Length 20 |

Figure 3.104 – Modified Logix Routine from PLX50CU for Generic Module Profile

When using Logix versions prior to version 21, then the PLX51-PBM module must be added to the RSLogix 5000 I/O tree as a generic Ethernet module. This is achieved by right clicking on the Ethernet Bridge in the RSLogix 5000 and selecting *New Module* after which the *ETHERNET-MODULE* is selected to be added as shown in the figure below.

NOTE: See the next section for importing the configuration (L5X).

| | Select Module | | × |
|---|--------------------------------|--|--|
| i /O Configuration i = 1756 Backplane, 1756-A4 i [0] 1756-L75 PLX51_PBx i [1] 1756-EN2TR eth i [1] 1756-EN2TR eth i [2] Paste Ctrl+V Print → | - E1 Plus - ETHERNET-BRIDGE | Description ID Reader ID (100 Mbps Ethernet Port on DriveLogix5730 Electronic Overload Relay Communications Interface Generic EtherNet/IP CIP Bridge Generic EtherNet/IP Ethernet Valve Manifold SIU Ethernet Gatawav Find | Vendor Cognex Corp ~ Rockwell Aut Rockwell Aut Rockwell Aut Rockwell Aut Rockwell Aut SMC Corpora SMC Corpora SMC Corpora SMC Corpora SMC Corpora SMC Corpora SMC Corpora |
| | By Category By Ven | dor Favorites OK Cancel | Help |

Figure 3.105 - Add a Generic Ethernet Module in RSLogix 5000

The user must enter the IP address of the PLX51-PBM module that will be used. The assembly instance and size must also be added for the input, output, and configuration in the connection parameters section.

The required connection parameters for the PLX51-PBM module are shown below:

| Table 3.22 - | · RSLogix class 1 | connection | parameters | for the | PLX51-PBM module |
|--------------|-------------------|------------|------------|---------|------------------|
| | | | | | |

| Connection Parameter | Assembly Instance | Size |
|----------------------|-------------------|-------------|
| Input | 132 | 500 (8-bit) |
| Output | 133 | 496 (8-bit) |
| Configuration | 102 | 0 (8-bit) |

| New Module | | | | | × |
|---|--|--|--|---|---|
| Type: Vendor: Parent: Name: Description: | ETHERNET-MODULE Generic Ethernet Rockwell Automation/Allen-Bradley eth PLX51PBM | Connection Parar | neters Assembly Instance: 132 | Size: 500 • (8-bit) 496 • (8-bit) | |
| Comm Format: Address / Ho IP Addres O Host Nan | st Name ss: 192 . 168 . 1 . 172 | Output: Configuration: Status Input: Status Output: | | 496 | |
| 🗹 Open Module | e Properties | OK | Can | icel Help | |

Figure 3.106 - RSLogix 5000 General module properties for PLX51-PBM module

IMPORTANT: The user will need to enter the exact connection parameters before the module will establish a class 1 connection with the Logix controller.

Next, the user needs to add the connection requested packet interval (RPI). This is the rate at which the input and output assemblies are exchanged. Refer to the technical specification section in this document for further details on the limits of the RPI.

| Module Properties: eth (ETHERNET-MODULE 1.1) |
|---|
| General Connection* Module Info |
| Requested Packet Interval (RPI): 50.0 — ms (1.0 - 3200.0 ms) |
| Major Fault On Controller If Connection Fails While in Run Mode |
| Use Unicast Connection over EtherNet/IP |
| Module Fault |
| Status: Offline OK Cancel Apply Help |

Figure 3.107 - Connection module properties in RSLogix 5000

Once the module has been added to the RSLogix 5000 I/O tree the Logix controller will be ready to connect to the PLX51-PBM with a Class 1 connection.

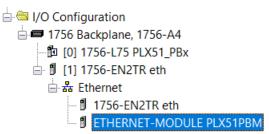


Figure 3.108 - RSLogix 5000 I/O module tree

3.10.3 Multi-Connection

The PLX51-PBM supports up to four Class 1 (cyclic data exchange) connections. This will allow the user to have more field devices per PLX51-PBM because more data can be exchanged between the Logix controller and the PLX51-PBM.

IMPORTANT: This only applies when the user has implemented the PLX51-PBM into Logix using an EDS AOP. When using a Generic Module Profile in Logix (pre-Logix v21) the user will only be able to use 1 Logix Connection.

When the user verifies the PLX50 Configuration Utility project (this is done by rightclicking on the device and selecting *Verify Configuration*), the software will indicate if all the current configuration will fit into the selected EtherNet/IP Connection count. If not, the user will need to increase the connection count.

In the PLX50 Configuration Utility the user can set the number of EtherNet/IP Connections in the Logix tab of the configuration window (as shown below):

| MyPLX51-PBM - Configuration General Modbus Modbus Addressing | g Profibus Logix | Advanced |
|--|------------------|----------|
| Logix EtherNet/IP Connections Controller Path | 1 × | |
| Response Timeout | 500 | (ms) |

Figure 3.109 – PLX50CU EtherNet/IP Connection Count

In Logix the user can increase/decrease the connection count using the EDS AOP (as shown below):

| Module Prope | rties: eth2 (PLX51-PBM 1.001) | | | | | | | | | |
|-----------------------|--|---------|-------|---------------------|------------------|------------|-------|--------|----------------------|---------|
| General Conne | ction Module Info Internet Protocol Port Configu | ration | | | | | | Filter | - | |
| Type: | PLX51-PBM PLX51-PBM | | | | | | | | Description | Constan |
| Vendor: | Prosoft Technology | | | | | | | | | |
| Parent | eth2 | | | | | | | | | |
| Na <u>m</u> e: | PBM01 | | Ethe | rnet Address | | | | | | |
| Descri <u>p</u> tion: | | | | rivate Network: 192 | 2.168.1. | 72 💲 | | | | |
| Desengaon. | | | | Module Definitio | on | | | | | × |
| | | | F | levision: | 1 | ~ | 001 🜩 | | | |
| | | | E | lectronic Keying: | Compatil | ole Mo | dule | | ~ | |
| | | | C | onnections: | | | | | | |
| | | ~ | 1r | Name | | Size | | Tag S | Suffix | |
| Module Definit | | | | I/O Connection | | 500 | SINT | 1 | PBM01:I1 | |
| Revision: | 1.001 | | - Itt | | Output Input: | 496 500 | | | PBM01:01 PBM01:12 | 1 |
| Electronic Key | • | | | I/O Connection 2 | Output | | SINT | 2 | PBM01:02 | |
| Connections: | I/O Connection I/O Connection 2 | ^ | | I/O Connection 3 | Input: | 500 | SINT | 3 | PBM01:I3 | |
| | I/O Connection 2 I/O Connection 3 | ~ | | | Output | 496 500 | | Ľ | PBM01:03 PBM01:14 | |
| | "O Competition o | · · · · | | I/O Connection 4 | Input: Output | | SINT | 4 | PBM01:14 PBM01:04 | |
| | | Change | | | output | | 1 | - | | |
| | | | | | | | | | | |
| Status: Offline | | | (| | | | | | | |
| * PBS01 | PLX51PBS.Output.Control.StationNumber | 2 | De | | | ОК | | Cance | el H | elp |
| DDC01 | DI VE1DBS Output Control Morm Triggor | | Dom | | | | | | | |

Figure 3.110 – Logix EtherNet/IP Connection Count

3.11 Logix Mapping

The PLX50 Configuration Utility will generate the required UDTs and Routines (based on the PLX51-PBM configuration) to map the required PROFIBUS Slave input and output data. The user will need to generate the required Logix and UDTs by right-clicking on the module in the PLX50 Configuration Utility and selecting the *Generate Logix L5X* option.

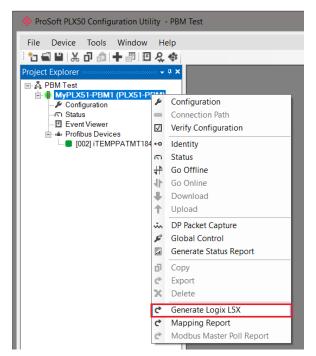


Figure 3.111 – Selecting Generate Logix L5X

The user will then be prompted to select a suitable file name and path for the L5X file.

| 🚸 Select a Logix XML Impor | :/Export File | | x |
|---|----------------------------------|-------------------|------------------|
| \leftarrow \rightarrow \checkmark \uparrow $\boxed{1}$ \rightarrow This | PC > Local Disk (C:) > Documents | ✓ ひ Search Docum | ents 🔎 |
| Organize 🔹 New folder | | | |
| 🗸 📌 Quick access | ∧ Name ▲ | Date modified | Туре |
| 🔚 Desktop | ★ MyPLX51-PBM1.L5X | 2018/11/23 9:08 A | Logix Designer X |
| 🔈 Downloads | * | | |
| Documents | * | | |
| 📜 ProSoft Technology | * 🗸 🤇 | | > |
| File name: MyPLX | (51-PBM1.L5X | | ~ |
| Save as type: Logix X | (ML File (*.L5X) | | ~ |
| ∧ Hide Folders | | Save | Cancel |

Figure 3.112 – Selecting the Logix L5X file name

This L5X file can now be imported in to the Studio 5000 project by right-clicking on a suitable *Program* and selecting *Add*, and then *Import Routine*.

| Controller Organizer | | | | |
|--|-----------------|-----------|----|----------------------|
| 🖽 🗀 Controller ProfibusGate | way | | | |
| 🖨 📾 Tasks | | | | |
| 🖨 🚭 MainTask | | | | |
| 🖨 🖨 MainProgram | Add | • | B | New Routine |
| Parameter | 100 | | | |
| MainRouti | Cut | Ctrl+X | 2 | New Local Tag Ctrl+W |
| Here Motion Groups | Сору | Ctrl+C | | New Parameter |
| Add-On Instruction | Paste | Ctrl+V | _ | |
| 🕀 🧰 Data Types | Delete | Del | Ļ | Import Routine |
| - Trends | | | 1 | |
| | Verify | | ι. | |
| 🖹 🚔 I/O Configuration | Cross Reference | Ctrl+E | ι. | |
| 🖻 📼 1756 Backplane, | Browse Logic | Ctrl+L | | |
| 1756-L75 | | Carre | | |
| ⊡ ॻ [1] 1756-EN2 ॑ ॑ ॑ ॑ ॑ ॑ ╊ Ethernet | Online Edits | + | ι. | |
| 1756-El | Print | • | 1 | |
| PLX51- | | | | |
| | Export Program | | | |
| | Properties | Alt+Enter | | |

Figure 3.113 – Importing the L5X file into Studio 5000

In the file open dialog select the previously created L5X file and accept the import by pressing Ok.

The import will create the following:

- Mapping Routine
- Multiple UDT (User-Defined Data Types)
- Multiple Controller Tags

Since the imported mapping routine is not a Main Routine, it will need to be called from the current Main Routine.



Figure 3.114 – Calling the mapping routine

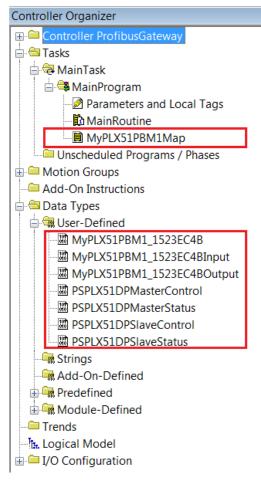


Figure 3.115 – Imported Logix Objects

A number of PLX51 specific (UDT) tags are created.

The Master Control tag is used to set the PROFIBUS Mode and to Enable the individual Slave Devices.

| MyPLX51PBM1_MasterControl | {} | | PSPLX51DPMasterControl |
|--|---------------------------------------|---------|------------------------|
| MyPLX51PBM1_MasterControl.MasterControl | rControl.MasterControl 3 Decimal SINT | | SINT |
| MyPLX51PBM1_MasterControl.DeviceEnable | {} | Decimal | BOOL[128] |
| MyPLX51PBM1_MasterControl.DeviceEnable[0] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[1] | 1 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[2] | 1 | Decimal | BOOL |
| -MyPLX51PBM1_MasterControl.DeviceEnable[3] | 1 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[4] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[5] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[6] | 0 | Decimal | BOOL |
| | | | |
| -MyPLX51PBM1_MasterControl.DeviceEnable[124] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[125] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[126] | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterControl.DeviceEnable[127] | 0 | Decimal | BOOL |

Figure 3.116 – Master Control tag

The Master Status tag displays the status of the PROFIBUS Master, including arrays to show the LiveList, Data Exchange Active, Alarm and Diagnostic pending status of each slave device.

| MyPLX51PBM1_MasterStatus | {} | | PSPLX51DPMasterStatus |
|---|------|---------|-----------------------|
| -MyPLX51PBM1_MasterStatus.ConfigValid | 1 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.Owned | 1 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.DuplicateDPStation | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusFieldbusError | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusDeviceError | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusOffline | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusStopped | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusClear | 0 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.ProfibusOperational | 1 | Decimal | BOOL |
| -MyPLX51PBM1_MasterStatus.SlaveMode | 0 | Decimal | BOOL |
| MyPLX51PBM1_MasterStatus.ConfigCRC | 1537 | Decimal | INT |
| MyPLX51PBM1_MasterStatus.DeviceLiveList | {} | Decimal | BOOL[128] |
| MyPLX51PBM1_MasterStatus.DeviceDataExchangeActive | {} | Decimal | BOOL[128] |
| MyPLX51PBM1_MasterStatus.DeviceAlarmPendingFlags | {} | Decimal | BOOL[128] |
| MyPLX51PBM1_MasterStatus.DeviceDiagnosticPendingFlags | {} | Decimal | BOOL[128] |

Figure 3.117 – Master Status tag

There is also a tag created for each configured slave device. The structure of which comprises the following:

- Input Status Status related to slave device
- Input Data As specified in the Input Data Points in the Slot configuration
- Output Control Used to trigger alarms
- Output Data As specified in the Output Data Points in the Slot configuration

| MyPLX51PBM1_iTEMPPATMT184 | {} | | MyPLX51PBM1_152365E6 |
|---|-----|---------|---------------------------|
| MyPLX51PBM1_iTEMPPATMT184.Input | {} | | MyPLX51PBM1_152365E6Input |
| HypLX51PBM1_iTEMPPATMT184.Input.Status | {} | | PSPLX51DPSIaveStatus |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.Online | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DataExchangeActive | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.IdentMismatch | 0 | Decimal | BOOL |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.DisabledByOutputAssembly | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DeviceError | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.AlarmPending | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DiagnosticsPending | 0 | Decimal | BOOL |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.OutputAssemblyNodeAddrMismatch | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.MappingCRCMismatch | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.SlaveClearOpMode | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.SlaveAlarmAck | 0 | Decimal | BOOL |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.StationNumber | 0 | Decimal | SINT |
| HMyPLX51PBM1_iTEMPPATMT184.Input.Status.DeviceMappingCRC | 0 | Decimal | INT |
| -MyPLX51PBM1_iTEMPPATMT184.Input.TemperaturePV | 0.0 | Float | REAL |
| MyPLX51PBM1_iTEMPPATMT184.Input.TemperatureSts | 0 | Decimal | SINT |
| HypLX51PBM1_iTEMPPATMT184.Output | {} | | MyPLX51PBM1_152365E6Outpu |
| HypLX51PBM1_iTEMPPATMT184.Output.Control | {} | | PSPLX51DPSIaveControl |
| MyPLX51PBM1_iTEMPPATMT184.Output.Control.StationNumber | 0 | Decimal | SINT |
| -MyPLX51PBM1_iTEMPPATMT184.OutputControl.AlarmTrigger | 0 | Decimal | BOOL |
| MyPLX51PBM1_iTEMPPATMT184.Output.Control.DeviceMappingCRC | 0 | Decimal | INT |
| -MyPLX51PBM1_iTEMPPATMT184.Output.DisplayValue | 0.0 | Float | REAL |
| MyPLX51PBM1_iTEMPPATMT184.Output.DisplayValueSts | 0 | Decimal | SINT |

Figure 3.118 - Slave Device-Specific tag

3.12 Importing the Add-On Instruction (AOI)

A custom Add-On Instruction (AOI) is offered and recommended for use in the performance and monitoring of Class 3 messaging (connected or unconnected) with the PLX51-PBM. The AOI offered implements custom UDT's, controller tags, and logic that instantiates the Ethernet/IP CIP messages to perform the following acyclic messaging services:

- DPV1 Class 1 Write/Read
- Alarms
- DPV1 Class 2 Initiate/Abort/Write/Read
- Extraction of Slave Diagnostics (DPV0)
- Global Control Commands
- 1 In the **Controller Organizer** window, expand the **Tasks** folder and double-click the **MainRoutine** under the **MainProgram** section.
- 2 Right-click on an empty rung in the routine, and click the *Import Rungs* option.

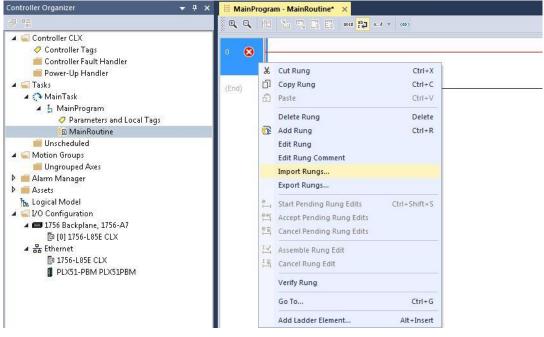


Figure 3.101 - Import Rung

3 Navigate to the location where the .L5X Add-On Instruction is saved. Select **Open**.

| Look in: | 🕕 A0I | • | G 🤌 📂 🖽 🗸 | | | |
|--|------------------------------|--|-------------------|------------------|----------|------------------------|
| (Ang | Name | * | Date modified | Туре | Size | |
| Recent Places Desktop Libraries Computer Ocomputer | PLX51_PBM | 1 <u>AOI_v1_0.15X</u> | 3/10/2020 1:56 PM | Logix Designer X | 173 KB) | |
| | File name: Files of type: | PLX51_PBM_A01_v1_0.L5X Logix Designer XML Files (*.L5X) | | | • | Open Cancel Help |

Figure 3.102 – AOI File Selection

4 The *Import Configuration* dialog box opens. It displays the controller tags to be created.

| oort Conter | | onfia | ure Tag References | | | | | | | |
|-------------|------------------------------------|-------|---------------------------|-----------|-----|------------------------------|-----|-------|-----------|-------|
| LBN | NainProgram | T | Import Name | Operation | -10 | Final Name | - F | Usage | Alias For | Data |
| | MainRoutine (Rungs) References | | A0IPLX51PBM | Create | D | A0IPLX51PBM | | Local | | AOIPI |
| 1 | | | PLX51PBM | Create | | PL×51PBM | | Local | | PL×5 |
| D | Add-On Instruction: | | PLX51PBM_MSGDPV1Class1 | Create | D | PLX51PBM_MSGDPV1Class1Alarm | | Local | | MESS |
| 1 | | 1 | PLX51PBM_MSGDPV1Class1 | Create | | PLX51PBM_MSGDPV1Class1Read | | Local | | MESS |
| - | | | PLX51PBM_MSGDPV1Class1 | Create | D | PLX51PBM_MSGDPV1Class1Write | | Local | | MESS |
| -Lo Error | s/Warnings | | PLX51PBM_MSGDPV1Class2 | Create | | PLX51PBM_MSGDPV1Class2Abort | | Local | | MESS |
| | | | PLX51PBM_MSGDPV1Class2 | Create | | PLX51PBM_MSGDPV1Class2Init | | Local | | MESS |
| | | 1 | | Create | | PLX51PBM_MSGDPV1Class2Read | | Local | | MESS |
| | | Ē | PLX51PBM_MSGDPV1Class2 | Create | D | PLX51PBM_MSGDPV1Class2Write | | Local | | MESS |
| | | | PLX51PBM_MSGGlobalControl | Create | | PLX51PBM_MSGGlobalControl | | Local | | MESS |
| | | | PLX51PBM_MSGSlaveDiagR | Create | | PLX51PBM_MSGSlaveDiagRequest | | Local | | MESS |
| | | • | | | | m | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| - | | | | | | | | | | |

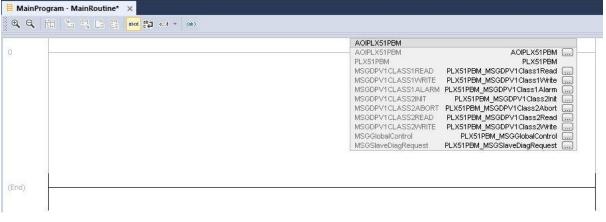
Figure 3.103 – Controller Tags Imported

5 Under the *Other Components* section, verify that the *Final Name* of the module matches the existing module name in your Logix project.

| Import Configuration - PLX51_PBM_AO | I_v1_0.15X | |
|--|---|----------------|
| 문 또 Find: Find Within: Final Name | Find/Replace | |
| Import Content: | | |
| | Configure Component References | |
| i 🔓 MainProgram | Import Name Operation Final Name Class Name | |
| References | PLX51PBM Use Existing PLX51PBM Vote Existing PLX51PBM | |
| | Parameters → ↓ 1/2 Configuration → ↓ 1/2 C | |
| | | |
| TT Preserve existing tag values in offline proje | ect | OK Cancel Help |
| Ready | | A. |

3.104 - Final Name of Module

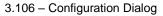
6 Click **OK** to perform the import. When complete, the Add-On Instruction rung appears in the routine.



3.105 – Add-On Instruction Rung

7 Click the Configuration Dialog box of one of the Ethernet/IP CIP messages.

| | AOIPLX51PBM AOIPLX51PBM aOIPLX51PBM aOIPLX51PBM PLX51PBM PLX51PBM PLX51PBM SGDPV1CLASS1READ PLX51PBM_MSGDPV1Class1Read and MSGDPV1CLASS1Write PLX51PBM_MSGDPV1Class1Atarm and MSGDPV1CLASS2NT PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2READ PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2REAT PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2REAT PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2REAT PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2REAT PLX51PBM_MSGDPV1Class2Abort and MSGDPV1CLASS2Abort and MSGDPV1CLA |
|------|--|
| End) | |



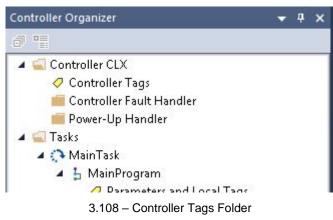
- 8 The Message Configuration window of the CIP message opens.
- **9** To ensure that the path of communication is correct, go to the *Communication* tab and click the **BROWSE** option of the Path parameter. Click the module within the *I/O Configuration* list, then click **OK**.

| Message Col | nfiguration - PLX51PBM_MSGDPV1Class1Read |
|---|--|
| Configuratio | n Communication Tag |
| Path | Browse |
| 🔿 Bro | Message Path Browser |
| Commu | Path: PLX51PBM |
| CIP | PLX51PBM |
| CIP Sou | □ I/O Configuration (Octal) |
| Co | |
| () Enable | |
| ⊖ Error Cod Error Path: Error Text: | e: Extended Error Code: 🔲 Timed Out 🕈 |
| | OK Cancel Apply Help |

3.107 – Message Path Browser

10 Click **OK** in the *Message Configuration* window. Repeat for every CIP message provided within the AOI.

11 Navigate to the *Controller Organizer* window. Double click on the *Controller Tags* folder.



12 The PLX51-PBM controller tags have been imported along with the Add-On Instruction. The *PLX51PBM.CONTROL* UDT contains the tags that control all of the acyclic messaging functions.

| A PLX51PBM | {} | {} | PLX51PB | AOIPLX51PBM |
|---|----|-----------|---------|-------------------------------------|
| PLX51PBM.CONTROL | {} | {} | PLX51PB | AOIPLX51PBM CONTROL CONTROLL |
| PLX51PBM.CONTROL.DPV1_Class1 | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 1 Read |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Initiate | 0 | Dec | BOOL | AOIPLX51PBM Initiate DPV1 Class 1 R |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus | {} | {} | PLX51PB | AOIPLX51PBM Message Status |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request | {} | {} | PLX51PB | AOIPLX51PBM Request |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response | {} | {} | PLX51PB | AOIPLX51PBM Response |
| PLX51PBM.CONTROL.DPV1_Class1.Write | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 1 Write |
| PLX51PBM.CONTROL.DPV1_Class1.Alarm | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 1 Alarm |
| PLX51PBM.CONTROL.DPV1_Class2 | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 2 |
| PLX51PBM.CONTROL.DPV1_Class2.Init | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 2 Init |
| PLX51PBM.CONTROL.DPV1_Class2.Abort | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 2 Abort |
| PLX51PBM.CONTROL.DPV1_Class2.Read | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 2 Read |
| PLX51PBM.CONTROL.DPV1_Class2.Write | {} | {} | PLX51PB | AOIPLX51PBM DPV1 Class 2 Write |
| PLX51PBM.CONTROL.SlaveDiagnostics | {} | {} | PLX51PB | AOIPLX51PBM Diagnostics Request |
| PLX51PBM.CONTROL.SlaveDiagnostics.Initiate | 0 | Dec | BOOL | AOIPLX51PBM Initiate Diagnostics Ex |
| PLX51PBM.CONTROL.SlaveDiagnostics.MSGStatus | {} | {} | PLX51PB | AOIPLX51PBM Message Status |
| PLX51PBM.CONTROL.SlaveDiagnostics.Request | {} | {} | PLX51PB | AOIPLX51PBM Request |
| PLX51PBM.CONTROL.SlaveDiagnostics.Response | {} | {} | PLX51PB | AOIPLX51PBM Response |
| PLX51PBM.CONTROL.GlobalControl | {} | {} | PLX51PB | AOIPLX51PBM Global Control |
| PLX51PBM.CONTROL.GlobalControl.Initiate | 0 | Dec | BOOL | AOIPLX51PBM Initiate Global Control |
| PLX51PBM.CONTROL.GlobalControl.MSGStatus | {} | {} | PLX51PB | AOIPLX51PBM Message Status |
| PLX51PBM.CONTROL.GlobalControl.Request | {} | {} | PLX51PB | AOIPLX51PBM Request |
| PLX51PBM.CONTROL.GlobalControl.Response | {} | {} | PLX51PB | AOIPLX51PBM Response |

3.109 - PLX51PBM.CONTROL Controller Tags

3.12.1 Class 3 Messaging

Γ

1 To perform Class 3 messaging with the AOI, you must first ensure that the PLX51-PBM is in the OPERATIONAL state and exchanging data with its configured nodes.

NOTE: The slave device must support DPV1 messaging. The *DPV1 Enable* bit must be set in the user parameters of the slave device in the PLX50 Configuration Utility.

2 Go to the Controller Tag of the acyclic function you want to perform, and verify that the *Request* parameters of the function are correct.

| {} | PLX51PBM.CONTROL.DPV1_Class1.Read |
|------|--|
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.Initiate |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Done |
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Error |
| 15 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.DoneCount |
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.ErrorCount |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.Request |
| 4000 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Timeout |
| 2 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlaveAddress |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlotNumber |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.RequestIndex |
| 10 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Length |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.Response |

Figure 3.110 – DPV1 Class 1 Read Request Parameters

3 Once verified, enter a value of '1' in the *Initiate* tag to send the Class 3 message.

| PLX51PBM.CONTROL.DPV1_Class1.Read | {} |
|--|------|
| PLX51PBM.CONTROL.DPV1_Class1.Read.Initiate | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Done | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Error | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.DoneCount | 15 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.ErrorCount | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Timeout | 4000 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlaveAddress | 2 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlotNumber | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.RequestIndex | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Length | 10 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response | {} |

Figure 3.111 – DPV1 Class 1 Read Initiate

4 Confirm the message was successfully sent by monitoring the *MSGStatus* tag.

| {} | PLX51PBM.CONTROL.DPV1_Class1.Read |
|------|--|
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.Initiate |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Done |
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Error |
| 15 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.DoneCount |
| 0 | PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.ErrorCount |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.Request |
| 4000 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Timeout |
| 2 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlaveAddress |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlotNumber |
| 1 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Index |
| 10 | PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Length |
| {} | PLX51PBM.CONTROL.DPV1_Class1.Read.Response |

Figure 3.112 – DPV1 Class 1 Read Message Status

5 The slave's response to the acyclic message function is shown in the *Response* tags.

| PLX51PBM.CONTROL.DPV1_Class1 | {} |
|---|--|
| PLX51PBM.CONTROL.DPV1_Class1.Read | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Initiate | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Done | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.Error | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.DoneCount | 15 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.MSGStatus.ErrorCount | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Timeout | 4000 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlaveAddress | 2 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.SlotNumber | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.RequestIndex | 1 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Request.Length | 10 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response | {} |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Status | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt | 0 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt | 0 |
| | Ó |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt | U |
| | 16#07 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt | |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength | 16#07 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Reserved | 16#07 16#00 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Reserved PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data | 16#07 16#00 16#64 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Reserved PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data1 | 16#07 16#00 16#64 16#88 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Reserved PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data1 PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data2 | 16#07 16#00 16#64 16#88 16#12 |
| PLX51PBM.CONTROL.DPV1_Class1.Read.Response.ExtendedSt PLX51PBM.CONTROL.DPV1_Class1.Read.Response.DataLength PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Reserved PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data1 PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data1 PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data2 PLX51PBM.CONTROL.DPV1_Class1.Read.Response.Data3 | 16#07 16#00 16#64 16#88 16#12 16#0b |

Figure 3.113 – DPV1 Class 1 Read Response

3.12.2 DPV1 Class 2 Initialize

To perform a DPV1 Class 2 Read/Write, a DPV1 Class 2 Initialize message must first be sent to the DPV1 Slave to begin the communication connection. The PLX51-PBM Add-On Instruction (AOI) handles the source/destination address information of the Initialization request. A detailed description of how the AOI controls the source/destination address information of the DPV1 Class 2 Initialize request is provided below. Please see *PROFIBUS DP* - *Master* on page 102 for more information on the DPV1 Class 2 Initialization Request parameters.

<u>Overview</u>

A DPV1 Class 2 Initialize (Init) request can be sent with or without additional source or destination address information. The additional address information includes the optional Network/MAC address. The parameters *Source Type* and *Destination Type* indicate the presence of the optional Network/MAC address. The DPV1 Class 2 Init request UDT provides 6 bytes for the Network address and 10 bytes for the MAC address, for both the Source and Destination. The Source/Destination Address Length must represent the total length of the Source/Destination address information sent within the DPV1 Class 2 Init request.

<u>Source Type = 0 & Destination Type = 0</u>

The Controller Tags for the DPV1 Class 2 Init request are populated with default values. The Source Type (Source_Type) and Destination Type (Dest_Type) are both set to **0**. Therefore, the Init request will be sent without the optional Source/Destination Network and MAC Address information.

| PLX51PBM.CONTROL.DPV1_Class2.Init.Request | {} { | | PLX51PBM_CONTRO | AOIPLX51PBM Request |
|---|------|---------|-----------------|---------------------|
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Timeout | 4000 | Decimal | DINT | AOIPLX51PBM Timeo |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.SlaveAddress | 2 | Decimal | SINT | AOIPLX51PBM Slave |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Reserved1 | 0 | Decimal | SINT | AOIPLX51PBM Reserv |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Reserved2 | 0 | Decimal | SINT | AOIPLX51PBM Reserv |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Reserved3 | 0 | Decimal | SINT | AOIPLX51PBM Reserv |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Send_Timeout | 10 | Decimal | INT | AOIPLX51PBM Send |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Features_Supp | 0 | Decimal | INT | AOIPLX51PBM Featur |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Profile_Features_Supp | 0 | Decimal | INT | AOIPLX51PBM Profile |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Profile_Ident_Number | 0 | Decimal | INT | AOIPLX51PBM Profile |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Type | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Addr_Len | 2 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Dest_Type | 0 | Decimal | SINT | AOIPLX51PBM Destin |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Dest_Addr_Len | 2 | Decimal | SINT | AOIPLX51PBM Destin |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_API | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_SCL | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_1 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_2 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_3 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_4 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_5 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_Net_Addr_6 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_1 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_2 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_3 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_4 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_5 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_6 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_7 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_8 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_9 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Source_MAC_Addr_10 | 0 | Decimal | SINT | AOIPLX51PBM Sourc |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Destination_API | 0 | Decimal | SINT | AOIPLX51PBM Destin |
| PLX51PBM.CONTROL.DPV1_Class2.Init.Request.Destination_SCL | 0 | Decimal | SINT | AOIPLX51PBM Destin |

Figure 3.113 - DPV1 Class 2 Init Request Default Values

When the DPV1 Class 2 Init is initiated, and the Source Type (Source_Type) and Destination Type (Dest_Type) are both **0**, the AOI will set:

- The Source Address Length (Source_Addr_Len) and Destination Address Length (Dest_Addr_Len) to 2.
- The Ethernet/IP CIP Message Request length (MSGDPV1CLASS2INIT.REQ_LEN) to 24.
- Copies the Destination API (Destination_API) and Destination SCL (Destination_SCL) to the appropriate locations of the request.

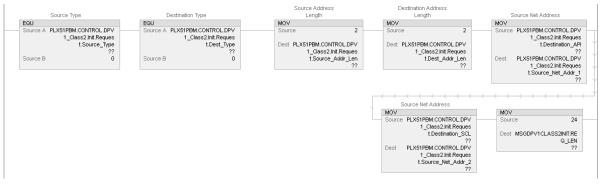


Figure 3.114 – Implemented AOI Logic for Source/Destination Type = 0

Source Type = 1 & Destination Type = 0

When the DPV1 Class 2 Init is initiated, and the Source Type (Source_Type) is **1** and the Destination Type (Dest_Type) is **0**, the AOI will set:

- The Source Address Length (Source_Addr_Len) to 18.
- The Destination Address Length (Dest_Addr_Len) to 2.
- The Ethernet/IP CIP Message Request length (MSGDPV1CLASS2INIT.REQ_LEN) to **40**.



Figure 3.115 – Implemented AOI Logic for Source Type = 1 and Destination Type = 0

Source Type = 0 & Destination Type = 1

When the DPV1 Class 2 Init is initiated, and the Source Type (Source_Type) is **0** and the Destination Type (Dest_Type) is **1**, the AOI will set:

- The Source Address Length (Source_Addr_Len) to 2.
- The Destination Address Length (Dest_Addr_Len) to 16.
- The Ethernet/IP CIP Message Request length (MSGDPV1CLASS2INIT.REQ_LEN) to **38**.
- Copies all of the Destination address information tags (API, SCL, Network/MAC Address) to the appropriate tags of the request message.

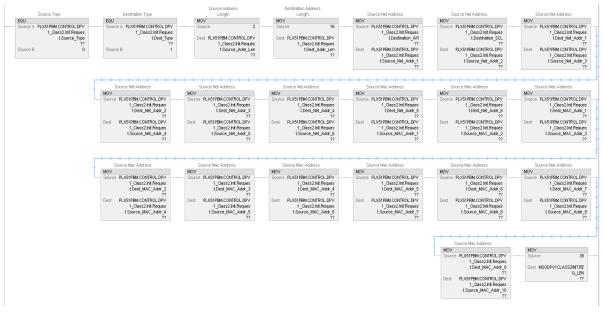


Figure 3.116 – Implemented AOI Logic for Source Type = 0 and Destination Type = 1

Source Type = 1 & Destination Type = 1

When the DPV1 Class 2 Init is initiated, and the Source Type (Source_Type) and Destination Type (Dest_Type) are both **1**, the AOI will set:

- The Source Address Length (Source_Addr_Len) and the Destination Address Length (Dest_Addr_Len) both to 18.
- The Ethernet/IP CIP Message Request length (MSGDPV1CLASS2INIT.REQ_LEN) to 56.

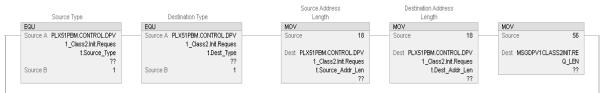


Figure 3.117 – Implemented AOI Logic for Source/Destination Type = 1

4 SD Card

The PLX51-PBM supports an SD Card (see below) which can be used for disaster recovery. The SD Card can be pre-loaded with the required firmware and/or application configuration.

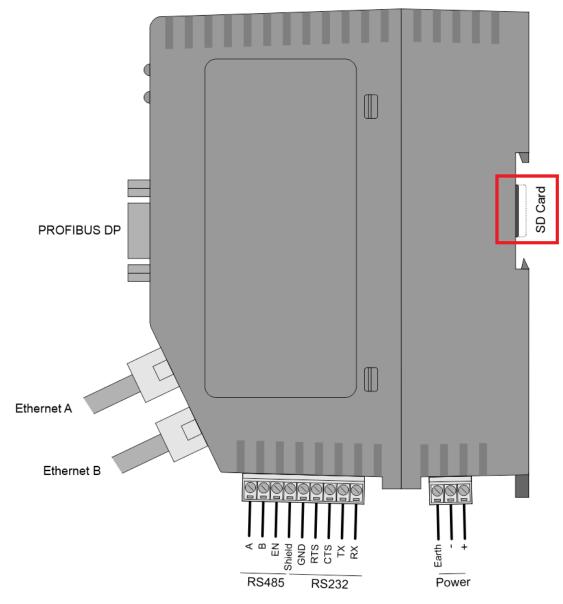


Figure 4.1 - Module Side View - SD Card Slot

IMPORTANT: The user will need to ensure that the SD Card has been formatted for FAT32.

IMPORTANT: All needed files must be copied into the root directory of the SD Card. The module will not use files which are located in folders.

4.1 Firmware

The user can copy the required firmware (which can be downloaded from the ProSoft website) onto the root directory of the SD Card.

| ♣ ☑ □ = Manage Secure Digital storage device (D:) | | _ | |
|---|------------------|-------------|--------------|
| File Home Share View Drive Tools | | | × (?) |
| \leftarrow \rightarrow \checkmark \uparrow \clubsuit > This PC $>$ Secure Digital storage device (D:) | ~ Ŭ | | al storage 🔎 |
| ✓ 🗦 This PC | Date modified | Туре | Size |
| > 🗊 3D Objects | 2019/06/18 12:54 | File folder | |
| > Contraction Desktop PLX51_PBM_1001022.afb | 2019/09/18 15:16 | AFB File | 557 KB |
| > 🖹 Documents | | CFG File | 35 KB |
| > 🕹 Downloads | | | |
| > 🎝 Music | | | |
| > 🖻 Pictures | | | |
| > 🛃 Videos | | | |
| > 😓 Local Disk (C:) | | | |
| > 😓 Secure Digital storage device | | | |
| > 鼻 Secure Digital storage device (I | | | |
| > 🥩 Network | | | |
| 3 items | | | : |

Figure 4.2 - SD Card - Firmware file

IMPORTANT: The filename of the firmware file must not be changed. The specific module will use only the firmware that is valid (e.g. the PLX51-PBM will only use the PBM firmware file).

IMPORTANT: If more than one firmware file, with different firmware revisions, of the same product is on the SD Card it can cause the module to constantly firmware upgrade the module.

If a faulty module is replaced the user can insert the SD Card with the firmware file on into the new module. While the module is booting it can detect if the firmware on the new module is different from that on the SD Card. If yes, the firmware will either be upgraded or downgraded to the firmware revision on the SD Card.

4.2 Configuration

If a faulty module is replaced the user can insert the SD Card with the configuration file on into the new module. The new module will determine if the configuration on the SD Card is different than the currently loaded configuration (even when there is no configuration on the module). If different, the configuration on the SD Card will be downloaded into the module's NV memory before the module starts executing.

The user can add the PLX50CU configuration file to the SD Card root directory in one of two ways.

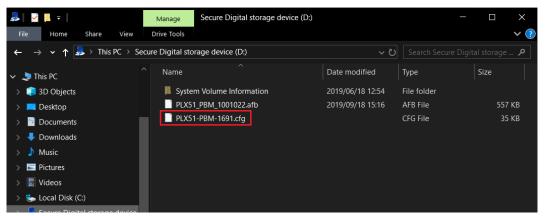


Figure 4.3 – SD Card – Configuration file

4.2.1 Manual Copy

Once the user has created the needed application configuration in the PLX50CU the configuration can be exported to a file that can be used on the SD Card. Once the file has been created the user can copy this file into the root directory of the SD Card.



Figure 4.4 – Configuration Export for SD Card

| 🚸 Select a PLX50 Devi | ice Config Export File | × |
|---|---|--------|
| $\leftarrow \rightarrow \land \uparrow$ | « Users > user > Documents > ProSoft Technology > ひ Search ProSoft Technology | م |
| Organise 🕶 New | folder 📰 🔻 | ? |
| 🔳 This PC | Name Date modified Type Size | |
| 🗊 3D Objects | No items match your search. | |
| 💻 Desktop | | |
| Documents | | |
| 🖊 Downloads | | |
| 🁌 Music | | |
| Nictures | | |
| Videos | | |
| 🈓 Local Disk (C:) | | |
| 鼻 Secure Digital | st | |
| | ✓ < | > |
| File name: | PLX51-PBM-EA1B.cfg | \sim |
| Save as type: | PLX50 Device Config Export (*.cfg) | ~ |
| | | |
| ∧ Hide Folders | Save Cancel | |

Figure 4.5 – Configuration Export for SD Card

IMPORTANT: The filename of the configuration file must not be changed. The specific module will use only the configuration that is valid (e.g. the PLX51-PBM will only use the PBM configuration file).

IMPORTANT: If more than one configuration file, with different configuration signatures, of the same product is on the SD Card then only the last configuration will be used.

4.2.2 PLX50CU Upload

When the SD Card has been inserted into the module and the user is online with the module in PLX50CU, then the user has the option to directly upload the configuration on to the SD Card using the *Save Configuration to SD Card* option. This will copy the configuration that has been downloaded to the module directly to the SD Card without the need to remove it from the module and inserted into a PC.

IMPORTANT: All other configuration files in the SD Card root directory will be deleted when the upload is done.

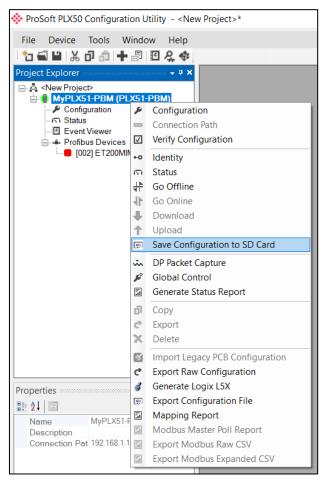


Figure 4.6 – Save Configuration to SD Card

5 Operation

5.1 Logix Operation

When the PLX51-PBM has been configured for Logix communication (by setting the Primary Interface to EtherNet/IP) it will exchange data with a Logix controller (e.g. ControlLogix or CompactLogix) by adding the PLX51-PBM module under an Ethernet bridge in the IO tree and establishing a Class 1 connection.

5.1.1 PROFIBUS DP - Master

Once the PLX51-PBM and Logix controller have been correctly configured, the PLX51-PBM will start exchanging data with PROFIBUS slave devices.

IMPORTANT: The module input and output assembly of each connection will be an undecorated array of data. The imported Logix routine (generated by PLX50CU) will copy this data to the input and output assemblies.

Master Status

Below are the definitions for the tags in the Master Status UDT created by the PLX50CU.

| MyPLX51PBM_MasterStatus | {} | {} | | PSPLX51DPMasterStatus |
|--|---------|----|---------|-----------------------|
| MyPLX51PBM_MasterStatus.ConfigValid | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.Owned | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.DuplicateDPStation | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusFieldbusError | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusDeviceError | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusOffline | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusStopped | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusClear | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ProfibusOperational | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.SlaveMode | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.PLCRun | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterStatus.ConfigCRC | 16#741a | | Hex | INT |
| MyPLX51PBM_MasterStatus.ActiveNodeCount | 3 | | Decimal | SINT |
| MyPLX51PBM_MasterStatus.DeviceLiveList | {} | {} | Decimal | BOOL[128] |
| MyPLX51PBM_MasterStatus.DeviceDataExchangeActive | {} | {} | Decimal | BOOL[128] |
| MyPLX51PBM_MasterStatus.DeviceAlarmPendingFlags | {} | {} | Decimal | BOOL[128] |
| MyPLX51PBM_MasterStatus.DeviceDiagnosticPendingFlags | {} | {} | Decimal | BOOL[128] |

Figure 5.1 – Logix Master Status tags

| Table 5.1 - Logix | Master Status tags |
|-------------------|--------------------|
|-------------------|--------------------|

| Тад | Description |
|-------------|--|
| ConfigValid | Configuration has been downloaded to the PLX51-PBM and is being executed. |
| | 1 – PLX51-PBM has been successfully configured. |
| | 0 – PLX51-PBM is not configured. |
| Owned | Indicates if the PLX51-PBM is owned by a Logix Controller with a connection count similar to what has been configured in PLX50CU. 1 – PLX51-PBM is connected. |
| | 0 – PLX51-PBM is not connected. |

| DuplicateDPStation | Indicates that the PLX51-PBM has detected another PROFIBUS DP station with the same station address as itself and has entered a temporary Back-off mode. 1 – Duplicate detected (Back-off mode active). 0 – Normal (No duplicate detected). NOTE: In this condition the PLX51-PBM will not communicate on the PROFIBUS DP network. Although the back-off time is approximately 5 seconds, should the conflicting DP master remain active on the PROFIBUS network, the PLX51-PBM will continuously re-enter the back-off mode. |
|-----------------------|--|
| PROFIBUSFieldbusError | There is a PROFIBUS network issues (e.g. cable unplugged, under/over terminated, etc.). 1 – Fieldbus error detected. 0 – Normal (No errors detected). |
| PROFIBUSDeviceError | At least one slave device has a communication issue (e.g. offline, not exchanging process data, etc.) 1 – Device error detected. 0 – Normal (No errors detected). |
| PROFIBUSOffline | The PROFIBUS network is offline and the PLX51-PBM will not communicate on the network. 1 – PROFIBUS fieldbus state is OFFLINE. 0 – PROFIBUS fieldbus state is not OFFLINE. |
| PROFIBUSStopped | The PROFIBUS network is running and the PLX51-PBM is communicating on the network, but it will not exchange any process data with any slave device. 1 – PROFIBUS fieldbus state is STOPPED. 0 – PROFIBUS fieldbus state is not STOPPED. |
| PROFIBUSClear | The PROFIBUS network is running and the PLX51-PBM is communicating with all slave devices on the network, and if configured in the PLX51-PBM, the module will configure and exchange process data with each slave device. NOTE: In CLEAR mode the PLX51-PBM will not send any output data to any slave device. 1 – PROFIBUS fieldbus state is CLEAR. |
| PROFIBUSOperational | 0 – PROFIBUS fieldbus state is not CLEAR. The PROFIBUS network is running and the PLX51-PBM is communicating with all slave devices on the network, and if configured in the PLX51-PBM, the module will configure and exchange process data with each slave device. 1 – PROFIBUS fieldbus state is OPERATE. 0 – PROFIBUS fieldbus state is not OPERATE. |
| SlaveMode | When in Slave mode the PLX51-PBM will emulate multiple PROFIBUS Slave devices. This indicates when the PLX51-PBM is in Slave mode. 1 – The PLX51-PBM is in Slave Mode. 0 – The PLX51-PBM is not in Slave Mode. |
| ConfigCRC | The signature of the configuration currently executing on the module. |
| DeviceListList | Indicates the nodes that are online on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device is online and when the bit is off '0' the device is not on the PROFIBUS network. Bit 0 – Node 0 Online Bit 1 – Node 1 Online Bit 126 – Node 126 Online |

| DeviceDataExchangeActive | Indicates the nodes that are online and exchanging DPV0 data on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device is online and exchanging data and when the bit is off '0' the device is not exchanging data on the PROFIBUS network. Bit 0 – Node 0 Exchanging DPV0 Data Bit 1 – Node 1 Exchanging DPV0 Data Bit 126 – Node 126 Exchanging DPV0 Data |
|------------------------------|---|
| DeviceAlarmPendingFlags | Indicates the nodes that have an alarm pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. Bit 0 – Node 0 has an alarm pending Bit 1 – Node 1 has an alarm pending Bit 126 – Node 126 has an alarm pending |
| DeviceDiagnosticPendingFlags | Indicates the nodes that have diagnostics pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. Bit 0 – Node 0 has diagnostics pending Bit 1 – Node 1 has diagnostics pending Bit 126 – Node 126 has diagnostics pending |

Master Control

The user will need to set the PROFIBUS Operating mode from the PLX51-PBM Logix output assembly in the Logix controller.

| MyPLX51PBM_MasterControl | {} | $\{\}$ | | PSPLX51DPMasterControl |
|--|----|--------|---------|------------------------|
| MyPLX51PBM_MasterControl.MasterControl | 3 | | Decimal | SINT |
| MyPLX51PBM_MasterControl.RedundancyControl | 0 | | Decimal | SINT |
| MyPLX51PBM_MasterControl.DeviceEnable | {} | {} | Decimal | BOOL[128] |
| MyPLX51PBM_MasterControl.DeviceEnable[0] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[1] | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[2] | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[3] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[4] | 1 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[5] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[6] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[7] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[8] | 0 | | Decimal | BOOL |
| MyPLX51PBM_MasterControl.DeviceEnable[9] | 0 | | Decimal | BOOL |

Figure 5.2 – Master Control tags

| Тад | Description |
|-------------------|--|
| MasterControl | This tag is used to set the state of the fieldbus network. |
| | 0 – Set PROFIBUS network state to OFFLINE |
| | 1 – Set PROFIBUS network state to STOP |
| | 2 – Set PROFIBUS network state to CLEAR |
| | 3 – Set PROFIBUS network state to OPERATIONAL |
| RedundancyControl | This field is currently reserved. |
| DeviceEnable | These bits enable nodes on the PROFIBUS network for data exchange. Each bit represents a node. When the specific bit is set '1' then the device (if configured) will exchange data with the PLX51-PBM and when the bit is off '0' the device does exchange data with the PLX51-PBM. |
| | Bit 0 – Node 0 is enabled for data exchange |
| | Bit 1 – Node 1 is enabled for data exchange |
| | Bit 126 – Node 126 is enabled for data exchange |

The user will be able to see if there are any faults (e.g. configured device not found) by viewing the LEDs of the PLX51-PBM (see the *Diagnostics* section for more details), by going online with the module in the PLX50 Configuration Utility and viewing the PLX51-PBM Master and Device Diagnostics, or by viewing the input assembly of the PLX51-PBM in Logix.

Status and DPV0 Data Exchange

The DPV0 data is exchanged with Logix using the Class 1 EtherNet/IP connection. The device-specific tag contains all the input and output data fields as well as important control and status information.

| ⊡ MyPLX51PBM1_iTEMPPATMT184 | {} | | MyPLX51PBM1_152365E6 |
|--|-----|---------|----------------------------|
| MyPLX51PBM1_iTEMPPATMT184.Input | {} | | MyPLX51PBM1_152365E6Input |
| HypLX51PBM1_iTEMPPATMT184.Input.Status | {} | | PSPLX51DPSIaveStatus |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.Online | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DataExchangeActive | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.IdentMismatch | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DisabledByOutputAssembly | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DeviceError | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.AlarmPending | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.DiagnosticsPending | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.OutputAssemblyNodeAddrMismatch | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.MappingCRCMismatch | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.SlaveClearOpMode | 0 | Decimal | BOOL |
| -MyPLX51PBM1_iTEMPPATMT184.Input.Status.SlaveAlarmAck | 0 | Decimal | BOOL |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.StationNumber | 0 | Decimal | SINT |
| MyPLX51PBM1_iTEMPPATMT184.Input.Status.DeviceMappingCRC | 0 | Decimal | INT |
| MyPLX51PBM1_iTEMPPATMT184.Input.TemperaturePV | 0.0 | Float | REAL |
| MyPLX51PBM1_iTEMPPATMT184.Input.TemperatureSts | 0 | Decimal | SINT |
| HMyPLX51PBM1_iTEMPPATMT184.Output | {} | | MyPLX51PBM1_152365E6Output |
| MyPLX51PBM1_iTEMPPATMT184.Output.Control | {} | | PSPLX51DPSIaveControl |
| MyPLX51PBM1_iTEMPPATMT184.Output.Control.StationNumber | 0 | Decimal | SINT |
| MyPLX51PBM1_iTEMPPATMT184.Output.Control.AlarmTrigger | 0 | Decimal | BOOL |
| HypLX51PBM1_iTEMPPATMT184.Output.Control.DeviceMappingCRC | 0 | Decimal | INT |
| -MyPLX51PBM1_iTEMPPATMT184.Output.DisplayValue | 0.0 | Float | REAL |
| MyPLX51PBM1_iTEMPPATMT184.Output.DisplayValueSts | 0 | Decimal | SINT |

Figure 5.3 – Slave Device-Specific tag

| Тад | Description |
|--------------------------|---|
| Status | |
| Online | This bit indicates if the device is online on the PROFIBUS network. |
| | 1 – Device is online |
| | 0 – Device is not online |
| DataExchangeActive | This bit indicates if the device is configured and exchanging data on the PROFIBUS network. |
| | 1 – Device is active and exchanging data |
| | 0 – Device is not exchanging data |
| | The user must ensure that all application code making use of data from a slave device first checks that the DataExchangeActive bit is 1. |
| IdentMismatch | The device configured in the PLX50CU and the device at the configured node address do not match because they have different ident numbers. |
| | 1 – Online device Ident does not match configured device |
| | 0 - Online device and configured device ident match |
| DisabledByOutputAssembly | This bit indicates if the device has not been enabled for data exchange in the PLX51-PBM device enable control bits. |
| | 1 – Device has not been enabled for data exchange |
| | 0 – Device has been enabled for data exchange |
| DeviceError | This bit indicates an error with the device. |
| | 1 – Device has an error. |
| | 0 – Device has no error. |

Table 5.3 – Device Input tags

| | The error flag will be set when one of the following conditions occur: |
|--------------------------------|---|
| | If there is an ident mismatch during slave parameterization, When receiving any form of FDL fault (data link layer fault). For example: SAP Not Activated or Resource Not Available. |
| | When the data size of the DPV0 data exchange does not match what has been configured in the PLX50CU. |
| | This Error flag is transient and will clear once a valid response is received. |
| AlarmPending | Indicates the device has an alarm pending on the local PROFIBUS network. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. 0 – The node has no alarm pending |
| | 1 – The node has an alarm pending |
| DiagnosticsPending | Indicates the device has diagnostics pending on the local PROFIBUS network. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. |
| | 0 – The node has no diagnostics pending |
| | 1 – The node has diagnostics pending |
| OutputAssemblyNodeAddrMismatch | This bit indicates that there is a mismatch between the actual device station address and the expected Logix mapping station address. 0 – Station address matches 1 – Station address mismatch |
| MappingCRCMismatch | If there is a mismatch in the mapping between Logix and the |
| Mappingerremismatch | PLX51-PBM it can result in data appearing in the incorrect location which means the user can be sending incorrect data to a device which can have unpredicted results. |
| | 0 – The mapping for the output data is correct |
| | 1 – There is a mapping mismatch in the output data |
| SlaveClearOpMode | When the PLX51-PBM is in Slave Mode ; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 – Slave Station is in CLEAR fieldbus mode 1 – Slave Station is not in CLEAR fieldbus mode |
| SlaveAlarmAck | |
| SlaveAlalmAck | When the PLX51-PBM is in Slave Mode ; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. |
| | 0 – Slave Station has received an Alarm Acknowledgement for last pending alarm |
| | No Alarm Acknowledgement have been received for a pending alarm or there is no alarm pending |
| StationNumber | The station number of the specific slave device. |
| DeviceMappingCRC | The checksum of the Mapping for the specific slave device. |
| DeviceSpecificInputDataFields | The tags created for the input data will be slave specific. |
| Tabl | e 5.4 – Device Output tags |
| Тад | Description |
| Control | |
| StationNumber | The station number entered by the Logix mapping code of the specific slave device. |
| AlarmTrigger | N/A. Slave Mode Only. |
| DeviceMappingCRC | The checksum of the mapping that was applied by the generated Logix code used to verify if the mapping being used is valid. |
| DeviceSpecificOutputDataFields | The tags created for the output data will be slave specific. |

DPV1 Explicit Messaging

The PLX51-PBM supports DPV1 Class 1 (MS1) and Class 2 (MS2) messaging which can be used to read / write parameters in a slave device. The PLX51-PBM DPV1 communication is achieved by using EtherNet/IP unconnected messaging (UCMM) or Class 3 connected messaging. The PLX51-PBM can buffer up to 10 DPV1 messages at a time.

NOTE: The slave device must support DPV1 messaging. The user must also set the DPV1 Enable bit in the user parameters of the slave device in the PLX50 Configuration Utility.

DPV1 Class 1 Messaging (MS1)

DPV1 Class 1 messaging will only be achievable if the slave device is in data exchange mode (i.e. the device is configured and exchanging cyclic data with the PLX51-PBM). Only the DP Master exchanging data with the slave device can read and write parameters using DPV1 MS1. Below are the EtherNet/IP CIP message parameters as well as the request and response data structures.

DPV1 Class 1 Read

CIP Message:

| Table 5.5 – DPV1 Class 1 Read Message | | |
|---------------------------------------|-------------|--|
| Parameter | Description | |
| Service Code | 0x4B (Hex) | |
| Class | 0x432 (Hex) | |
| Instance | 1 | |
| Attribute | N/A | |
| Request Data Length | 8 | |

Request Data:

| Parameter | Data Type | Description |
|---------------|-----------|---|
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Slave Address | Byte | The station number of the PROFIBUS device. |
| Slot Number | Byte | The DPV1 Slot number which must be read. |
| Index | Byte | The DPV1 Index number which must be read. |
| Data Length | Byte | The maximum number of bytes that must be read. |

Table 5.6 – DPV1 Class 1 Read Request

Response Data:

| Table 5.7 – DPV1 Class 1 | Read Response |
|--------------------------|---------------|
|--------------------------|---------------|

| Parameter | Data Type | Description |
|-----------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Data Length | Byte | The length of the data returned. |
| Reserved | Byte | - |
| Data | Byte[] | The data from the DPV1 Read request. The number of bytes will be equal to the Data Length in the response. |

DPV1 Class 1 Write

CIP Message:

Table 5.8 – DPV1 Class 1 Write Message

| Parameter | Description |
|---------------------|----------------------------|
| Service Code | 0x4C (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 8 + Length of Data Payload |

Request Data:

Table 5.9 - DPV1 Class 1 Write Request

| Parameter | Data Type | Description |
|---------------|-----------|---|
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Slave Address | Byte | The station number of the PROFIBUS device. |
| Slot Number | Byte | The DPV1 Slot number for the write request. |
| Index | Byte | The DPV1 Index number for the write request. |
| Data Length | Byte | The number of bytes that must be written. |
| Data | Byte[] | The data that will be written to the specific address. The number of bytes will be equal to the Data Length in the request. |

Response Data:

Table 5.10 – DPV1 Class 1 Write Response

| Parameter | Data Type | Description |
|-----------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Data Length | Byte | The length of the data that was written. |

DPV1 Class 2 Messaging (MS2)

DPV1 Class 2 messaging is possible from several DP masters simultaneously, but the connection must be established explicitly by each DP Master. Below are the EtherNet/IP CIP message parameters as well as the request and response data structures.

DPV1 Initialize (Establish Connection)

CIP Message:

| | 5 | | |
|---------------------|--|--|--|
| Parameter | Description | | |
| Service Code | 0x4D (Hex) | | |
| Class | 0x432 (Hex) | | |
| Instance | 1 | | |
| Attribute | N/A | | |
| Request Data Length | 20 + (2 + Source Net Address Length + Source MAC Address Length) + (2 + Destination Net Address Length + Destination MAC Address Length) | | |

Request Data:

Table 5.12 - DPV1 Class 2 Initialize Request

| Parameter | Data | Description |
|-------------------------------|--------------|---|
| Timeout | Type Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Slave Address | Byte | The station number of the PROFIBUS device. |
| Reserved | Byte[3] | - |
| Send Timeout | Short | The total time of the Class 2 connection. Time is based off 10ms. |
| Features Supported | Short | The services supported by the PLX51-PBM. Octet 1: Bit 0: This bit is set if the DPV1 Class 2 Read/Write services are supported by the PLX51-PBM. Bit 1-7: Reserved. Octet 2: Reserved. |
| Profile Features Supported | Short | The profile specific services supported by the PLX51-PBM. The meaning of the bits are vendor/profile specific. |
| Profile Ident Number | Short | This parameter defines a unique profile definition, independent from the Identity Number. If the requested profile is supported by the slave, it will be mirrored in the response. |
| Source Type | Byte | This indicates the use of an optional Network/MAC address (Source Type = 1) in the address information of the source. |
| Source Address Length | Byte | The total length of the address information of the source. The source address includes the: Source API, Source SCL, and an optional Source Network/MAC Address. |
| Destination Type | Byte | This indicates the use of an optional Network/MAC address (Destination Type = 1) in the address information of the destination. |
| Destination Address Length | Byte | The total length of the address information of the destination. The destination address includes the: Destination API, Destination SCL, and an optional Destination Network/MAC Address. |
| Source API | Byte | The application process instance of the source. |
| Source SCL | Byte | The access level of the source (0 = no access level used). |

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| Source Net Address | Byte[6] | The network address of the source (optional). |
|-------------------------|---------|---|
| Source MAC Address | Byte[] | The MAC address of the source (optional). |
| Destination API | Byte | The application process instance of the destination. |
| Destination SCL | Byte | The access level of the destination (0 = no access level used). |
| Destination Net Address | Byte[6] | The network address of the destination (optional). |
| Destination MAC Address | Byte[] | The MAC address of the destination (optional). |
| | | |

Response Data:

Table 5.13 – DPV1 Class 2 Initialize Response

| Parameter | Data Type | Description |
|-------------------------------|--------------|---|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Send Timeout | Short | Timeout time for Class 2 connection in ms. |
| Features Supported | Short | |
| Profile Features Supported | Short | Refer to the <i>PROFIBUS</i> – <i>DP Extensions to EN 50170 (DPV1)</i> for information regarding these parameters. |
| Profile Ident Number | Short | |
| Connection Reference | Byte | The connection reference is a reference number that must be used for further communication on this connection (e.g. Read, Write, or Abort). |

DPV1 Class 2 Abort

CIP Message:

| Parameter | Description |
|---------------------|-------------|
| Service Code | 0x4E (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 7 |

Request Data:

| Parameter | Data Type | Description |
|----------------------|-----------|---|
| Reserved | Long | - |
| Connection Reference | Byte | Connection Reference Received from the DPV1 Class 2 Initialize Response. |
| Subnet | Byte | Location of the source of the abort request. (0 = NO, 1 = SUBNET-LOCAL, 2 = SUBNET-REMOTE, 3-255 = Reserved) |
| Instance Reason Code | Byte | The Instance indicates the protocol instance that detected a problem in the abort request (FDL, MSAC_C2, USER). The Reason Code indicates the reason for the abort request. Refer to the <i>PROFIBUS – DP Extensions to EN 50170</i> (<i>DPV1</i>) for more information regarding this parameter. |

Response Data:

| Table 5.16 – DPV | Class 2 Abort | Response |
|------------------|---------------|----------|
|------------------|---------------|----------|

| Parameter | Data Type | Description |
|-----------|-----------|-------------|
| None | - | - |

DPV1 Class 2 Read

CIP Message:

Table 5.17 – DPV1 Class 2 Read Message

| Parameter | Description |
|---------------------|-------------|
| Service Code | 0x4F (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 8 |

Request Data:

| Table 5.18 – DPV1 Class 2 Read Request | | |
|--|-----------|---|
| Parameter | Data Type | Description |
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Connection Reference | Byte | Connection Reference Received from the DPV1 Class 2 Initialize Response. |
| Slot Number | Byte | The DPV1 Slot number which must be read. |
| Index | Byte | The DPV1 Index number which must be read. |
| Data Length | Byte | The maximum number of bytes that must be read. |

Response Data:

Table 5.19 – DPV1 Class 2 Read Response

| Parameter | Data Type | Description |
|-----------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Data Length | Byte | The length of the data returned. |
| Reserved | Byte | - |
| Data | Byte[] | The data from the DPV1 Read request. The number of bytes will be equal to the Data Length in the response. |

DPV1 Class 2 Write

CIP Message:

Table 5.20 – DPV1 Class 2 Write Message

| | 5 |
|---------------------|----------------------------|
| Parameter | Description |
| Service Code | 0x50 (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 8 + Length of Data Payload |

Request Data:

| Parameter | Data Type | Description |
|----------------------|-----------|---|
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Connection Reference | Byte | Connection Reference Received from the DPV1 Class 2 Initialize Response. |
| Slot Number | Byte | The DPV1 Slot number for the write request. |
| Index | Byte | The DPV1 Index number for the write request. |
| Data Length | Byte | The number of bytes that must be written. |
| Data | Byte[] | The data that will be written to the specific address. The number of bytes will be equal to the Data Length in the request. |

Table 5.21 - DPV1 Class 2 Write Request

Response Data:

Table 5.22 - DPV1 Class 2 Write Response

| Parameter | Data Type | Description |
|-----------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Data Length | Byte | The length of the data that was written. |

PROFIBUS Diagnostics

The PLX51-PBM will flag to the user when new diagnostics have been received. When new diagnostics have been flagged by the PLX51-PBM the user can extract the diagnostics message from the PLX51-PBM by using EtherNet/IP unconnected messaging (UCMM) or Class 3 connected messaging.

Notification

The PLX51-PBM will notify the user of pending diagnostics as shown below.

Master UDT

In the Status part of the PLX51-PBM tags (see *Logix Mapping* section) there is a tag FieldDeviceDiagPending. This is an array of Boolean tags each of which represents a node on the network. Below is a description of the tag.

| Тад | Description |
|------------------------|--|
| FieldDeviceDiagPending | Indicates the nodes that have diagnostics pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. Bit 0 – Node 0 has diagnostics pending Bit 1 – Node 1 has diagnostics pending Bit 126 – Node 126 has diagnostics pending |

Table 5.23 – PLX51-PBM Logix Tags Diagnostics Pending Indications

Field Device UDT

In the Status part of the Device UDT (see *Logix Mapping* section) there is a tag DiagnosticsPending. Below is a description of the tag.

| Table 5.24 – PLX51-PBM UDT Diagnostics Pending Indications | | |
|--|---|--|
| Тад | Description | |
| DiagnosticsPending | Indicates the device has diagnostics pending on the local PROFIBUS network. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. 0 – The node has diagnostics pending 1 – The node has diagnostics pending | |

Table 5.24 – PLX51-PBM UDT Diagnostics Pending Indications

Extraction

The user can extract diagnostics by using the slave device node address. The user can also decide how the diagnostics data must be extracted. This is changed by updating the mode in the Diagnostics Request message. There are one of three modes that can be selected:

| Mode | Description |
|------|--|
| 0 | Read the slave device diagnostics that has been buffered in the PLX51-PBM. |
| 1 | Read the slave device diagnostics that has been buffered in the PLX51-PBM and clear the Diagnostics Pending indication. |
| 2 | Force the PLX51-PBM to send a PROFIBUS Diagnostic Request to the specific slave device and return the diagnostics data received. |

Table 5.25 – Diagnostics Extract Message

CIP Message

Below are the EtherNet/IP CIP message parameters as well as the request and response data structures.

| Parameter | Description |
|---------------------|-------------|
| Service Code | 0x52 (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 6 |

Table 5.26 – Diagnostics Extract Message

Request Data:

| Table 5.27 – Diagnostics | Extract | Request |
|--------------------------|---------|---------|
|--------------------------|---------|---------|

| Parameter | Data Type | Description |
|---------------|-----------|---|
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Slave Address | Byte | The station number of the PROFIBUS device. |
| Mode | Byte | 0 – Read the slave device diagnostics that has been buffered in the PLX51-PBM. |
| | | 1 – Read the slave device diagnostics that has been buffered in the PLX51-PBM and clear the Diagnostics Pending indication. |
| | | 2 – Force the PLX51-PBM to send a PROFIBUS Diagnostic Request to the specific slave device and return the diagnostics data received. |

Response Data:

| Table 5.28 – Diagnostics | Extract Response |
|--------------------------|------------------|
|--------------------------|------------------|

| Parameter | Data Type | Description |
|-------------------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Reserved | Byte | - |
| Diagnostics data length | Byte | The number of diagnostic bytes that have been returned. |
| Reserved | Byte | - |
| Diagnostics Data | Byte[] | Refer to the <i>PROFIBUS Specification EN 50170</i> for information regarding the diagnostics. |

Global Control

Global control commands are multi-cast PROFIBUS commands which can be sent to a group of slave devices.

CIP Message

Below are the EtherNet/IP CIP message parameters as well as the request and response data structures.

| Table 5.29 – Global Control Message | | |
|-------------------------------------|-------------|--|
| Parameter | Description | |
| Service Code | 0x54 (Hex) | |
| Class | 0x432 (Hex) | |
| Instance | 1 | |
| Attribute | N/A | |
| Request Data Length | 6 | |

Request Data:

| Table 5.30 – Global Control Request | | |
|-------------------------------------|-----------|---|
| Parameter | Data Type | Description |
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Control | Byte | The Global Control action: 0 - Release the Clear mode for the devices 2 - Force the Clear Mode of devices 4 - Freeze 8 - UnFreeze 12 - UnFreeze + 16 - Sync + 32 - UnSync + 48 - UnSync |
| Group | Byte | The destination Group. |

Response Data:

Table 5.31 – Global Control Response

| Parameter | Data Type | Description |
|-----------|-----------|---|
| Status | Byte | This is the status of the Global Control transmission: 0x00 – Success 0x13 – Failed |

<u>Alarming</u>

The PLX51-PBM will flag to the user when a new alarm has been received. When a new alarm has been flagged by the PLX51-PBM the user can extract the alarm from the PLX51-PBM by using EtherNet/IP unconnected messaging (UCMM) or Class 3 connected messaging.

NOTE: If there is more than one alarm pending then after extract the alarm the alarm pending will be set again to indicate there are more alarms to unload.

Notification

The PLX51-PBM will notify the user of a pending alarm as shown below.

Master UDT

In the Status part of the PLX51-PBM tags (see *Logix Mapping* section) there is a tag FieldDeviceAlarmPending. This is an array of Boolean tags each of which represents a node on the network. Below is a description of the tag.

| Тад | Description |
|-------------------------|--|
| FieldDeviceAlarmPending | Indicates the nodes that have an alarm pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. |
| | Bit 0 – Node 0 has an alarm pending |
| | Bit 1 – Node 1 has an alarm pending |
| | Bit 126 – Node 126 has an alarm pending |

Table 5.32 – PLX51-PBM Tag Alarm Pending Indications

Field Device UDT

In the Status part of the Device UDT (see *Logix Mapping* section) there is a tag AlarmPending. Below is a description of the tag.

| Table 5.33 – Field Device UDT Alarm Pending Indications |
|---|
|---|

| Тад | Description |
|--------------|---|
| AlarmPending | Indicates the device has an alarm pending on the local PROFIBUS network. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. 0 – The node has an alarm pending 1 – The node has an alarm pending |

Extraction

CIP Message

The user can extract an alarm by using the slave device node address. Below are the EtherNet/IP CIP message parameters as well as the request and response data structures.

| Parameter | Description |
|---------------------|-------------|
| Service Code | 0x51 (Hex) |
| Class | 0x432 (Hex) |
| Instance | 1 |
| Attribute | N/A |
| Request Data Length | 5 |

Request Data:

| Parameter | Data Type | Description |
|---------------|-----------|---|
| Timeout | Long | The amount of time (in milliseconds) the PLX51-PBM waits for a DPV1 response before timing out and responding to the EtherNet/IP request with a Timeout Status. |
| Slave Address | Byte | The station number of the PROFIBUS device. |
| | | |

Response Data:

Table 5.36 – Alarm Extract Response

| Parameter | Data Type | Description |
|-------------------|-----------|--|
| Status | Byte | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Extended Status | Byte[3] | This is the extended status of the DPV1 data exchange. See appendix for the definitions of the returned extended status. |
| Alarm data length | Byte | The amount of alarm bytes that have been returned. |
| Alarm data | Byte[] | Refer to the <i>PROFIBUS Specification EN 50170</i> for information regarding the diagnostics. |
| | | Below is the basic structure of the alarm data: |
| | | Byte 0 – Alarm Type |
| | | 1 – Diagnosis Alarm |
| | | 2 – Process Alarm |
| | | 3 – Pull Alarm |
| | | 4 – Plug Alarm |
| | | 5 – Status Alarm |
| | | 6 – Update Alarm |
| | | Byte 1 – Slot Number |
| | | Range 0 - 254 |
| | | Byte 2 - Bit 0 to 1 – Alarm Specifier |
| | | 0 – No further differentiation |
| | | 1 – Fault occurred and slot it not ok |
| | | 2 – Fault disappeared, and slot is ok |
| | | 3 – One fault disappeared, and slot is not ok |
| | | Byte 2 - Bit 3 to 7 – Sequence Number |
| | | Range 1 - 32 |
| | | Byte 3 to 59 – Alarm Data Description |

5.1.2 PROFIBUS DP - Slave

IMPORTANT: The module input and output assembly of each connection will be an undecorated array of data. The imported Logix routine (generated by PLX50CU) will copy this data to the structed input and output assemblies.

General Status

Below are the definitions for the tags in the General Status UDT created by the PLX50CU.

| MyPLX51PBM1_GeneralStatus | {} {. | PSPLX51DPGeneralStatus |
|--|---------------|------------------------|
| MyPLX51PBM1_GeneralStatus.ConfigValid | 1 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.Owned | 1 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.DuplicateDPStation | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusFieldbusError | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusDeviceError | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusOffline | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusStopped | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusClear | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ProfibusOperational | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.SlaveMode | 1 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.PLCRun | 0 Decimal | BOOL |
| MyPLX51PBM1_GeneralStatus.ConfigCRC | 16#347c Hex | INT |
| MyPLX51PBM1_GeneralStatus.ActiveNodeCount | 1 Decimal | SINT |
| MyPLX51PBM1_GeneralStatus.DeviceLiveList | {} {. Decimal | BOOL[128] |
| MyPLX51PBM1_GeneralStatus.DeviceDataExchangeActive | {} {. Decimal | BOOL[128] |
| MyPLX51PBM1_GeneralStatus.DeviceAlarmPendingFlags | {} {. Decimal | BOOL[128] |
| MyPLX51PBM1_GeneralStatus.DeviceDiagnosticPendingFlags | {} {. Decimal | BOOL[128] |

Figure 5.4 – Logix General Status tags

| Тад | Description |
|-----------------------|--|
| ConfigValid | Configuration has been downloaded to the PLX51-PBM and is being executed. |
| | 1 – PLX51-PBM has been successfully configured. |
| | 0 – PLX51-PBM is not configured. |
| Owned | Indicates if the PLX51-PBM is owned by a Logix Controller with a connection count similar to what has been configured in PLX50CU. 1 – PLX51-PBM is connected. |
| | 0 - PLX51 - PBM is not connected. |
| DuplicateDPStation | N/A. Master Mode Only. |
| PROFIBUSFieldbusError | There is a PROFIBUS network issues (e.g. cable unplugged, under/over terminated, etc.). 1 – Fieldbus error detected. |
| | 0 – Normal (No errors detected). |
| PROFIBUSDeviceError | At least one slave device has a communication issue (e.g. offline, not exchanging process data, etc.) |
| | 1 – Device error detected. |
| | 0 – Normal (No errors detected). |
| PROFIBUSOffline | N/A. Master Mode Only. |
| PROFIBUSStopped | N/A. Master Mode Only. |
| PROFIBUSClear | N/A. Master Mode Only. |
| PROFIBUSOperational | N/A. Master Mode Only. |
| SlaveMode | When in Slave mode the PLX51-PBM will emulate multiple PROFIBUS Slave devices. When configured to interface to Modbus the PLX51-PBM will be a Modbus Master. |

Table 5.37 – Logix General Status tags

| | 1 – The PLX51-PBM is in Slave Mode. |
|------------------------------|--|
| | 0 – The PLX51-PBM is not in Slave Mode. |
| ConfigCRC | The signature of the configuration currently executing on the module. |
| DeviceListList | Indicates the nodes that are online on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device is online and when the bit is off '0' the device is not on the PROFIBUS network. Bit 0 – Node 0 Online Bit 1 – Node 1 Online Bit 126 – Node 126 Online |
| DeviceDataExchangeActive | Indicates the nodes that are online and exchanging DPV0 data on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device is online and exchanging data and when the bit is off '0' the device is not exchanging data on the PROFIBUS network. Bit 0 – Node 0 Exchanging DPV0 Data Bit 1 – Node 1 Exchanging DPV0 Data Bit 126 – Node 126 Exchanging DPV0 Data |
| DeviceAlarmPendingFlags | Indicates the nodes that have an alarm pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. Bit 0 – Node 0 has an alarm pending Bit 1 – Node 1 has an alarm pending Bit 126 – Node 126 has an alarm pending |
| DeviceDiagnosticPendingFlags | Indicates the nodes that have diagnostics pending on the local PROFIBUS network. Each bit represents a node. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. Bit 0 – Node 0 has diagnostics pending Bit 1 – Node 1 has diagnostics pending |

General Control

The PLX51-PBM in Slave mode will operate similar to when in Master mode, but each configured Slave will be enabled by setting the correct enable bit in either the Logix output assembly. Once the respective bit has been set in the DeviceEnable BOOL array the PLX51-PBM will become "alive" on the PROFIBUS network and will start responding to a PROFIBUS DP Master.

| MyPLX51PBM1_GeneralControl | {} {. | | | P | SPLX51DPGeneralControl |
|--|-------|------|---------|---|-------------------------|
| MyPLX51PBM1_GeneralControl.MasterControl | 0 | De | ecimal | S | INT |
| MyPLX51PBM1_GeneralControl.RedundancyControl | 0 | De | ecimal | S | INT |
| MyPLX51PBM1_GeneralControl.DeviceEnable | {} {. | De | ecimal | В | OOL[128] |
| MyPLX51PBM1_GeneralControl.DeviceEnable[0] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[1] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[2] | 1 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[3] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[4] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[5] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[6] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl.DeviceEnable[7] | 0 | De | ecimal | В | OOL |
| MyPLX51PBM1_GeneralControl | {] | } {. | | | PSPLX51DPGeneralControl |
| MyPLX51PBM1_GeneralControl.MasterControl | C |) | Decimal | | SINT |
| MyPLX51PBM1_GeneralControl.RedundancyControl | (|) | Decimal | | SINT |
| MyPLX51PBM1_GeneralControl.DeviceEnable | {] | } {. | Decimal | | BOOL[128] |

Figure 5.5 – General Control tags

| | Table 5.38 – General Control tags |
|-------------------|---|
| Тад | Description |
| MasterControl | N/A. Master Mode Only. |
| RedundancyControl | Reserved. |
| DeviceEnable | These bits enable nodes on the PROFIBUS network for data exchange. Each bit represents a node. When the specific bit is set '1' then the device (if configured) will exchange data with the PLX51-PBM and when the bit is off '0' the device does exchange data with the PLX51-PBM. Bit 0 – Node 0 is enabled for data exchange Bit 1 – Node 1 is enabled for data exchange Bit 126 – Node 126 is enabled for data exchange |

The user will be able to see if there are any faults (e.g. configured device not found) by viewing the LEDs of the PLX51-PBM (see the *Diagnostics* section for more details), by going online with the module in the PLX50 Configuration Utility and viewing the PLX51-PBM Slave and Device Diagnostics, or by viewing the input assembly of the PLX51-PBM Slave in Logix.

Status and DPV0 Data Exchange

The DPV0 data is exchanged with Logix using the Class 1 EtherNet/IP connection. The device-specific tag contains all the input and output data fields as well as important control and status information.

| ▲ MyPLX51PBM1_PLX51PBM | {} | {} | | MyPLX51PBM1_10FE0207 |
|---|---------|----|---------|---------------------------|
| ▲ MyPLX51PBM1_PLX51PBM.Input | {} | {} | | MyPLX51PBM1_10FE0207Input |
| MyPLX51PBM1_PLX51PBM.Input.Status | {} | {} | | PSPLX51DPSIaveStatus |
| MyPLX51PBM1_PLX51PBM.Input.Status.Online | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DataExchangeActive | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.IdentMismatch | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DisabledByOutputAssembly | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DeviceError | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.AlarmPending | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DiagnosticsPending | 0 | | Decimal | BOOL |
| $MyPLX51PBM1_PLX51PBM.Input.Status.OutputAssemblyNodeAddrMismatch$ | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.MappingCRCMismatch | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.SlaveClearOpMode | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.SlaveAlarmAck | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.StationNumber | 2 | | Decimal | SINT |
| MyPLX51PBM1_PLX51PBM.Input.Status.DeviceMappingCRC | 16#347c | | Hex | INT |
| MyPLX51PBM1_PLX51PBM.Input.Output16Bytes | {} | {} | Decimal | SINT[16] |
| MyPLX51PBM1_PLX51PBM.Input.Output16Bytes1 | {} | {} | Decimal | SINT[16] |
| MyPLX51PBM1_PLX51PBM.Input.Output16Bytes2 | {} | {} | Decimal | INT[8] |
| MyPLX51PBM1_PLX51PBM.Output | {} | {} | | MyPLX51PBM1_10FE0207Outpu |
| MyPLX51PBM1_PLX51PBM.Output.Control | {} | {} | | PSPLX51DPSIaveControl |
| MyPLX51PBM1_PLX51PBM.Output.Control.StationNumber | 2 | | Decimal | SINT |
| MyPLX51PBM1_PLX51PBM.Output.Control.AlarmTrigger | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Output.Control.DeviceMappingCRC | 16#347c | | Hex | INT |
| MyPLX51PBM1_PLX51PBM.Output.Input16Bytes | {} | {} | Decimal | SINT[16] |
| MyPLX51PBM1_PLX51PBM.Output.Input16Bytes1 | {} | {} | Decimal | SINT[16] |
| MyPLX51PBM1_PLX51PBM.Output.Input16Bytes2 | {} | {} | Decimal | INT[8] |

Figure 5.6 – PLX51-PBM Slave Device-Specific tag

| Table 5.39 – Device Input | tags |
|---------------------------|------|
|---------------------------|------|

| Тад | Description | |
|--------------------|---|--|
| Status | | |
| Online | This bit indicates if the device is online on the PROFIBUS network. | |
| | 1 – Device is online | |
| | 0 – Device is not online | |
| DataExchangeActive | This bit indicates if the device is configured and exchanging data on the PROFIBUS network. | |
| | 1 – Device is active and exchanging data | |
| | 0 – Device is not exchanging data | |
| | | |
| | The user must ensure that all application code making use of data from a slave device first checks that the DataExchangeActive bit is 1. | |
| IdentMismatch | The device configured in the PLX50CU and the device at the configured node address do not match because they have different ident numbers. | |
| | 1 – Online device Ident does not match configured device | |
| | 0 – Online device and configured device ident match | |

| DisabledByOutputAssembly | This bit indicates if the device has not been enabled for data exchange in the PLX51-PBM device enable control bits. |
|-----------------------------------|--|
| | 1 – Device has not been enabled for data exchange |
| | 0 – Device has been enabled for data exchange |
| DeviceError | This bit indicates an error with the device. |
| | 1 – Device has an error. |
| | 0 – Device has no error. |
| | The error flag will be set when one of the following conditions occur: |
| | If there is an ident mismatch during slave parameterization, |
| | When receiving any form of FDL fault (data link layer fault). For example: SAP Not Activated or Resource Not Available. |
| | When the data size of the DPV0 data exchange does not match what has been configured in the PLX50CU. |
| | This Error flag is transient and will clear once a valid response is received. |
| AlarmPending | Indicates the device has an alarm pending on the local PROFIBUS network. When the specific bit is set '1' then the device has an alarm pending that must be unloaded and when the bit is off '0' the device does not have an alarm pending. |
| | 0 – The node has no alarm pending |
| | 1 – The node has an alarm pending |
| DiagnosticsPending | Indicates the device has diagnostics pending on the local PROFIBUS network. When the specific bit is set '1' then the device has diagnostics pending that must be unloaded and when the bit is off '0' the device does not have any diagnostics pending. 0 – The node has no diagnostics pending |
| | 1 – The node has diagnostics pending |
| OutputAssemblyNodeAddrMismatch | This bit indicates that there is a mismatch between the actual device station address and the expected Logix mapping station address. 0 – Station address matches 1 – Station address mismatch |
| MappingCRCMismatch | If there is a mismatch in the mapping between Logix and the PLX51-PBM it can result in data appearing in the incorrect |
| | location which means the user can be sending incorrect data to a device which can have unpredicted results. 0 – The mapping for the output data is correct. 1 – There is a mapping mismatch in the output data. |
| SlaveClearOpMode | a device which can have unpredicted results. 0 – The mapping for the output data is correct. |
| SlaveClearOpMode SlaveAlarmAck | a device which can have unpredicted results. 0 - The mapping for the output data is correct. 1 - There is a mapping mismatch in the output data. When the PLX51-PBM is in Slave Mode; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 - Slave Station is in CLEAR fieldbus mode. 1 - Slave Station is not in CLEAR fieldbus mode. When the PLX51-PBM is in Slave Mode; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. 0 - Slave Station has received an Alarm Acknowledgement for |
| | a device which can have unpredicted results. 0 - The mapping for the output data is correct. 1 - There is a mapping mismatch in the output data. When the PLX51-PBM is in Slave Mode; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 - Slave Station is in CLEAR fieldbus mode. 1 - Slave Station is not in CLEAR fieldbus mode. When the PLX51-PBM is in Slave Mode; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. 0 - Slave Station has received an Alarm Acknowledgement for last pending alarm. 1 - No Alarm Acknowledgement have been received for a |
| SlaveAlarmAck | a device which can have unpredicted results. 0 - The mapping for the output data is correct. 1 - There is a mapping mismatch in the output data. When the PLX51-PBM is in Slave Mode; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 - Slave Station is in CLEAR fieldbus mode. 1 - Slave Station is not in CLEAR fieldbus mode. When the PLX51-PBM is in Slave Mode; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. 0 - Slave Station has received an Alarm Acknowledgement for last pending alarm. 1 - No Alarm Acknowledgement have been received for a pending alarm or there is no alarm pending. |
| SlaveAlarmAck | a device which can have unpredicted results. 0 - The mapping for the output data is correct. 1 - There is a mapping mismatch in the output data. When the PLX51-PBM is in Slave Mode; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 - Slave Station is in CLEAR fieldbus mode. 1 - Slave Station is not in CLEAR fieldbus mode. When the PLX51-PBM is in Slave Mode; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. 0 - Slave Station has received an Alarm Acknowledgement for last pending alarm. 1 - No Alarm Acknowledgement have been received for a pending alarm or there is no alarm pending. The station number of the specific slave device. |
| SlaveAlarmAck | a device which can have unpredicted results. 0 - The mapping for the output data is correct. 1 - There is a mapping mismatch in the output data. When the PLX51-PBM is in Slave Mode; this will indicate that the respective slave is in fieldbus CLEAR mode (received from the DP Master on the network). 0 - Slave Station is in CLEAR fieldbus mode. 1 - Slave Station is not in CLEAR fieldbus mode. When the PLX51-PBM is in Slave Mode; this will indicate that the respective emulated slave has received an acknowledgement for the pending alarm. 0 - Slave Station has received an Alarm Acknowledgement for last pending alarm. 1 - No Alarm Acknowledgement have been received for a pending alarm or there is no alarm pending. |

| Table 5.40 – Device Output tags | | | |
|---------------------------------|---|--|--|
| Tag Description | | | |
| Control | | | |
| StationNumber | The station number entered by the Logix mapping code of the specific slave device. | | |
| AlarmTrigger | When this bit is transitioned from 0 to 1 it will trigger an alarm notification to the DP Master. | | |
| DeviceMappingCRC | The checksum of the mapping that was applied by the generated Logix code used to verify if the mapping being used is valid. | | |
| DeviceSpecificOutputDataFields | The tags created for the output data will be slave specific. | | |

DPV1 Class 1 Messaging (MS1)

The PLX51-PBM supports DPV1 Class 1 (MS1) messaging when operating as a PROFIBUS Slave. See the DPV1 Objects in the PLX50 Configuration Utility device configuration section for more information regarding the configuration of the DPV1 Objects. The user can configure several slot and index combinations for DPV1 Class 1 communication (for each added PROFIBUS Slave device).

When the PROFIBUS Master sends a DPV1 read/write command for the configured slot and index, the PLX51-PBM will access the configured Logix tag to provide the required data. The data that will be written or read will be extracted from the Logix SINT array configured in the DPV1 objects of the device configuration window. Below is an example of the DPV1 operation when the PLX51-PBM has been configured as a PROFIBUS Slave.

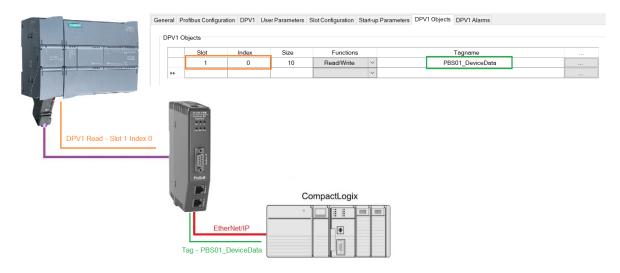


Figure 5.7 – PLX51-PBM DPV1 Object exchange

<u>Alarming</u>

The PLX51-PBM supports DPV1 Alarming when operating as a PROFIBUS Slave. The user can trigger an alarm from the Logix device output assembly which will notify the PROFIBUS Master that a new alarm has been generated. When the PROFIBUS Master sends a DPV1 alarm read command, the PLX51-PBM will access the configured Logix tag to provide the required data for the specific alarm.

NOTE: The PLX51-PBM can only allow one alarm to be triggered at a time.

To trigger an alarm notification for the PROFIBUS Master the user will need to toggle (from 0 to 1) the AlarmTrigger tag in the field device output assembly as shown below:

| ▲ MyPLX51PBM1_PLX51PBM | {} | {. | | MyPLX51PBM1_10FE |
|--|---------|----|---------|--------------------|
| MyPLX51PBM1_PLX51PBM.Input | {} | {. | | MyPLX51PBM1_10FE |
| MyPLX51PBM1_PLX51PBM.Output | {} | {. | | MyPLX51PBM1_10FE |
| MyPLX51PBM1_PLX51PBM.Output.Control | {} | {. | | PSPLX51DPSlaveCont |
| MyPLX51PBM1_PLX51PBM.Output.Control.StationNumber | 2 | | Decimal | SINT |
| MyPLX51PBM1_PLX51PBM.Output.Control.AlarmTrigger | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Output.Control.DeviceMappingCRC | 16#347c | | Hex | INT |

Figure 5.8 – PLX51-PBM Slave Alarm Trigger

Once the alarm has been triggered the PLX51-PBM will read the alarm data from the configured Logix tag and add it to the PROFIBUS diagnostics (which will then be read by the PROFIBUS Master).

When the PROFIBUS Master acknowledges the alarm the SlaveAlarmAck bit in the input assembly for the field device will be set indicating to the Logix controller that the next alarm can be triggered.

| MyPLX51PBM1_PLX51PBM.Input | {} | {} | | MyPLX51PBM1_10FE0207 |
|---|---------|----|---------|----------------------|
| MyPLX51PBM1_PLX51PBM.Input.Status | {} | {} | | PSPLX51DPSIaveStatus |
| MyPLX51PBM1_PLX51PBM.Input.Status.Online | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DataExchangeActive | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.IdentMismatch | 0 | | Decimal | BOOL |
| $MyPLX51PBM1_PLX51PBM.Input.Status.DisabledByOutputAssembly$ | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DeviceError | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.AlarmPending | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.DiagnosticsPending | 0 | | Decimal | BOOL |
| $MyPLX51PBM1_PLX51PBM.Input.Status.OutputAssemblyNodeAddrMismatch$ | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.MappingCRCMismatch | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.SlaveClearOpMode | 0 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.SlaveAlarmAck | 1 | | Decimal | BOOL |
| MyPLX51PBM1_PLX51PBM.Input.Status.StationNumber | 2 | | Decimal | SINT |
| MyPLX51PBM1_PLX51PBM.Input.Status.DeviceMappingCRC | 16#347c | | Hex | INT |

Figure 5.9 – PLX51-PBM Alarm Acknowledge

NOTE: An alarm will only be triggered when the AlarmTrigger tag is toggled from 0 to 1.

| | The format of the DPV | Alarm data in the | e Logix SINT arra | y is shown below: |
|--|-----------------------|-------------------|-------------------|-------------------|
|--|-----------------------|-------------------|-------------------|-------------------|

| Alarm Parameter | Byte Offset | Byte Size | Description |
|-----------------|-------------|--------------|--|
| Alarm Length | 0 | 1 | This is the length of the Alarm data at the bottom of the table. |
| Alarm Type | 1 | 1 | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. Below are some examples: 1 - Diagnosis_Alarm 3 - Pull_Alarm 4 - Plug_Alarm |
| Alarm Slot | 2 | 1 | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |
| Alarm Specifier | 3 | 1 | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. Below are some examples: 0 - no further differentiation 1 – Incident appeared 2 – Incident disappeared and slot is ok 3 - One incident disappeared, others remain |
| Alarm data | 4 | Alarm Length | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |

Table 5.41 – Slave Alarm Data Format

An example of the Alarm Data is shown below:

| Name = | ∎ ≁ Value 🔸 | Style | Data Type | Description |
|--------------|-------------|-------|-----------|-------------------|
| DPV1Alarm | { | Hex | SINT[40] | |
| DPV1Alarm[0] | 16#05 | Hex | SINT | Alarm Data Length |
| DPV1Alarm[1] | 16#01 | Hex | SINT | Alarm Type |
| DPV1Alarm[2] | 16#03 | Hex | SINT | Alarm Slot |
| DPV1Alarm[3] | 16#01 | Hex | SINT | Alarm Specifier |
| DPV1Alarm[4] | 16#11 | Hex | SINT | Alarm Data |
| DPV1Alarm[5] | 16#22 | Hex | SINT | |
| DPV1Alarm[6] | 16#33 | Hex | SINT | |
| DPV1Alarm[7] | 16#44 | Hex | SINT | |
| DPV1Alarm[8] | 16#55 | Hex | SINT | |
| DPV1Alarm[9] | 16#00 |) Hex | SINT | |

Figure 5.10 – DPV1 Alarm Data Example

Below are some basic definitions for certain alarm parameters:

| Parameter | Description | |
|------------------------------|---|--|
| | 1 – Diagnosis Alarm | |
| | 2 – Process Alarm | |
| | 3 – Pull Alarm | |
| Alarm Type | 4 – Plug Alarm | |
| | 5 – Status Alarm | |
| | 6 – Update Alarm | |
| Slot Number | Range: 0 to 254 | |
| | 0 – No further differentiation | |
| Alarm Specifier (Bit 0 to 1) | 1 – Fault occurred and slot it not ok | |
| | 2 – Fault disappeared, and slot is ok | |
| | 3 – One fault disappeared, and slot is not ok | |

5.2 Modbus Operation

When the PLX51-PBM has been setup for Modbus communication it will exchange data with a remote Modbus device. Depending on the Primary Interface selection, the PLX51-PBM will either function as a Modbus Master or Modbus Slave.

NOTE: When configured as a Modbus Slave the Modbus Master device will need to read and write all required data from the configured Modbus address ranges. When configured as a Modbus Master the PLX51-PBM will automatically update the required Modbus registers in the configured remote target.

5.2.1 PROFIBUS DP - Master

Once the PLX51-PBM and Modbus device have been correctly configured, the PLX51-PBM will start exchanging data with PROFIBUS slave devices. The user will need to set the PROFIBUS Operating mode from the relevant Modbus Mapping Register.

Master and Slave Device Status

The Master Control command is set in Holding (HR) registers starting at the **Master Control Register** offset.

| HR Offset Description | |
|-----------------------|---|
| | Master Control Command |
| 0 | 0 - Set PROFIBUS OFFLINE 1 - Set PROFIBUS STOP 2 - Set PROFIBUS CLEAR 3 - Set PROFIBUS OPERATIONAL |

| Table 5.42 - Modbus M | Master Control |
|-----------------------|----------------|
|-----------------------|----------------|

The Master and Slave Status is populated in either Coil (CS) or Holding (HR) registers starting at the **Status Register** offset.

| CS Offset | Description |
|--------------------------------|--|
| Master Status | |
| 0 | Configuration Valid |
| 1 | Owned |
| 2 | Duplicate DP Station |
| 3 | PROFIBUS Fieldbus Error |
| 4 | PROFIBUS Device Error |
| 5 | PROFIBUS OFFLINE |
| 6 | PROFIBUS STOPPED |
| 7 | PROFIBUS CLEAR |
| 8 | PROFIBUS OPERATIONAL |
| 9 | Master/Slave Mode (1 = Slave Mode) |
| 32 - 158 | Live List Flags (Station Address 0 - 126) |
| 160 - 286 | Data Exchange Flags (Station Address 0 - 126) |
| 288 - 414 | Alarm Pending Flags (Station Address 0 - 126) |
| 416 - 542 | Diagnostic Pending Flags (Station Address 0 - 126) |
| Slave Device Status | |
| 544 + (16 x [Station Address]) | Online |
| 545 + (16 x [Station Address]) | Data Exchange Active |

| 546 + (16 x [Station Address]) | Ident Mismatch |
|--------------------------------|--|
| 547 + (16 x [Station Address]) | Disabled by Output Assembly |
| 548 + (16 x [Station Address]) | Device Error |
| 549 + (16 x [Station Address]) | Alarm Pending |
| 550 + (16 x [Station Address]) | Diagnostics Pending |
| 551 + (16 x [Station Address]) | Output Assembly Station Address Mismatch |
| 552 + (16 x [Station Address]) | Mapping CRC Mismatch |
| 553 + (16 x [Station Address]) | Slave Clear Op Mode |
| 554 + (16 x [Station Address]) | Slave Alarm Ack |
| | |

The Slave Device Enable is located in either Coil (CS) or Holding (HR) registers starting at the Device Control Register offset.

| CS Offset | Description |
|-----------------------|---|
| Device Enable | |
| 0 + [Station Address] | Device Enable (Station Address 0 - 126) |

The Modbus Communication Status is located in Holding (HR) registers starting at the *Modbus Communication Status offset* configured in the *Modbus Addressing* tab.

Table 5.45 – Modbus Communication Status

| HR Offset | Description |
|----------------------------------|---|
| Modbus Communication Status when | operating as a Modbus Slave |
| | Bit 0 – PLX51-PBM Modbus Slave Communication Status |
| 0 | 1 – Modbus Communication Ok |
| | 0 – Modbus Communication Failed |
| Modbus Communication Status when | operating as a Modbus Master |
| | Bit 0 – Modbus Node 0 Communication Status |
| 1 | 1 – Modbus Communication Ok |
| | 0 – Modbus Communication Failed |
| | Bit 0 – Modbus Node 1 Communication Status |
| 2 | 1 – Modbus Communication Ok |
| | 0 – Modbus Communication Failed |
| | |
| | Bit 0 – Modbus Node 253 Communication Status |
| 254 | 1 – Modbus Communication Ok |
| | 0 – Modbus Communication Failed |
| | Bit 0 – Modbus Node 254 Communication Status |
| 255 | 1 – Modbus Communication Ok |
| | 0 – Modbus Communication Failed |

DPV0 Data Exchange

The DPV0 data exchange for each slave device is configured in the slot configuration.

Slot Configuration

| Slot | Description | Module | | | | Data Po | int | Data Typ | e | Byte Length | Registe Type | er | Modbus Offset | DP Offset | Ext User Prm |
|------|------------------|-------------------------|---------|-------|---|---------|--------|----------|--------|----------------|-----------------|----|------------------|--------------|-----------------|
| 1 | a6ES73271BH000AB | 138-6ES7 327-1BH00-0AB0 | 8DI/8DX | + | | Input | \sim | INT | \sim | 2 | HR | ~ | 2000 | 0 | 155F01001 |
| | a6ES73271BH000A1 | | | + | X | Output | \sim | INT | ~ | 2 | HR | ~ | 2001 | 0 | |

Figure 5.11 – Slave Device Slot configuration – Modbus

DPV1 Class 1 Messaging (MS1)

The user can exchange DPV1 Class 1 data with a field device using the configured Modbus Registers. The user will need to enable DPV1 Messages and set the required DPV1 Message HR Offset in the Modbus addressing tab of the Configuration window (see below).

| neral Modbus Modbus Addressin | 9 Profibus | Logix | Advanced | Modbus Auxiliary Map | EtherNet/IP Devices | EtherNet/IP Map |
|-------------------------------|-------------|-------|----------|----------------------|---------------------|-----------------|
| Modbus Addressing | | | | | | |
| Base Offset Type | Modbus (Bas | e 0) | \sim | | | |
| REAL / DINT Format | AA BB CC DI |) | \sim | Master | Control | |
| Master Control Register | HR | 0 | | Slave [| Device Enables | |
| Status Register | cs v | 0 | | Slave [| Device Control | |
| Device Control Register | cs v | 409 | 6 | | | |
| DPV0 Diagnostic Register | HR | 0 | | | Diagnostic Enable | |
| DPV1 Message Register | HR | 0 | | | Message Enable | |
| DPV1 Alarm Register | HR | 0 | | DPV1 / | Narm Enable | |
| Modbus Communication Status | HR | 0 | | | | |

Figure 5.12 – DPV1 Message Holding Register parameters

The user will need to setup the required messaging parameters in the Holding Register fields and then set the trigger bit to enable the DPV1 Message transaction to begin. Once the transaction is complete the response part of the Holding Registers will be updated.

NOTE: The user will need to toggle the trigger Holding Register from 0 to 1 before the transaction will begin.

Below is the format of the Holding Registers used for DPV1 Class 1 Messaging.

Table 5.46 – Modbus DPV1 Class 1 Request Message Holding Register Format

| DPV1 Request | Holding Register Offset | Description |
|---------------|----------------------------|--|
| Trigger | 0 | Bit 0 – Trigger Message Send |
| Timeout | 1 | The time in Milliseconds if no response has been received before the transaction times out |
| Slave Address | 2 | Target PROFIBUS Slave node address |
| Function | 3 | 0 – Read 1 – Write |
| Data Size | 4 | Size of the data to follow |
| Data | 5 | Request data (eg. Slot, Index, Size, and Data) |

Table 5.47 – Modbus DPV1 Class 1 Response Message Holding Register Format

| DPV1 Response | Holding Register Offset | Description |
|---------------|----------------------------|--|
| Response Size | 128 | Size of all bytes following |
| Status | 129 | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Reserved | 130 | |
| Data Size | 131 | The size of the data to follow. |
| Data | 132 | The response data |

PROFIBUS Diagnostics

The user can extract the PROFIBUS Diagnostics from a field device using the configured Modbus Registers. The user will need to enable DPV0 Diagnostic and set the required DPV0 Diagnostic HR Offset in the Modbus addressing tab of the Configuration window (see below).

| eneral Modbus Modbus Addressing | Profibus [| Logix Advanced | Modbus Auxiliary Map | EtherNet/IP Devices | EtherNet/IP Map |
|---------------------------------|-------------|----------------|----------------------|---------------------|-----------------|
| Modbus Addressing | | | | | |
| Base Offset Type | odbus (Base | 0) ~ | | | |
| REAL / DINT Format | A BB CC DD | ~ | Master | Control | |
| Master Control Register | HR | 0 | Slave I | Device Enables | |
| Status Register C | s v | 0 | Slave | Device Control | |
| Device Control Register C | s ~ | 4096 | | | |
| DPV0 Diagnostic Register | HR | 0 | DPV0 | Diagnostic Enable | |
| DPV1 Message Register | HR | 0 | DPV1 | Message Enable | |
| DPV1 Alarm Register | HR | 0 | DPV1 | Alarm Enable | |
| Modbus Communication Status | HR | 0 | | | |

Figure 5.13 – DPV0 Diagnostic Holding Register parameters

The user will need to setup the required messaging parameters in the Holding Register fields and then set the trigger bit to extract the PROFIBUS Diagnostics from a field device. Once the transaction is complete the response part of the Holding Registers will be updated.

NOTE: The user will need to toggle the trigger Holding Register from 0 to 1 before the transaction will begin.

Below is the format of the Holding Registers used for retrieving DPV0 Diagnostics.

| Diagnostic Request | Holding Registe | | Description | | | | |
|-----------------------|--------------------|-----------|--|--|--|--|--|
| Trigger | 0 | | Bit 0 – Trigger Message Send | | | | |
| Timeout 1 | | | The time in Milliseconds if no response has been received before the transaction times out | | | | |
| Slave Address | 2 | | Target PROFIBUS Slave node address | | | | |
| Mode | 3 | | 0 – Read Diagnostic Buffer stored in the PLX51-PBM 1 – Read Diagnostic Buffer stored in the PLX51-PBM and Clear the Diagnostics Pending bit | | | | |
| Table 5.49 | 9 – Modbus D | PV0 Diagn | ostic Response Message Holding Register Format | | | | |
| Diagnostic | Holding | Descripti | ion | | | | |

| Table 5.48 – Modbus DPV0 | Diagnostic Re | anceseM teauna | Holding | Register Format |
|--------------------------|---------------|----------------|-----------|------------------|
| | Diagnostic Re | squest message | riolulity | Negister i Unnat |

| Diagnostic Response | Holding Register Offset | Description |
|------------------------|-------------------------------|---|
| Status | 4 | This is the status of the request. See appendix for the definitions of the returned status. |
| Data Size | 5 | The size of the diagnostics data to follow. |
| Data | 6 | The diagnostics data |

<u>Alarming</u>

The user can extract DPV1 Alarm data from a field device using the configured Modbus Registers. The user will need to enable DPV1 Alarm and set the required DPV1 Alarm HR Offset in the Modbus addressing tab of the Configuration window (see below).

| neral | Modbus | Modbus Addressing | Profibus | Logix | Advanced | Modbus Auxiliary Map | EtherNet/IP Devices | EtherNet/IP Map |
|-------|-------------|--------------------|-------------|-------|----------|----------------------|---------------------|-----------------|
| Mod | bus Addres | sing | | | | | | |
| I | Base Offset | t Type | Modbus (Bas | e 0) | \sim | | | |
| 1 | REAL / DI | NT Format | AA BB CC DI | D | \sim | Master | Control | |
| | Master Con | itrol Register | HR | (| D | Slave I | Device Enables | |
| : | Status Regi | ister (| cs ~ | (| D | Slave | Device Control | |
| | Device Cor | ntrol Register | cs v | 40 | 96 | | | |
| I | DPV0 Diag | nostic Register | HR | (| D | DPV0 | Diagnostic Enable | |
| I | DPV1 Mess | sage Register | HR | (| D | DPV1 | Message Enable | |
| 1 | DPV1 Alam | n Register | HR | (| D | DPV1 | Alarm Enable | |
| | Modbus Co | mmunication Status | HR | | 0 | | | |

Figure 5.14 – DPV1 Alarm Holding Register parameters

The user will need to setup the required messaging parameters in the Holding Register fields and then set the trigger bit to enable the DPV1 Alarm retrieving to begin. Once the transaction is complete the response part of the Holding Registers will be updated.

NOTE: The user will need to toggle the trigger Holding Register from 0 to 1 before the transaction will begin.

| Table 5.50 – Modbus DFVT Alami Request Message Holding Register Format | | | | | | |
|--|----------------------------|--|--|--|--|--|
| Alarm Request | Holding Register Offset | Description | | | | |
| Trigger | 0 | Bit 0 – Trigger Message Send | | | | |
| Timeout | 1 | The time in Milliseconds if no response has been received before the transaction times out | | | | |
| Slave Address | 2 | Target PROFIBUS Slave node address | | | | |

Below is the format of the Holding Registers used for DPV1 Alarming.

| Alarm Response | Holding Register Offset | Description |
|------------------|----------------------------|--|
| Status | 3 | This is the status of the DPV1 data exchange. See appendix for the definitions of the returned status. |
| Alarm Block Size | 4 | The size of the alarm data to follow. |
| | | The retrieved alarm data. |
| | | Below is the basic structure of the alarm data: |
| | | Byte 0 – Alarm Type 1 – Diagnosis Alarm |
| | 5 | 2 – Process Alarm |
| | | 3 – Pull Alarm |
| | | 4 – Plug Alarm |
| | | 5 – Status Alarm |
| | | 6 – Update Alarm |
| Alarm Data | | Byte 1 – Slot Number |
| | | Range 0 - 254 |
| | | Byte 2 - Bit 0 to 1 – Alarm Specifier |
| | | 0 – No further differentiation |
| | | 1 – Fault occurred and slot it not ok |
| | | 2 – Fault disappeared, and slot is ok |
| | | 3 – One fault disappeared, and slot is not ok |
| | | Byte 2 - Bit 3 to 7 – Sequence Number |
| | | Range 1 - 32 |
| | | Byte 3 to 59 – Alarm Data Description |

Table 5.51 – Modbus DPV1 Alarm Response Message Holding Register Format

Modbus Auxiliary Map

The Modbus Auxiliary Map can be used to read or write Modbus data from the local PLX51-PBM to a remote Modbus Slave. This will be enabled when *Enable Modbus Auxiliary Mapping* has been enabled in the Modbus tab and configured for Modbus Master. Up to 20 Modbus Slaves can be connected and up to 200 mapped items can be configured.

IMPORTANT: When Modbus Auxiliary Mapping is enabled, the automatic polling of referenced Modbus registers is disabled. It is the user's responsibility to ensure that all the required PROFIBUS control and data registers are collected from the appropriate remote Modbus slave devices.

5.2.2 PROFIBUS DP - Slave

The PLX51-PBM in Slave mode will operate similar to when in Master mode, but each configured Slave will be enabled by setting the correct enable bit in the Device Control Register. Once the respective bit has been set in the Device Control Register the PLX51-PBM Slave will become "alive" on the PROFIBUS network and will start responding to a PROFIBUS DP Master.

Slave Device Status

The Slave Status is populated in Coil (CS) or Holding (HR) registers starting at the **Status Register** offset.

| CS Offset | Description |
|--------------------------------|--|
| Master Status | |
| 0 | Configuration Valid |
| 1 | Owned |
| 2 | Duplicate DP Station |
| 3 | PROFIBUS Fieldbus Error |
| 4 | PROFIBUS Device Error |
| 5 | PROFIBUS OFFLINE |
| 6 | PROFIBUS STOPPED |
| 7 | PROFIBUS CLEAR |
| 8 | PROFIBUS OPERATIONAL |
| 9 | Master/Slave Mode (1 = Slave Mode) |
| 32 - 158 | Live List Flags (Station Address 0 - 126) |
| 160 - 286 | Data Exchange Flags (Station Address 0 - 126) |
| 288 - 414 | Alarm Pending Flags (Station Address 0 - 126) |
| 416 - 542 | Diagnostic Pending Flags (Station Address 0 - 126) |
| Slave Device Status | |
| 544 + (16 x [Station Address]) | Online |
| 545 + (16 x [Station Address]) | Data Exchange Active |
| 546 + (16 x [Station Address]) | Ident Mismatch |
| 547 + (16 x [Station Address]) | Disabled by Output Assembly |
| 548 + (16 x [Station Address]) | Device Error |
| 549 + (16 x [Station Address]) | Alarm Pending |
| 550 + (16 x [Station Address]) | Diagnostics Pending |
| 551 + (16 x [Station Address]) | Output Assembly Station Address Mismatch |
| 552 + (16 x [Station Address]) | Mapping CRC Mismatch |
| 553 + (16 x [Station Address]) | Slave Clear Op Mode |
| 554 + (16 x [Station Address]) | Slave Alarm Ack |

Table 5.52 – Modbus Master and Device Status

The Slave Device Enable and (Alarm) Control is located in Coil (CS) or Holding (HR) registers starting at the Device Control Register offset.

| CS Offset | Description | | |
|-------------------------------|---|--|--|
| Device Enable | | | |
| 0 + [Station Address] | Device Enable (Station Address 0 - 126) | | |
| Device Control | | | |
| 128 + (8 x [Station Address]) | DPV1 Alarm Trigger | | |

The Modbus Communication Status is located in Holding (HR) registers starting at the *Modbus Communication Status offset* configured in the *Modbus Addressing* tab.

| I able 5.54 – Modbus Communication Status | | | | | | |
|---|--|--|--|--|--|--|
| HR Offset | Description | | | | | |
| Modbus Communication Status when | Modbus Communication Status when operating as a Modbus Slave | | | | | |
| | Bit 0 – PLX51-PBM Modbus Slave Communication Status | | | | | |
| 0 | 1 – Modbus Communication Ok | | | | | |
| | 0 – Modbus Communication Failed | | | | | |
| Modbus Communication Status when | operating as a Modbus Master | | | | | |
| | Bit 0 – Modbus Node 0 Communication Status | | | | | |
| 0 | 1 – Modbus Communication Ok | | | | | |
| | 0 – Modbus Communication Failed | | | | | |
| | Bit 0 – Modbus Node 1 Communication Status | | | | | |
| 1 | 1 – Modbus Communication Ok | | | | | |
| | 0 – Modbus Communication Failed | | | | | |
| | | | | | | |
| | Bit 0 – Modbus Node 253 Communication Status | | | | | |
| 253 | 1 – Modbus Communication Ok | | | | | |
| | 0 – Modbus Communication Failed | | | | | |
| | Bit 0 – Modbus Node 254 Communication Status | | | | | |
| 254 | 1 – Modbus Communication Ok | | | | | |
| | 0 – Modbus Communication Failed | | | | | |

Table 5.54 – Modbus Communication Status

DPV0 Data Exchange

The DPV0 data exchange for each slave device is configured in the slot configuration.

Slot Configuration

| Slot | Description | Module | | | | Data Po | int | Data Type | • | Byte Length | Registe Type | | Modbus Offset | DP Offset | Ext User Prm |
|------|------------------|-------------------------|---------|---|---|---------|--------|-----------|---|----------------|-----------------|--------|------------------|--------------|-----------------|
| 1 | a6ES73271BH000AB | 138-6ES7 327-1BH00-0AB0 | 8DI/8DX | + | | Input | \sim | INT | ~ | 2 | HR | \sim | 2000 | 0 | 155F01001 |
| | a6ES73271BH000A1 | | | + | X | Output | \sim | INT | ~ | 2 | HR | \sim | 2001 | 0 | |

Figure 5.15 – Slave Device Slot configuration – Modbus

DPV1 Class 1 Messaging (MS1)

The user can exchange DPV1 Class 1 data with a configured field device using the configured Modbus Registers. The user will need to assign Slot and Index combinations to Modbus Holding Register Addresses (see below).

| General | Profibus Configuration | DPV1 User Param | neters Slot Configur | ation Start-up Parameters | DPV | 1 Objects DPV1 Alarms |
|---------|------------------------|-----------------|----------------------|---------------------------|-----|-----------------------|
| - DPV | 1 Objects | | | | | |
| | Slot | Index | Size | Functions | | Modbus Address |
| • | 1 | 0 | 1 | Read/Write | - | 3524 |
| | 1 | 32 | 4 | Read/Write | - | 3525 |
| | 2 | 5 | 8 | Read/Write | - | 3527 |
| | 3 | 0 | 16 | Read/Write | - | 3531 |
| | 4 | 8 | 32 | Read/Write | - | 3539 |
| | 9 | 10 | 64 | Read/Write | - | 3556 |
| | 254 | 254 | 100 | Read/Write | - | 3588 |
| | 254 | 253 | 240 | Read/Write | - | 3638 |
| | 10 | 0 | 1 | Read | - | 3758 |
| | 10 | 1 | 1 | Write | - | 3759 |
| | 11 | 1 | 1 | Read | - | 3760 |
| | 12 | 0 | 4 | Write | - | 3761 |
| | 13 | 13 | 1 | Read/Write | - | 3762 |

Figure 5.16 – DPV1 Objects Holding Register address

Once the PROFIBUS Master reads or writes to a DPV1 Class 1 Slot/Index, the PLX51-PBM will use the data located at the configured Modbus Address.

NOTE: If the PLX51-PBM has been setup as a Modbus Master then the data will be read or written to the specific Modbus HR address in the target device when the DPV1 Message request is received on the PROFIBUS network.

<u>Alarming</u>

The PLX51-PBM supports DPV1 Alarming when operating as a PROFIBUS Slave. The user can trigger an alarm from the Modbus Device Control Register offset which will notify the PROFIBUS Master that a new alarm has been generated. When the PROFIBUS Master sends a DPV1 alarm read command, the PLX51-PBM will access the configured Modbus Holding address to provide the required data for the specific alarm.

NOTE: The PLX51-PBM can only allow one alarm to be triggered at a time.

To trigger an alarm notification for the PROFIBUS Master the user will need to toggle (from 0 to 1) the Alarm Trigger bit in the Device Control Register Offset as shown below:

| Table 5.55 - | Modbus | Slave | Device | Control |
|--|--------|-------|--------|---------|
| 1000 - 300 | Moubus | Olave | Device | Control |

| CS Offset | Description |
|-------------------------------|--------------------|
| Device Control | |
| 128 + (8 x [Station Address]) | DPV1 Alarm Trigger |

Once the alarm has been triggered the PLX51-PBM will read/write the alarm data from the configured Modbus Holding Register address range and add it to the PROFIBUS diagnostics (which will then be read by the PROFIBUS Master) as shown below.

| ¢ | PLX51 | L-PBM Slave - 2 - Devid | e Configuration | | | | E |
|---|---------|--------------------------|----------------------|--------------------|---------------------|--------------|-------------|
| | General | I Profibus Configuration | DPV1 User Parameters | Slot Configuration | Start-up Parameters | DPV1 Objects | DPV1 Alarms |
| | - DPA | √1 Alarms | | | | | |
| | | Size | Modbus Address | | | | |
| | • | 63 | 3763 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Figure 5.17 – DPV1 Alarm Holding Register address

When the PROFIBUS Master acknowledges the alarm, the SlaveAlarmAck bit will be set, indicating that the next alarm can be triggered.

| CS Offset | Description |
|--------------------------------|--|
| Slave Device Status | |
| 544 + (16 x [Station Address]) | Online |
| 545 + (16 x [Station Address]) | Data Exchange Active |
| 546 + (16 x [Station Address]) | Ident Mismatch |
| 547 + (16 x [Station Address]) | Disabled by Output Assembly |
| 548 + (16 x [Station Address]) | Device Error |
| 549 + (16 x [Station Address]) | Alarm Pending |
| 550 + (16 x [Station Address]) | Diagnostics Pending |
| 551 + (16 x [Station Address]) | Output Assembly Station Address Mismatch |
| 552 + (16 x [Station Address]) | Mapping CRC Mismatch |
| 553 + (16 x [Station Address]) | Slave Clear Op Mode |
| 554 + (16 x [Station Address]) | Slave Alarm Ack |

NOTE: An alarm is triggered when the Alarm Trigger bit toggles from 0 to 1.

The format of the DPV1 Alarm data in the Modbus Holding Register array is shown below:

| Alarm Parameter | Holding Register Offset | Byte Size | Description |
|-----------------|----------------------------|--------------|---|
| Alarm Length | 0 – low byte | 1 | Length of the Alarm Data in bytes. See appendix for the definitions of the returned status. |
| | | | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |
| Alarm Type | 0 – hi byte | 1 | Below are some examples: 1 - Diagnosis_Alarm 3 - Pull_Alarm 4 - Plug_Alarm |
| Alarm Slot | 1 – low byte | 1 | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |
| | | | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |
| Alarm Specifier | 1 – high byte | 1 | Below are some examples: 0 - no further differentiation 1 - Incident appeared 2 - Incident disappeared and slot is ok 3 - One incident disappeared, others remain |
| Alarm data | 2 | Alarm Length | Refer to the PROFIBUS Specification EN 50170 for information regarding the diagnostics. |

Table 5.57 – Slave Alarm Data Format

Modbus Auxiliary Map

The Modbus Auxiliary Map can be used to read or write Modbus data from the local PLX51-PBM to a remote Modbus Slave. This will be enabled when *Enable Modbus Auxiliary Mapping* has been enabled in the Modbus tab and configured for Modbus Master. Up to 20 Modbus Slaves can be connected and up to 200 mapped items can be configured.

IMPORTANT: When Modbus Auxiliary Mapping is enabled, the automatic polling of referenced Modbus registers is disabled. It is the user's responsibility to ensure that all the required PROFIBUS control and data registers are collected from the appropriate remote Modbus slave devices.

5.3 EtherNet/IP Explicit Messaging Operation

When the PLX51-PBM has been setup for EtherNet/IP Explicit Messaging communication it will exchange data with remote EtherNet/IP devices using either connected Class 3 messaging or Unconnected Messaging (UCMM). This will allow the user to exchange data between a EtherNet/IP device and a Profibus DP Master.

IMPORTANT: EtherNet/IP Explicit Messaging is only allowed when the PLX51-PBM is operating as a Profibus Slave.

The user can map up to 10Kbytes of EtherNet/IP data to the PLX51-PBM module which can then be mapped to DPV0 communication data for any of the configured DP Slaves.

Each EtherNet/IP device configured can also provide communication status which can be mapped to DPV0 data to inform the DP Master that the PLX51-PBM (in slave mode) has lost communication with a specific EtherNet/IP device. The user will need to enter the location in the Data Table where the communication status for the device can be found (as shown below).

| ieneral N | Modbus Modbus Addr | essing Profibus | Logix Advanced | Modbus Auxiliary Map | EtherNet/IP Device | therNet/IP | Мар | |
|-----------|----------------------------------|-----------------|----------------|----------------------|--------------------|------------|--------------|--------------------|
| Schedu | Iled Device Settings | | | | | | | |
| Eth | erNet/IP Communication | UCCM | \sim | Scan C | lass A 5 | 00 ms | Scan Class | C 2000 r |
| Eth | erNet/IP Explicit Timec | out 2000 | ms | Scan C | lass B 10 | 00 ms | Scan Class I | D 5000 r |
| | | | | | | | | |
| Det | rice List (may 5) | | | | | | | |
| Dev | vice List (max 5) Device Name | | CIP Path | | Browse Tin | neout Ret | try Count | Comm Status Offset |
| Dev | | 192.168.1.100 | | | | neout Ret | try Count | Comm Status 0 |

Figure 5.18 – EtherNet/IP Explicit Messaging Communication Status

Communication Status per EtherNet/IP device

Bit 0 - (1) Device online / (0) Device offline.

Bit 1 to 7 – Reserved.

5.4 Explicit Messaging Utility

For PLX51-PBM Master mode only, the PLX50 Configuration Utility provides a utility to initiate explicit messages to the PROFIBUS devices. The messaging options include the following:

- DPV1 Class 1 Read
- DPV1 Class 1 Write
- DPV1 Class 2 Read
- DPV1 Class 2 Write
- Read Diagnostics
- Read Alarms

To open this utility, right-click on a PROFIBUS device and select the *Explicit Messaging* option.

| 🚸 ProSoft PLX50 Configurat | ion U | tility - PBM* | | | |
|--|-------|-------------------------|--|--|--|
| File Device Tools W | /indo | w Help | | | |
| ። 🔁 🛋 🖿 🗶 🗗 🗇 | + | 🖉 🗹 🛠 🍫 | | | |
| Project Explorer | | → ₽ X | | | |
| MyPLX51-PBM (PLX51-PBM) Configuration Status Event Viewer Profibus Devices [002] Slave | | | | | |
| 🗄 🌗 PLX51-PBM Slav | 2 | Configuration Status | | | |
| | П | Сору | | | |
| | X | Delete | | | |
| | 5 | View GSD File | | | |
| | 5 | Device Config Report | | | |
| | 4 | Explicit Messaging | | | |

Figure 5.19 – Explicit Messaging Option

Use the *Action* combo-box to select the type of explicit message. Depending on the type selected, various other parameter controls will become available. Once the correct parameters have been entered select the *Execute* button to initiate the explicit exchange.

NOTE: For Class 2 messages, if a class 2 connection has not already been established, then a Class 2 Initialization message will first be sent. The class 2 connection will then remain open until either the station address is changed, the manual *Abort* button is selected, or the utility is closed.

| PV1 Action | Read Diagnostics | ~ | Execute | |
|----------------------|------------------|--------------|-------------------|--------|
| Station Address | 2 ~ | | Timeout 2000 (ms) | |
| Details | | Class 2 | | |
| Slot Number | 0 | State | - | |
| Index Data Length | 240 | | Initialize Abort | |
| Request Data | | Clear Diagno | stic Latch | |
| | | | | ~ |
| Status | | | Ok | |
| Response Date | 3 | | | |
| 24 00 0C 00 01 | 15 | | | ^ ~ |

Figure 5.20 – Explicit Messaging Utility

5.5 Firmware Upgrade

The PLX51-PBM allows the user to upgrade the module firmware in the field. If the firmware needs to be updated the user will need to use the PLX50 Configuration Utility to update it.

In the PLX50 Configuration Utility go to the Tool menu and select the *DeviceFlash* option.

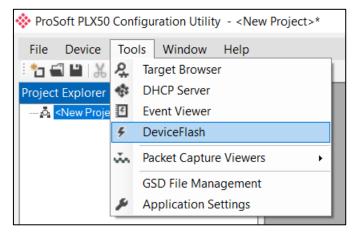


Figure 5.21 - DeviceFlash Tool

The user will need to select the appropriate AFB binary file which will be used to upgrade the PLX51-PBM firmware.

| 🔆 Select a Device Flash File | | | | × |
|--|-------------------------------------|-------------------|------------------------|--------|
| \leftarrow \rightarrow \checkmark \uparrow \blacksquare \rightarrow This | PC > Documents > ProSoft Technology | ~ Ū | Search ProSoft Technol | ogy 🔎 |
| Organize ▼ New folder | | | u=== u=== u=== ▼ | |
| 🛆 OneDrive - Person | Name | Date modified | Туре | Size |
| 🧢 This PC | 😂 PLX51_PBM_1001.afb | 9/6/2018 10:07 AM | AFB File | 532 KB |
| 🔓 3D Objects | | | | |
| 늘 Desktop | | | | |
| Documents | | | | |
| 🔈 Downloads | | | | |
| 🐌 Music | | | | |
| E Pictures | | | | |
| 📳 Videos | | | | |
| 👟 OS (C:) | | | | |
| 🥌 Local Disk (D:) | | | | |
| ~ < | | | | > |
| File name | :: PLX51_PBM_1001.afb | ~ | Device Flash (*.afb) | \sim |
| | | | Open | Cancel |

Figure 5.22 - Select the AFB binary

| 🔅 Target | Browser | _ | × |
|----------|--|---|------|
| *₩⊘ | | | Done |
| | 192.168.1.211 : DNP3 Router | | ^ |
| 1 | 192.168.1.202 : HDLC Router | | |
| | 192.168.1.172 : PLX51-PBM | | |
| | 192.168.1.210 : DNP3 Router | | |
| I | 192.168.1.188 : ControlNet Router | | |
| . | 192.168.1.102 : 1756-EN2TR/C 217021900 | | |
| 1 | 192.168.1.203 : HDLC Router | | |
| 1 | 192.168.1.155 : HART 4Out | | |
| 1 | 192.168.1.156 : HART 4In | | |
| 1 | 192.168.1.181 : Modbus Router 485 | | |
| 1 | 192.168.1.229 : DF1 Messenger | | |
| | | | ~ |
| | Ok Cancel | | |

Figure 5.23 - Select the correct PLX51-PBM module

Once the module is done upgrading the firmware the Device Flash tool will provide the user with the details of the updated module.

| 🔅 Device Flash | | | |
|----------------|----------------|---------------|---|
| File Tools | | | |
| 🖬 📼 🗲 | | | |
| Parameter | Source File | Target Device | ^ |
| Path | PLX51_PBM_1001 | 192.168.1.172 | |
| Product | PLX51-PBM | PLX51-PBM | |
| Vendor | 309 | 309 | |
| Device Type | 12 | 12 | |
| Product Code | 5228 | 5228 | |
| Revision | 1.001 | 1.001 | ~ |
| | Flash | Cancel | |
| Complete | | | |

Figure 5.24 – PLX51-PBM successfully updated.

IMPORTANT: The PLX51-PBM firmware is digitally signed so the user will only be able to flash the PLX51-PBM with authorized firmware.

6 Migrating Legacy PCB Projects

The PLX50 Configuration Utility provides a method to simplify the migration from a ProSoft Configuration Builder (PCB) PROFIBUS application to a PLX51-PBM application. The process involves first exporting the configuration from the PCB software and then importing it into the PLX50 Configuration Utility.

Before importing a PCB application, ensure that all the necessary GSD files have first been registered in the PLX50 Configuration Utility's GSD Manager.

The PCB import requires a PLX51-PBM project with no existing slave devices configured.

Open the ProSoft Configuration Builder (PCB) software and open the existing PROFIBUS project.

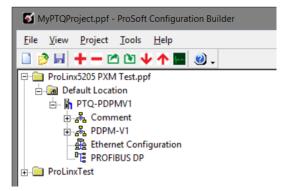


Figure 6.1 – PCB Project

Expand the PROFIBUS configuration and right-click on the **PROFIBUS DP** menu item and select the **Configure** option.

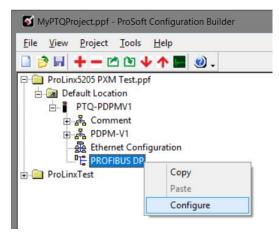


Figure 6.2 – PCB PROFIBUS DP Configuration

The PROFIBUS Master window will open. Select the *Export Master Config* button located at the bottom of the window.

If the *Export Master Config* button is disabled, then first select the *Configure PROFIBUS* button. This will open the PROFIBUS configuration tool, once this tool has been closed the *Export Master Config* button will then be enabled.

| PDPMV1 PROFIBUS Master Setup | | x | | | | | | |
|---|--|---|--|--|--|--|--|--|
| PROFIBUS Master - Module Communications Profibus Editor : Terminated : Project Changed : Project | | | | | | | | |
| Select Port: Com 3 | Firmware Update | | | | | | | |
| Test Connection CIP Path Edit | Cancel Update | | | | | | | |
| Carfering DBOTTBUC | Checksums FIBUS: DE560DC Iodule: 98B78A1F Calculate | | | | | | | |
| Processor Network Memory Map Show Concept Map | Show Unity Map | | | | | | | |
| Export Master Config | OK |] | | | | | | |

Figure 6.3 – PCB Export Master Configuration

The generated export (XML) file can then be saved.

| 🚺 Save As | | | | | | | x | |
|--|-------------------|-------|------|-------------|----------------|---------------|------|--|
| ← → ▼ ↑ 🔄 « Documents > ProSoft Technology > PTQ V Č) Search PTQ | | | | | | | | |
| Organize 🔻 New | w folder | | | | | | • | |
| 🗸 📌 Quick access | | ^ | Name | ^ | | Date modified | Туре | |
| 📃 Desktop | 1 | e = | | No items ma | tch your searc | h. | | |
| 👆 Downloads | 1 | e | | | | | | |
| 🔮 Documents | 1 | e | | | | | | |
| ProSoft Techn | ology | e | | | | | | |
| Pictures | 1 | e | | | | | | |
| 🙀 SharePoint | 1 | * ~ < | | Ш | | | > | |
| File name: | PTQ-PDPMV1.xml | | | | | | ~ | |
| Save as type: | Cfg Files (*.xml) | | | | | | ~ | |
| ∧ Hide Folders | | | | | Save | Cancel | | |

Figure 6.4 – PCB – Save Export XML File

In the PLX50 Configuration Utility, right-click on the *PLX51-PBM* module and select the *Import Legacy PCB Configuration* option.

| ProSoft PLX50 Configuration Utilit | y - | <new project="">*</new> |
|--|------------|---------------------------------|
| File Device Tools Window | Hel | p |
| 🗄 🖆 🔛 👗 🗗 🗂 🕂 🗐 🖸 . | ₽ 4 | \$* |
| Project Explorer | ÷ 9 | × |
| Image: Section of the section of | _ | |
| MyPLX51-PBM (PLX51-PBM Configuration | يو | Configuration |
| Profibus Devices | | Connection Path |
| | 1 | Verify Configuration |
| | +0 | Identity |
| | 5 | Status |
| | 4 | Go Offline |
| | 41- | Go Online |
| | ₽ | Download |
| | Ť | Upload |
| | 80 | Save Configuration to SD Card |
| | ň. | DP Packet Capture |
| | ø | Global Control |
| | ň. | Modbus Packet Capture |
| | 5 | Generate Status Report |
| | ŋ | Сору |
| | ¢ | Export |
| | x | Delete |
| | 8 | Import Legacy PCB Configuration |
| | 3 | Generate Logix L5X |

Figure 6.5 – Import Legacy PCB Configuration

After the import is complete, an *Import Report* summary will be shown, and may indicate any issues encountered during the import process.

If an exact GSD filename is not found, a suitable (matching) alternative will be sought.

The master and slave device configurations can then be modified if required.

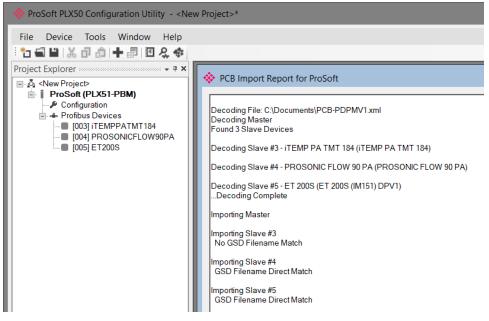


Figure 6.6 – Legacy PCB Import Report

7 Device Type Manager (DTM)

The PLX51-PBM supports FDT / DTM technology, allowing the user to configure any slave device using its DTM (Device Type Manager) in any standard FDT Frame (Field Device Tool). To use a device DTM with the PLX51-PBM, the ProSoft PLX51 DTM pack will first need to be installed.

7.1 Installation

Installation of the PLX51 DTM pack is achieved by executing the following installer from <u>www.prosoft-technology.com</u>:

ProSoft Technology - ILX51 HART and PROFIBUS DTM Pack 1.xxx Setup.msi

The installation wizard will guide the user through the installation process.



Figure 7.1 – PLX51 DTM Pack Installation

7.2 Configuration

Once the DTM pack is installed, the selected FDT Frame would need to have its DTM Catalogue updated. The steps required for this action are slightly different for each FDT frame. Typically, one selects the DTM Catalogue or Device Catalogue and select Refresh or rebuild.

After the catalogue has been updated, the PLX51-PBM device can then be added to a new project. This involves selecting the Add Device function and then selecting the PLX51-PBM DTM. The example below makes use of PACTware FDT frame.

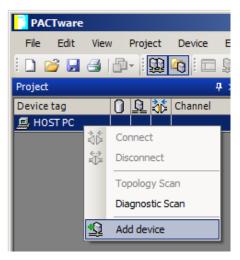


Figure 7.2 – Adding new device

| Device 🔺 | Protocol | Vendor | Group | Device Version | FDT version | DTM version | 4 |
|--------------------------------|----------------|--------------------------------|---------------|-----------------|-------------|----------------------|---|
| CDI Communication FXA291 | CDI | Endress+Hauser | not specified | 1.08.00 / 2012 | 1.2.0.0 | 5.06.0400 / 2012-06- | |
| CDI Communication TCP/IP | CDI TCP/IP | Endress+Hauser | not specified | 1.08.00 / 2012 | 1.2.0.0 | 5.06.0400 / 2012-06- | |
| CDI Communication USB | CDI USB | Endress+Hauser | not specified | 1.08.00 / 2012 | 1.2.0.0 | 5.06.0400 / 2012-06- | |
| CommDTM PROFIBUS DP-V1 | Profibus DP/V1 | Trebing & Himstedt Prozeßautor | not specified | 4.0.0.9 / 2011- | 1.2.0.0 | 4.0.0.9 / 2011-01-17 | |
| 🖗 FF H1 CommDTM | Fieldbus FF H1 | Endress+Hauser, Metso Automa | not specified | 1.5 / 2009-08-1 | 1.2.0.0 | 1.5 / 2009-08-17 | |
| Flow Communication FXA193 | ISS | Endress+Hauser | not specified | 3.18.00 / 2012 | 1.2.0.0 | 6.06.1900 / 2012-06- | |
| E FXA520 | HART | Endress+Hauser | not specified | 1.05.09 / 2011 | 1.2.0.0 | 1.05.09 / 2011-07-15 | |
| 🚭 HART Communication | HART | CodeWrights GmbH | not specified | 1.0.52 / 2015-0 | 1.2.0.0 | 1.0.52 / 2015-03-17 | |
| 🖗 HART OPC Client | HART | Endress+Hauser, Metso Automa | not specified | 2.0 / 2009-05-2 | 1.2.0.0 | 2.0 / 2009-05-28 | |
| 🖽 IPC (Level, Pressure) FXA193 | IPC | Endress+Hauser | not specified | 1.02.12 / 2008 | 1.2.0.0 | 1.02.12 / 2008-10-21 | |
| 🖽 PCP (Readwin) TXU10/FXA29 | PCP | Endress+Hauser | not specified | 1.01.14 / 2009 | 1.2.0.0 | 1.01.14 / 2009-12-16 | |
| 🛊 PLX51 PBM | Profibus DP/V1 | ProSoft Technology Inc | not specified | 1.001 / 2018-1 | 1.2.0.0 | 1.001 / 2018-11-27 | |
| PLX51-Hart-4I | HART | ProSoft Technology Inc | not specified | 1.001 / 2018-0 | 1.2.0.0 | 1.001 / 2018-06-25 | |
| PLX51 PBM | | | | | | | |

Figure 7.3 – Selecting PLX51-PBM DTM

After instantiating the PLX51-PBM DTM, select the Parameter option.

| PACTware | | | | | | | | | |
|------------------------|----------|-----|------------|---|-----------------|--------|-----------|------|------|
| File Edit View | Proj | ect | | Device | Ex | tras | Window | Help | |
| 🗄 🗋 🚰 🛃 🎒 🎰 | <u>0</u> | 0 | Ē |] 💵 1 | 0 1 | 2 🧕 | 🐝 🐳 🔳 | | |
| Project | | | | | | | | | |
| Device tag 🛛 🚺 👥 👌 Cha | | | Chann | el | Addr | ess | Status | Tin | |
| B HOST PC | | | | | | | | | |
| FLX51 PBM | | + | 1 0 | | C C | nned | | | |
| | | | | , international | | sconn | | | |
| | | | | | | | | | -88 |
| | | | | <u> </u> | | ad fro | om device | | - 84 |
| | | | | <u>N</u> | Store to device | | | | - 84 |
| | | | | =: | | | ac vice | | - 64 |
| | | | | | | irame | | | |

Figure 7.4 – Select Parameter option

The PLX51-PBM DTM's configuration allows the CIP Path to the PLX51-PBM to be configured. This is typically just the IP address of the PLX51-PBM.

| PLX51 PBI | 1 Configuration | |
|---------------|-----------------|--|
| EtherNet/IP 0 | onfiguration | |
| CIP Path | 192.168.1.176 | |
| | | |
| | Ok Cancel | |

Figure 7.5 – PLX51-PBM CIP Path

The path can either be entered manually or the Browse button can be used to open the Target Browser, and then the PLX51-PBM can be selected.

| å | a Target I | Browser | × |
|---|------------|---|------|
| P | ΨØ | | Done |
| | • | 192.168.1.176 : PLX51-PBM 192.168.1.202 : HDLC Router 192.168.1.179 : DNP3 Router/B 192.168.1.203 : HDLC Router 192.168.1.203 : HDLC Router 192.168.1.102 : 1756-EN2TR/C 217021900 192.168.1.175 : PLX51-PBS 192.168.1.156 : PLX51-HART-4I 192.168.1.154 : IP Point HART In | |
| | | Ok Cancel | // |

Figure 7.6 - Target Browser

Once the PLX51-PBM DTM has been configured, the child Device DTMs can be added by right-clicking on the PLX51-PBM DTM and selecting Add Device.

| Device | Protocol | Vendor | Group | Device Version | FDT version | D1_ |
|---|------------------------------|---|------------------------------|------------------|---------------|-----|
| 🔈 kajaaniMCA PA | Profibus DP/V1 | Metso Automation | not specified | 0 / 2004-03-21 | 1.2.0.0 | 1.2 |
| 🗅 kajaaniROTARY PA | Profibus DP/V1 | Metso Automation | not specified | A/2007-03-30 | 1.2.0.0 | 1.2 |
| 👦 Level Profile DTM | Profibus DP/V1 | Endress+Hauser | Level | 1.5.67.11 / 200 | 1.2.0.0 | 1.5 |
| D ND800PA | Profibus DP/V1 | Metso Automation | Positioner | 1.0 / 2003-01-1 | 1.2.0.0 | 1.2 |
| D ND9000PA | Profibus DP/V1 | Metso Automation | Positioner | SW 1.00-1.29 / | 1.2.0.0 | 1.2 |
| D ND9000PA | Profibus DP/V1 | Metso Automation | Positioner | SW 1.30-1.50 / | 1.2.0.0 | 1.2 |
| D ND9000PA | Profibus DP/V1 | Metso Automation | Positioner | SW 1.51-1.80 / | 1.2.0.0 | 1.2 |
| D ND9000PA | Profibus DP/V1 | Metso Automation | Positioner | SW 4.00-4.99 / | 1.2.0.0 | 1.2 |
| Pressure Profile DTM | Profibus DP/V1 | Endress+Hauser | Pressure | 1.5.67.11 / 200 | 1.2.0.0 | 1.5 |
| 📲 Promass 200 / 8x2Bxx / PA / FW 1 | 1.00.zz CDI; Profibus DP/V1 | Endress+Hauser | Flow | 1.0.0.0 / 2012- | 1.2.0.0 | 1.3 |
| Smart Pulp-PA | Profibus DP/V1 | Metso Automation | not specified | M3 / 2004-02-0 | 1.2.0.0 | 1.2 |
| Temperature Profile DTM | Profibus DP/V1 | Endress+Hauser | Temperature | 1.5.67.11 / 200 | 1.2.0.0 | 1.5 |
| • | | | | | | ► |
| ;**Device.PA_11_155F_0101_{ 200;**;**SOFTWARE_REVISIO BER::0x155F::0x9742;**;**IS | | :17;**;**DEVICE_ID::Pron WARE_REVISION_MAX::01 | nass 1.00.99;**;**PROFILE | E_REVISION::3.2; | ;**;**IDENT_I | NUM |

Figure 7.7 – Device DTM Selection

Once the child Device DTM has been added, a configuration window opens to set the Station Node address.

| ü | PLX51 PBM | | | | |
|---|---------------|-----------|---|--------|--|
| | Device Config | uration — | | | |
| | Node / | Address | 3 | | |
| | | Ok | | Cancel | |

Figure 7.8 – Device DTM Node Address

7.3 Operation

After the FDT project has been configured, the DTMs can be place online by selecting the Online or Connect option.

| PACTware | | | | | | | | | |
|--------------------------|----------|----------|----------|-------|------|-------|------|-----|----------|
| File Edit View Project D | evi | ce | Extra | s ۱ | Wind | ow | Help | | |
| i 🗋 🎽 🚽 🕘 🔂 - 🛄 🍋 i 🗖 | Q | | <u>s</u> | 🗕 🖏 | | | | | |
| Project | | | | | | | | | ₽ |
| Device tag | 0 | <u> </u> |) 🏂 Ch | anne | și 👘 | Addre | ess | | Status |
| B HOST PC | | | | | | | | | |
| 🖬 🐺 PLX51 PBM | | Con | | | | 102.1 | CO 1 | 176 | 0 |
| |)¢ → | | | - | | | | | 0 |
| - | Ŭ= | DISC | onne | CL | | | | | |
| | | Load | l fron | n dev | vice | | | | |
| <u>∎</u> | <u>0</u> | Stor | e to o | devic | e | | | | |
| | | Para | mete | er | | | | | |

Figure 7.9 – DTM Connect

Once the PLX51-PBM DTM is online (connected) a number of diagnostic pages can be opened by selecting the Measure Value.

| PACTware | | | | | | | | |
|-------------------------------|----------|----------|--------------|-----------|-------|---------------|--------|----------|
| File Edit View Project D | evio | e | Ex | tras | Wind | ow Help | | |
| i 🗋 💕 🛃 🎒 🗗 - İ 🔛 🍋 İ 🗖 | <u>)</u> | Ŋ | 11 | 1 🧕 | di 👬 | | | |
| Project | | | | | | | ą | \times |
| Device tag | 0 | <u>Q</u> | 36 | Chan | nel | Address | Status | Т |
| B HOST PC | | | | | | | | |
| 🛯 🐺 PLX51 PBM | / | 1- | - D - | | | 192.168.1.176 | | |
| 🖾 Promass 200 / 8x2Bxx / PA / | 1 | -†- | ⊲⊳ | | Conn | ect | - 1 | |
| | | | | ₩ | Disco | nnect | | |
| | | | | <u>QÞ</u> | Load | from device | | |
| | | | | <u>N</u> | Store | to device | | |
| Parameter | | | | | | | | |
| | | | | | Meas | sured value | | |
| | | | | | Simul | ation | | |

Figure 7.10 – Measured Value

The General page provides basic status information for the PLX51-PBM module, including LED status and CPU status etc.

| PLX51 PBM # | Measured value | | | 4 ▷ 🗙 |
|----------------------|------------------|-----------------------------|-------------------------------------|-----------------------------|
| | Device Name: | PLX51 PBM | | * |
| | Description: | Ethernet Profibus DP Master | | ProSoft [®] |
| | Status: | Online | | T E C H N O L O G Y |
| General Live List | <u>General</u> | | | |
| | Config Valid | Valid | Sys MAC Address 👔 00:60:35:2D:BB:36 | |
| | Owned | Owned | Firmware Revision | |
| | Mode | StandaloneMaster | Temperature 🔇 33.4 °C | |
| | Profibus State | Operational | Processor Scan 🔇 15 us | |
| | Master Node | 0 | Up Time 🔇 0d - 00:05:53 | |
| | BAUD Rate | 93.75 | Ethernet Port 1 🔇 Up | |
| | Acyclic Requests | s 🔇 0 | Ethernet Port 2 🔇 Down | |
| | | | DIP Switches SW1 - Safe Mode 🔇 Off | |
| | | | SW2 - Force DHCP 🔇 Off | |
| | | | | |
| J | | | | |

Figure 7.11 – PLX51-PBM DTM - General Status Page

The Live List page shows the state of the devices on the PROFIBUS network.

| | t Measured value | | | | | | | | | | | 4 ⊳ |
|----------------------|------------------|---------------|------------|---------|---------|---------|-----|---------|----------|-----|------------------------|---------|
| | Device Name: | PLX51 | PBM | | | | | | | | | |
| | Description: | Etherne | t Profibus | s DP Ma | ster | | | | | | | ProSoft |
| | Status: | 🛃 On | line | | | | | | | | | |
| General Live List | Live List | | | | | | | | | | | |
| | ⊂Profibus DP | 1.5 | | | | | | | | | | |
| | | | | | | | 1 | | | | | |
| | | M 2 | 3 | 4 | 5 15 | 6 16 | 7 | 8 18 | 9 | Key | | |
| | | 1 12 21 22 | 13 23 | 24 | 25 | 26 | 27 | 28 | 19 29 | | Not Available | |
| | | 31 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | × | Live + Data Exchange | |
| | | 1 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | | Erre · Data Excitatige | |
| | | 51 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | × | Live + Not Exchanging | |
| | | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | | Configured - Net Live | |
| | 70 7 | 71 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | X | Configured + Not Live | |
| | 80 8 | 31 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | XM | DP Master | |
| | 90 9 | 91 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | | | |
| | 100 1 | 01 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | × | Unconfigured | |
| | 110 1 | 11 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | | | |
| | 120 1 | 21 122 | 123 | 124 | 125 | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Figure 7.12 – PLX51-PBM DTM - Live List Page

Slave Device DTM under the PLX51-PBM DTM can also be brought online by selecting the Online or Connect option.

| PACTware | | | |
|------------------------------|-------------------|---------------|--|
| File Edit View Project [| Device Extras Win | ndow Help | |
| i 🗅 🧉 🚽 🎒 👘 i 🛄 🙀 i 🗖 |] 静雨 福 🍵 🌾 🕴 | | |
| Project | | 4 × | |
| Device tag | 🕕 👲 😻 Channel | Address S | |
| B HOST PC | | | |
| 🖻 🗑 PLX51 PBM | / + 🕩 | 192.168.1.176 | |
| 📖 🛲 Promass 200 / 8x2Bxx / 🎴 | J Z -⊁ ∰ Ch00 | 3 | |
| 3 | ⊱ Connect | | |
| | j≩ Disconnect | | |

Figure 7.13 – Slave Device DTM Connect

Depending on the device DTM, a number of online parameters, diagnostics and measure variables can be displayed.

| 🖽 Promass 200 / 8x2Bxx / PA / FW 1.00.zz / Dev. | Rev. 1 # Online parameteriz | ation 4 b × |
|---|-----------------------------|------------------------------|
| Promass 200 | | 0.0055 kg/s |
| Device tag: Promass 200PA | | 0.0027 l/s Endress+Hauser |
| Status signal: 💋 🗹 OK | Corrected volume flow: 🖉 · | -0.0001 NI/s |
| 🖬 🖬 🔲 All parameters 🛛 🛛 🚀 😂 🛸 | | |
| Menu / Variable Value 🔿 | Mass flow: | 0.0055 kg/s |
| Promass 200 | Volume flow: | 0.0027 l/s |
| PC Access status tooling: Mainten Display/operation | Corrected volume flow: 📿 | -0.0001 NI/s |
| E Setup | Density: | 1000.0010 kg/m ³ |
| Diagnostics | Reference density: | 1000.0100 kg/Nm ³ |
| Expert | | |
| P□ Locking status: | Temperature: 🛛 🕄 | -1.0141 °C |
| P□ Access status display: Mainten | | |
| P□ Access status tooling: Mainten | | |
| P□ Enter access code: | | |
| 🕀 🛅 System | | |
| 🛱 🦢 Sensor | | |
| 🖨 🗁 Measured values | | |
| 😟 🛅 Process variables | | |
| 🕀 🛄 Totalizer | | |
| 😟 🗀 Output values | | |
| 🕀 🛄 System units | | |
| 🕀 🧰 Process parameters | | |
| 🕀 🧰 Measurement mode | | |
| 🕀 🧰 External compensation | | |
| 🕀 🧰 Calculated values | | |
| 🕀 🗀 Sensor adjustment 🗸 | | |
| | | |
| Online | Process v | variables |
| 😌 Connected 🛛 💭 🖳 👘 🖉 🖉 User | Role: Planning engineer | |

Figure 7.14 – Device DTM

8 **Diagnostics**

8.1 LEDs

The module provides six LEDs for diagnostics purposes as shown below. A description of each LED is given in the table below.



Figure 8.1 - PLX51-PBM LEDs

| LED | Description |
|-------|---|
| Ok | The module LED will provide information regarding the system-level operation of the module. Thus, if the LED is red then the module is not operating correctly. For example, if the module application firmware has been corrupted or there is a hardware fault the module will have a red Module LED. |
| | If the LED is green (flashing), then the module has booted and is running correctly without any application configuration loaded. |
| | If the LED is green (solid), then the module has booted and is running correctly with application configuration loaded. |
| A / B | The Ethernet LED will light up when an Ethernet link has been detected (by plugging in a connected Ethernet cable). The LED will flash every time traffic was detected. |
| | This module has two Ethernet ports A and B. Each LEDs represents each specific port. |
| Run | This LED will indicate the PROFIBUS operating mode when in Master mode (Note that in Slave mode this LED is N/A). |
| | Solid Red – The PROFIBUS network is in STOP mode. |
| | Flashing Green – The PROFIBUS network is in CLEAR mode. |
| | Solid Green – The PROFIBUS network is in OPERATE mode. |
| | Off - The PROFIBUS network is OFFLINE. |
| | Slave |
| | Off – For Slave mode this LED is N/A. |

| BF | This LED indicates the status of the PROFIBUS network when in Master mode and the status of the configured field devices when in Slave Mode. |
|-----|--|
| | Master |
| | Solid Red – There are bus communication errors |
| | Flashing Red – There are field device errors |
| | Off – There are no bus communication or device errors |
| | Slave |
| | Solid Red – There are bus communication errors (if no valid packet has been received by any configured slave for more than 1s). |
| | Flashing Red – There are slave errors (at least one slave has not been configured properly and is not exchanging DPV0 data). |
| | Flashing Green – All slaves are successfully exchanging DPV0 data and the DP network operational state is clear . |
| | Solid Green – All slaves are successfully exchanging DPV0 data and the DP network operational state is operate . |
| Aux | The activity LED is used for the activity on the Primary Interface (e.g. EtherNet/IP, Modbus RTU, or Modbus TCP). Thus, every time a valid packet is received from the Primary Interface the LED will toggle green. The LED will toggle red if a corrupted packet was received (e.g. failed checksum when using RS232 or RS485). |

8.2 Module Status Monitoring

The PLX51-PBM provides a range of statistics which can assist with module operation, maintenance, and fault finding. The statistics can be accessed in full by the PLX50 Configuration Utility or using the web server in the module.

To view the module's status in the PLX50 Configuration Utility environment, the PLX51-PBM must be online. If the module is not already Online (following a recent configuration download), then right-click on the module and select the *Go Online* option.

| Project Explorer | - 4 × |
|---|---------------------------------|
| ⊡ o₁ <new project=""></new> | |
| MyPLX51-PBM (PLYC1 | Configuration |
| Profibus Devices | Connection Path |
| [000] Device0 | Verify Configuration |
| +0 | Identity |
| 5 | Status |
| 46 | Go Offline |
| 1 | Go Online |
| + | Download |
| 1 | Upload |
| (B) | Save Configuration to SD Card |
| | DP Packet Capture |
| #° | Global Control |
| - in the second s | Modbus Packet Capture |
| 1 | Generate Status Report |
| ក | Сору |
| Ċ | Export |
| × | Delete |
| S | Import Legacy PCB Configuration |
| 3 | Generate Logix L5X |
| < 🖉 | Export Configuration File |
| Properties | Mapping Report |
| | Modbus Master Poll Report |
| Name MyPLX51-PE | Export Modbus Raw CSV |
| Description | Export Modbus Expanded CSV |
| Connection P; 192.168.1.178 | |

Figure 8.2 - Selecting to Go Online

The Online mode is indicated by the green circle behind the module in the Project Explorer tree.

8.2.1 PLX51-PBM Status Window

The Status monitoring window of the PLX51-PBM can be opened by either doubleclicking on the *Status* item in the Project Explorer tree, or by right-clicking on the module and selecting *Status*.

| Project Explorer | - д 🗙 | |
|--------------------------------------|--------------|---------------------------------|
| ⊡ro₁ <new project=""></new> | | |
| MyPLX51-PBM (PLX51- Configuration | | Configuration |
| Status | - | Connection Path |
| Event Viewer | V | Verify Configuration |
| ie en Profibus Devices | _ | |
| [000] Device001 | +0 | Identity |
| | n N | Status |
| | 1 | Go Offline |
| | 41- | Go Online |
| | ₽. | Download |
| | 1 | Upload |
| | 80 | Save Configuration to SD Card |
| | ž. | DP Packet Capture |
| | £ | Global Control |
| | J. | Modbus Packet Capture |
| | 5 | Generate Status Report |
| | Ū, | Сору |
| | C | Export |
| | X | Delete |
| | 8 | Import Legacy PCB Configuration |
| | 3 | Generate Logix L5X |
| < | | Export Configuration File |
| Properties | 5 | Mapping Report |
| | | Modbus Master Poll Report |
| Name MyPLX51-PBM | 5 | Export Modbus Raw CSV |
| Description | 5 | Export Modbus Expanded CSV |
| Connection Pi 192.168.1.178 | _ | |
| | | |

Figure 8.3 - Selecting PLX51-PBM online Status

The status window contains multiple tabs to display the current status of the module.

8.2.2 PLX51-PBM Master Mode Status

<u>General</u>

| MyPLX51-PBM - Status | | | | |
|----------------------------|---------------------------|------------------------------------|---------------------------|--|
| General General Statistics | DPV1 Statistics Live List | Discovered Nodes Modbus Statistics | Ethemet Clients TCP / ARP | |
| Config Valid | Valid | MAC Address | 00:0D:8D:20:00:25 | |
| Owned | n/a | Temperature | 48.0 °C | |
| Mode | StandaloneMaster | Processor Scan | 16.0 us | |
| Profibus State | Operational | Ethernet Port 1 | Down | |
| Master Node | 1 | Ethernet Port 2 | Up | |
| BAUD Rate | 93.75 | Ethemet DLR | Disabled | |
| IO bytes/second | 3904 | NTP Status | Disabled | |
| Acyclic Requests Pending | 0 | SD Card | None | |
| Up Time | Up Time 8d - 00:59:04 | | Safe Mode Off | |
| Firmware Revision | 1.001.034 |] SW2 - | Force DHCP Off | |
| Configuration Signature | 0xCA80 |] SW3 - | Config. Lock Off | |
| | | SW4 - | Fixed IP Address Off | |
| | | | | |

The General tab displays the following general parameters:

Figure 8.4 - PLX51-PBM (Master Mode) General parameters

| Parameter | Description |
|--------------------------------------|---|
| Config Valid | Indicates if the downloaded configuration is valid and executing. |
| Owned | Indicates whether or not the module is currently owned (Class 1) by a Logix Controller. |
| Mode | This is the mode of operation of the module. The following states can be returned: |
| | Quiet: This mode allows the user to connect the PLX51-PBM to an active bus and run a DP packet capture. In this mode the PLX51-PBM will not communicate on the DP Bus but rather only listen. |
| | Standalone: In this mode the PLX51-PBM is the DP Master on the PROFIBUS network. |
| | Slave: In this mode the PLX51-PBM will emulate multiple PROFIBUS Slave devices. |
| PROFIBUS State (Master mode only) | This is the operational state of the PROFIBUS network. The following states can be returned: |
| | OFFLINE: The PROFIBUS network is offline and the PLX51-PBM will not communicate on the network. |
| | STOP: The PROFIBUS network is running and the PLX51-PBM is communicating on the network, but it will not exchange any process data with |
| | any slave device. |
| | OPERATE: The PROFIBUS network is running and the PLX51-PBM is communicating with all slave devices on the network, and if configured in the PLX51-PBM, the module will configure and exchange process data with each slave device. |
| | CLEAR: The PROFIBUS network is running and the PLX51-PBM is communicating with all slave devices on the network, and if configured in the PLX51-PBM, the module will configure and exchange process data with each slave device. |

| Table 8.2 - Parameters displayed in the Status | Monitoring – General Tab |
|--|--------------------------|
|--|--------------------------|

| | NOTE : In CLEAR mode the PLX51-PBM will not send any output data to any slave device. |
|-----------------------------------|---|
| Master Node (Master mode only) | The PROFIBUS Node address of the local PLX51-PBM when in Master mode. |
| BAUD Rate | The BAUD Rate of the PROFIBUS network. |
| IO bytes/second | The number of process variable bytes being exchanged between the PLX51- PBM and slave devices every second. |
| Acyclic Requests Pending | The number of acyclic requests (DPV1 Class 1 and Class 2 requests) pending. |
| Up Time | Indicates the elapsed time since the module was powered-up. |
| Firmware Revision | The application firmware revision currently executing. |
| Configuration Signature | The signature of the configuration currently executing on the module. |
| MAC Address | Displays the module's unique Ethernet MAC address. |
| Temperature | The internal temperature of the module. |
| Processor Scan | The amount of time (microseconds) taken by the module's processor in the last scan. |
| Ethernet Port 1/2 | This is the status of each Ethernet port. |
| | Down: The Ethernet connector has not been successfully connected to an Ethernet network. |
| | Up: The Ethernet connector has successfully connected to an Ethernet network. |
| | Mirror Enabled: The Ethernet port is mirroring the traffic on the other Ethernet port. |
| Ethernet DLR | The status of the Ethernet DLR. |
| (Device Level Ring) | Disabled - Device Level Ring functionality has been disabled. |
| | Linear - The DLR functionality has been enabled and the Ethernet network architecture is linear. |
| | Ring – Fault: The DLR functionality has been enabled and the Ethernet network architecture is ring, but there is a fault with the network. |
| | Ring – Ok: The DLR functionality has been enabled and the Ethernet network architecture is ring and is operating as expected. |
| NTP Status | The status of the local NTP Client. |
| | Disabled: The NTP time synchronization has been disabled. |
| | Locked: NTP time synchronization has been enabled and the PLX51-PBM has locked onto the target time server. |
| | Not Locked: NTP time synchronization has been enabled and the PLX51- PBM has not locked onto the target time server. |
| DIP Switch Position | The status of the DIP switches when the module booted. |
| | |

General Statistics

The General Statistics (PLX51-PBM Master mode only) tab displays the following general parameters:

| neral | General Statistics | DPV1 Statistics | Live List | Discovered Nodes | Modbus Statistics | Ethernet Clients | TCP / ARP | | |
|-------|----------------------|-----------------|-----------|------------------|-------------------|-------------------|------------|-------|-------|
| | 1 | J | | | 1 | 1 | | | |
| DP S | statistics | | | | | | | | |
| | Cour | nter | | Value | | Counter | | Value | Clear |
| Т | x Packet Count | | | 3 938 071 | FB Fault C | ount | | 0 | |
| F | Rx Packet Count | | | 697 685 | Device Fa | ult Count | | 0 | |
| C | Checksum Failed Pa | acket Count | | 0 | Acyclic Re | quest Client Cour | nt Overrun | 0 | |
| N | lo Reply Count | | | 0 | Token Pas | s Retry Count | | 0 | |
| S | Set Slave Addr Tx C | ount | | 0 | Token Pas | s Fail Count | | 0 | |
| S | Set Slave Addr Rx C | Count | | 0 | Unexpecte | d Packet Receive | ed | 0 | |
| S | et Slave Addr Err (| Count | | 0 | FB Inactivi | ty Count | | 2 | |
| 0 | Global Ctrl Tx Count | t | | 57 006 | Duplicate | Station Detect Co | unt | 0 | |
| 0 | Global Ctrl Rx Coun | t | | 0 | Invalid Res | sponse Length Co | ount | 0 | |
| L | ast Profibus Cycle. | Time (us) | | 18 025 | FDL Fault | Count | | 0 | |
| N | Max Profibus Cycle | Time (us) | | 22 700 | Extract Ala | rm Success Cour | nt | 0 | |
| Ν | Iin Profibus Cycle | Time (us) | | 13 438 | Extract Ala | rm Fail Count | | 0 | |
| L | ast Token Hold Tir. | ne (us) | | 38 435 | Initialize Pa | arameter Set Suc | cess Count | 0 | |
| N | Nax Token Hold Tin | ne (us) | | 69 923 | Initialize Pa | arameter Set Fail | Count | 0 | |
| Ν | /lin Token Hold Tim | ie (us) | | 11 031 | Device Re | configure Count | | 2 | |
| L | ast Response Time | e (us) | | - | Device Re | parameterize Cou | unt | 2 | |
| N | Max Response Time | e (us) | | - | Ext Diag C | verflow Count | | 0 | |

Figure 8.5 – PLX51-PBM (Master Mode) Status monitoring – General Statistics

| Parameter | Description |
|------------------------------|---|
| Tx Packet Count | The number of PROFIBUS packets transmitted. |
| Rx Packet Count | The number of PROFIBUS packets received. |
| Checksum Failed Packet Count | The number of PROFIBUS packets that had a failed checksum. |
| No Reply Count | The number of PROFIBUS requests from the PLX51-PBM where the station did not respond. |
| Set Slave Addr Tx Count | The number of PROFIBUS Set Slave Address requests sent from the PLX51-PBM. |
| Set Slave Addr Rx Count | The number of successful PROFIBUS Set Slave Address responses received. |
| Set Slave Addr Err Count | The number of failed PROFIBUS Set Slave Address responses received. |
| Global Ctrl Tx Count | The number of PROFIBUS Global Control requests sent from the PLX51-PBM. |
| Global Ctrl Rx Count | The number of PROFIBUS Global Control responses received by the PLX51-PBM. |
| Last PROFIBUS Cycle Time | The time (in microseconds) the last PROFIBUS Cycle took to complete. |
| Max PROFIBUS Cycle Time | The maximum time (in microseconds) the PROFIBUS Cycle took to complete. |
| Min PROFIBUS Cycle Time | The minimum time (in microseconds) the PROFIBUS Cycle took to complete. |
| Last Token Hold Time | The time (in microseconds) the PLX51-PBM held the token in the last token rotation. |
| Max Token Hold Time | The maximum time (in microseconds) the PLX51-PBM held the token. |

Table 8.3 - Parameters displayed in the Status Monitoring – General Statistics Tab

| Min Token Hold Time | The minimum time (in microseconds) the PLX51-PBM held the |
|---|---|
| | token. |
| Last Response Time | In a Multi DP Master system, this is the time it took (in microseconds) to respond to the last token passed from another DP Master. |
| Max Response Time | In a Multi DP Master system, this is the maximum time it took (in microseconds) to respond to a token passed from another DP Master. |
| Min Response Time | In a Multi DP Master system, this is the minimum time it took (in microseconds) to respond to a token passed from another DP Master. |
| FB Fault Count | The number of fieldbus faults that have occurred (e.g. devices going offline, corrupted packets, etc.) |
| Device Fault Count | The number of slave device faults that have occurred (e.g. device stops communicating during data exchange). |
| Acyclic Request Client Count Overrun | The number of times more than 10 acyclic requests needed to be buffered in which case the PLX51-PBM will reject the 11 th request. |
| Token Pass Retry Count | In a Multi DP Master system, this is the number of times the token pass from the PLX51-PBM had to be retransmitted because the receiving DP Master did not respond in time. |
| Token Pass Fail Count | When the number of consecutive Token Pass Retries reaches the configured token pass retry count after which that DP Master will be assumed as offline. |
| Unexpected Packet Received | The number of times a response is received from a slave device that was not expected (e.g. incorrect response, response from a different node, etc.). |
| FB Inactivity Count | The number of times the PLX51-PBM has determined that there are no other DP Masters on the PROFIBUS network. |
| Duplicate Station Detect Count | The number of times the PLX51-PBM has detected that there is another station on the network with the same station address as the local PLX51-PBM. |
| Invalid Response Length Count | The number of times a response is received from a slave device where the length is not correct (for example if the slave device is configured to provide 10 bytes of process data and only 5 bytes are returned during data exchange). |
| FDL Fault Count | The number of Data Link Layer function code faults received. This occurs when the remote PROFIBUS device rejects a function request, e.g. if the device is not in the correct state, or if it does not support that function. A list of FDL errors is tabulated in chapter 9. |
| Extract Alarm Success Count | The number of alarms that have successfully been extracted from slave devices. |
| Extract Alarm Fail Count | The number of alarms that have not successfully been extracted from slave devices. |
| Initialize Parameter Set Success Count | The number of parameters that have successfully been set after the device has been configured for data exchange. |
| Initialize Parameter Set Fail Count | The number of parameters that have failed to set after the device has been configured for DPV0 data exchange. |
| Device Reconfigure Count | The number of times a slave device has been (re)configured for DPV0 data exchange. |
| Device Reparameterize Count | The number of times a slave device has been (re)parameterized for DPV0 data exchange. |
| Ext Diag Overflow Count | The number of times a slave device has returned diagnostics data that could not fit into a single PROFIBUS frame. |

DPV1 Statistics

The DPV1 Statistics (PLX51-PBM Master mode only) tab displays the following general parameters:

| Genera | I General Statistics | DPV1 Statistics | Live List Discovered Nodes | Modbus Statistics | Ethernet Clients | TCP / ARP | |
|--------|----------------------|-----------------|----------------------------|-------------------|------------------|-----------|--|
| | | | | | | | |
| DP | V1 Statistics | | | | | | |
| | Соц | inter | Value | Clear | | | |
| | DPV1 Class 1 Read | Tx Count | 0 | | | | |
| | DPV1 Class 1 Read | Rx Count | 0 | | | | |
| | DPV1 Class 1 Read | Err Count | 0 | | | | |
| | DPV1 Class 1 Write | Tx Count | 0 | | | | |
| | DPV1 Class 1 Write | Rx Count | 0 | | | | |
| | DPV1 Class 1 Write | Err Count | 0 | | | | |
| | DPV1 Class 2 Init To | Count | 0 | | | | |
| | DPV1 Class 2 Init R | x Count | 0 | | | | |
| | DPV1 Class 2 Init Er | rr Count | 0 | | | | |
| | DPV1 Class 2 Abort | Tx Count | 0 | | | | |
| | DPV1 Class 2 Abort | Rx Count | 0 | | | | |
| | DPV1 Class 2 Read | Tx Count | 0 | | | | |
| | DPV1 Class 2 Read | Rx Count | 0 | | | | |
| | DPV1 Class 2 Read | Err Count | 0 | | | | |
| | DPV1 Class 2 Write | Tx Count | 0 | | | | |
| | DPV1 Class 2 Write | Rx Count | 0 | | | | |
| | DPV1 Class 2 Write | Err Count | 0 | | | | |

Figure 8.6 – PLX51-PBM (Master Mode) Status monitoring – DPV1 Statistics

| Parameter | Description |
|------------------------------|--|
| DPV1 Class 1 Read Tx Count | The number of PROFIBUS DPV1 Class 1 Read requests sent from the PLX51-PBM. |
| DPV1 Class 1 Read Rx Count | The number of successful PROFIBUS DPV1 Class 1 Read responses received by the PLX51-PBM. |
| DPV1 Class 1 Read Err Count | The number of failed PROFIBUS DPV1 Class 1 Read responses received by the PLX51-PBM. |
| DPV1 Class 1 Write Tx Count | The number of PROFIBUS DPV1 Class 1 Write requests sent from the PLX51-PBM. |
| DPV1 Class 1 Write Rx Count | The number of successful PROFIBUS DPV1 Class 1 Write responses received by the PLX51-PBM. |
| DPV1 Class 1 Write Err Count | The number of failed PROFIBUS DPV1 Class 1 Write responses received by the PLX51-PBM. |
| DPV1 Class 2 Init Tx Count | The number of PROFIBUS DPV1 Class 2 Initialize requests sent from the PLX51-PBM. |
| DPV1 Class 2 Init Rx Count | The number of successful PROFIBUS DPV1 Class 2 Initialize responses by the PLX51-PBM. |
| DPV1 Class 2 Init Err Count | The number of failed PROFIBUS DPV1 Class 2 Initialize responses received by the PLX51-PBM. |
| DPV1 Class 2 Abort Tx Count | The number of PROFIBUS DPV1 Class 2 Abort requests sent from the PLX51-PBM. |
| DPV1 Class 2 Abort Rx Count | The number of PROFIBUS DPV1 Class 2 Abort messages received by the PLX51-PBM. |
| DPV1 Class 2 Read Tx Count | The number of PROFIBUS DPV1 Class 2 Read requests sent from the PLX51-PBM. |
| DPV1 Class 2 Read Rx Count | The number of successful PROFIBUS DPV1 Class 2 Read responses received by the PLX51-PBM |

Table 8.4 - Parameters displayed in the Status Monitoring - DPV1 Statistics Tab

| DPV1 Class 2 Read Err Count | The number of failed PROFIBUS DPV1 Class 2 Read responses received by the PLX51-PBM. |
|------------------------------|---|
| DPV1 Class 2 Write Tx Count | The number of PROFIBUS DPV1 Class 2 Write requests sent from the PLX51-PBM. |
| DPV1 Class 2 Write Rx Count | The number of successful PROFIBUS DPV1 Class 2 Write responses received by the PLX51-PBM. |
| DPV1 Class 2 Write Err Count | The number of failed PROFIBUS DPV1 Class 2 Write responses received by the PLX51-PBM. |

Live List

The Live List tab in the PLX51-PBM (Master mode only) status monitoring provides the user with an overview of all slave devices and DP masters connected to the PROFIBUS network. Each station will be in one of six states that are provided in the Live List page.

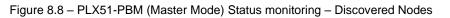
| - | ional of | atistics | | l Statisti | 103 211 | 0 2.01 | Discov | eleun | loues | Modbus Statistics | Ethernet Clients TCP / ARP |
|-------|----------|----------|-----|------------|---------|--------|--------|-------|-------|-------------------|----------------------------|
| fibus | DP Liv | ve List | | | | | | | | | |
| 0 | 1 M | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Key | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | X | Not Available |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | Not Available |
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | X | Live + Data Exchange |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | | |
| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | X | Live + Not Exchanging |
| 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | X | Configured + Not Live |
| 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | | Compared + Not Live |
| 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | XM | DP Master |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | | |
| 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | X | Unconfigured |
| 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | | |
| 120 | 121 | 122 | 123 | 124 | 125 | | | | | | |

Figure 8.7 – PLX51-PBM (Master Mode) Status monitoring – Live List

Discovered Nodes

The Discovered Nodes (PLX51-PBM Master mode only) status page provides the user with more detail regarding each station on the PROFIBUS network (when compared to the live list). The user can scan the PROFIBUS network to extract further details from each device. From here the user can add the slave device or change the slave device station address. See the *Device Discovery* section.

| | rery | Status | Done | | |
|---------|--------|--------------|----------------|------------------|--------------|
| Station | Ident | Status | Vendor | Model | GSD |
| 2 | 0x1523 | Data Exch | Endress+Hauser | ITEMP PA TMT 184 | EH3_1523.GSD |
| 3 | 0x155F | Unconfigured | | | |
| 15 | 0x04C2 | Unconfigured | | | |
| 16 | 0x80A6 | Unconfigured | | | |
| | | | | | |



Modbus Statistics

The Modbus Statistics tab displays the statistics associated with the Modbus communication and mapping.

| lodbus Statistics | | | | |
|--------------------|-------|-----------------------------|-------|-------|
| Counter | Value | Counter | Value | Clear |
| Tx Packet Count | 0 | Data Alignment Errors | 0 | |
| Rx Packet Count | 0 | Illegal Function | 0 | |
| Checksum Errors | 0 | Illegal Data Address | 0 | |
| Parity Errors | 0 | Illegal Data Value | 0 | |
| Timeout Errors | 0 | Slave Device Failure | 0 | |
| Data Too Large | 0 | Acknowledge - Reponse Delay | 0 | |
| Register Not Valid | 0 | Slave Device Busy | 0 | |
| Node Mismatch | 0 | Negative Acknowledge | 0 | |

Figure 8.9 – PLX51-PBM Master mode status monitoring – Modbus Statistics

| Statistic | Description |
|--------------------------------|---|
| Tx Packet Count | The number of Modbus packets sent by the module. |
| Rx Packet Count | The number of Modbus packets received by the module. |
| Checksum errors | The number of corrupted Modbus packets received by the module. |
| Parity errors | The number of bytes with parity errors received by the module. |
| Timeout Errors | The number of message response timeouts the module has encountered. |
| Data Too Large | The number of Modbus requests or responses where the data was too large to process. |
| Register Not Valid | The number of Modbus requests containing an invalid register. |
| Node Mismatch | The received Modbus request did not match the module's Modbus node address. |
| Data Alignment Errors | The Modbus request and associated mapped item is not byte aligned with the destination Logix tag. |
| Illegal Function | The number of times the Modbus device responded with an Illegal Function exception. |
| Illegal Data Address | The number of times the Modbus device responded with an Illegal Data Address exception. |
| Illegal Data Value | The number of times the Modbus device responded with an Illegal Data Value exception. |
| Slave Device Failure | The number of times the Modbus device responded with a Device Failure exception. |
| Acknowledge –Response Delay | The number of times the Modbus device responded with an Acknowledge exception. |
| Slave Device Busy | The number of times the Modbus device responded with a Slave Busy exception. |
| Negative Acknowledge | The number of times the Modbus device responded with a Negative Acknowledge exception. |

Table 8.5 – Modbus statistics

Modbus Devices

The Modbus Devices tab displays the active Modbus Client/Server devices the module is communicating with.

| MyPLX51-PBM - Status | | | | | | | | | | | | | | | Ξ | | | | |
|----------------------|----------------------|------------|-----|-----------|-------|-----------|------|--------|-------|------|---------|--------|-------|---------|-----|------------|---------|-------|-----|
| eneral G | General S | Statistics | DP\ | /1 Statis | stics | Live List | Disc | overed | Nodes | Mode | us Stat | istics | Modbu | s Devic | es | Ethernet (| Clients | TCP / | ARP |
| Modbus | Modbus Device Status | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 5 116 | 117 | 118 | 119 |
| 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 |
| 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 |
| 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 5 196 | 197 | 198 | 199 |
| 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 |
| 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | | | | | |

Figure 8.10 - PLX51-PBM Master mode status monitoring - Modbus Devices

Ethernet Clients

The Ethernet Clients tab displays details of the Ethernet and EtherNet/IP clients connected to the PLX51-PBM.

| M | yPLX51-PBM1 - Status | | | | | | | | | _ 🗆 🗙 |
|----|--------------------------|-----------------|-----------|------|---------------|--------------|-------|--------------------------|----|-------|
| Ge | neral General Statistics | DPV1 Statistics | Live List | Disc | overed Nodes | Modbus Stati | stics | Ethernet Clients TCP / A | RP | |
| | Ethernet Client Counts | | | | EtherNet/IP T | able | | | | |
| | Туре | | Count | | IP Address | | Ses | sion Handle | | |
| | ARP Clients | | 3 | | | | | | | |
| | TCP Clients | | 2 | | | | | | | |
| | EtherNet/IP Clients | | 0 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |



TCP/ARP

The TCP/ARP tab displays details of the internal Ethernet ARP and TCP lists of the PLX51-PBM.

| ral General Statistics | DPV1 Statistics Live List [| Discovered Nodes Modbus S | Statistics Ethernet Clie | nts TCP / ARP |
|------------------------|---------------------------------|---------------------------|--------------------------|---------------|
| RP Table | | TCP Table | | |
| MAC Address | IP Address | MAC Address | Remote Port | Local Port |
| 8:DB:F2:10:06:0F | 192.168.1.65 | 00:1D:9C:C4:2D:02 | 49697 | 44818 |
| 0:1D:9C:C4:2D:02 | 192.168.1.129 | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Figure 8.12 - PLX51-PBM (Master mode) status monitoring - Ethernet TCP / ARP Statistics

8.2.3 PLX51-PBM Slave Mode Status

<u>General</u>

The General tab displays the following general parameters. For more information, please see page 159.

| MyPLX51-PBM - Status | | | | |
|------------------------------|----------------------------------|--------------------------------------|--------------------------|--|
| General Slave Status EtherNe | et/IP Explicit Statistics EtherN | et/IP Devices Explcit Map Ethernet (| Clients TCP / ARP | |
| | | | | |
| Config Valid | Valid | MAC Address | 00:60:35:2D:BB:45 | |
| Owned | n/a | Temperature | 45.0 °C | |
| Mode | Slave | Processor Scan | 15.0 us | |
| Profibus State | n/a | Ethernet Port 1 | Down | |
| Master Node | n/a | Ethernet Port 2 | Up | |
| BAUD Rate | 1500 kbit/s | Ethernet DLR | Disabled | |
| IO bytes/second | 0 | NTP Status | Not Locked | |
| Acyclic Requests Pending | n/a | SD Card | None | |
| Up Time | 0d - 00:01:51 | DIP Switches SW | 1 - Safe Mode Off | |
| Firmware Revision | 1.001.036 | SW | 2 - Force DHCP Off | |
| Configuration Signature | 0xCBD0 | SW | 3 - Config. Lock Off | |
| | | SW | 4 - Fixed IP Address Off | |
| | | | | |

Figure 8.13 - PLX51-PBM (Slave Mode) General parameters

<u>Slave Status</u>

The PLX51-PBM Slave mode diagnostics tab displays the following parameters.

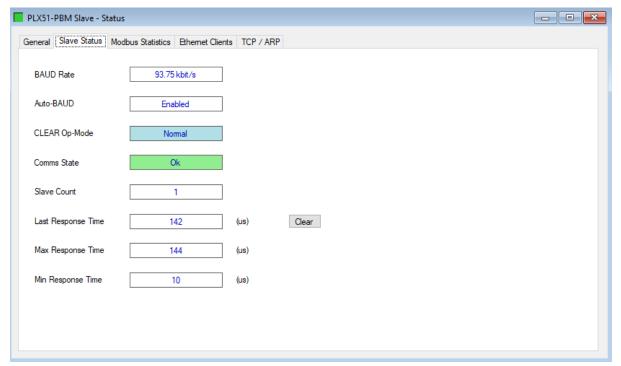


Figure 8.14 – PLX51-PBM (Slave Mode) Status monitoring

| Parameter | Description |
|--------------------|--|
| BAUD Rate | Current BAUD rate of the PROFIBUS Network |
| Auto-BAUD | If the BAUD rate for the PROFIBUS Network will be automatically detected |
| CLEAR Op-Mode | If the operational state of the PROFIBUS Network is CLEAR |
| Comms State | OK All configured slaves are operating correctly. |
| | Failure At least one of the configured devices are not operating correctly. |
| Slave Count | Number of slaves configured |
| Last Response Time | The time it took (in microseconds) to respond to the last request from a DP Master. |
| Max Response Time | The maximum time it took (in microseconds) to respond to a request from a DP Master. |
| Min Response Time | The minimum time it took (in microseconds) to respond to a request from a DP Master. |

Modbus Statistics

The Modbus Statistics tab displays the statistics associated with the Modbus communication and mapping. For more information, please see page 165.

| ral Slave Status Modbus Statis | tics Ethernet Clients TCP / AF | 3P | |
|--------------------------------|--------------------------------|-----------------------------|-------|
| Counter | Value | Counter | Value |
| Tx Packet Count | 1168920 | Data Alignment Errors | 0 |
| Rx Packet Count | 1168920 | Illegal Function | 0 |
| Checksum Errors | 0 | Illegal Data Address | 0 |
| Parity Errors | 0 | Illegal Data Value | 0 |
| Timeout Errors | 0 | Slave Device Failure | 0 |
| Data Too Large | 0 | Acknowledge - Reponse Delay | 0 |
| Register Not Valid | 0 | Slave Device Busy | 0 |
| Node Mismatch | 0 | Negative Acknowledge | 0 |

Figure 8.15 – PLX51-PBM Slave mode status monitoring – Modbus Statistics

Modbus Devices

The Modbus Devices tab displays the active Modbus Client/Server devices the module is communicating with.

| MyPLX | (51-PI | BM - | Status | | | | | | | | | | | | | | | C | - 6 | |
|--------|--------|---------|-----------|-------|-----------|-------|-----------|------|--------|-------|------|----------|--------|-------|---------|-----|------------|---------|-------|-----|
| eneral | Gen | neral S | tatistics | B DP\ | /1 Statis | stics | Live List | Disc | overed | Nodes | Mode | ous Stat | istics | Modbu | s Devic | es | Ethernet (| Clients | TCP / | ARP |
| Mod | bus De | evice | Status | | | | | | | | | | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 2 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 4 | 0 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 6 | 0 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 8 | 0 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| 1 | 00 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 5 116 | 117 | 118 | 119 |
| 1 | 20 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 5 136 | 137 | 138 | 139 |
| 14 | 40 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 5 156 | 157 | 158 | 159 |
| 1 | 60 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 5 176 | 177 | 178 | 179 |
| 1 | 80 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 5 196 | 197 | 198 | 199 |
| 2 | 00 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 5 216 | 217 | 218 | 219 |
| 2 | 20 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 5 236 | 237 | 238 | 239 |
| 2 | 40 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | | | | | |

Figure 8.16 – PLX51-PBM Master mode status monitoring – Modbus Devices

EtherNet/IP Explicit Statistics

The EtherNet/IP Explicit Statistics tab displays the statistics for the combined EtherNet/IP target devices when the *Primary Interface* has been set to *EtherNet/IP Explicit Messaging*.

| vPLX51-PBM - Status | | | | | | |
|--|--------------------------|-------------|------------------|-----------|--|--|
| neral Slave Status EtherNet/IP Explicit Statis | tics EtherNet/IP Devices | Explcit Map | Ethernet Clients | TCP / ARP | | |
| EtherNet/IP Explicit Statistics | | | | | | |
| Counter | Value | Clear | 1 | | | |
| Read Successes | value 33 | Clear | | | | |
| Write Successes | 0 | | | | | |
| Transactions Failed | 0 | | | | | |
| Transaction Timeouts | 0 | | | | | |
| Callback Id Mismatch | 0 | | | | | |
| Map Range Overrun | 0 | | | | | |
| Map Length Overrun | 0 | | | | | |
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Figure 8.17 - PLX51-PBM Slave mode status monitoring - EtherNet/IP Explicit Statistics

| Parameter | Description |
|----------------------|--|
| Read Successes | The number of successful Explicit EtherNet/IP read message transactions. |
| Write Successes | The number of successful Explicit EtherNet/IP write message transactions. |
| Transactions Failed | The number of failed Explicit EtherNet/IP message transactions. For example, if the target EtherNet/IP device responded with an error. |
| Transaction Timeouts | The number of times the target EtherNet/IP device did not respond within the configured timeout time. |
| Callback Id Mismatch | The received response from the EtherNet/IP device does not match the request sent. |
| Map Range Overrun | The response is larger than the upper limit of the Data Table. |
| Map Length Overrun | The response is larger than the configured expected response size. |

| Table 8.7 - Parameters displayed in the Status Monitoring – EtherNet/IP Explicit Statistics |
|---|
|---|

EtherNet/IP Devices

This shows all the configured EtherNet/IP devices used for Explicit EtherNet/IP Messaging and the current communication status. **Green** being online and exchanging data, **Red** indicating that the target device is offline.

| MyPLX5 | 51-PBM - Stat | tus | | | | | | |
|---------|------------------|---------------------------------|---------------------|-------------|------------------|-----------|--|--|
| General | Slave Status | EtherNet/IP Explicit Statistics | EtherNet/IP Devices | Explcit Map | Ethernet Clients | TCP / ARP | | |
| Ether | rNet/IP Explicit | Devices | | | | | | |
| | | Target Name | | Path | | | | |
| | | PowerFlex700 | 192 | .168.1.161 | | | | |
| | | | | | | | | |
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Figure 8.18 – PLX51-PBM Slave mode status monitoring – EtherNet/IP Devices

Explicit Map

This shows all the mapped EtherNet/IP explicit messaged used for Explicit EtherNet/IP Messaging. Each time there is a successful transaction the *Count* will increase and the item will briefly go green.

| MyPLX51-PBM - Status | | | | | |
|---|-----------------|--------------------------------------|--------------------|-------|-------|
| eneral Slave Status EtherNet/IP Explicit Statis | tics EtherNet/I | P Devices Explcit Map Ethernet Clien | ts TCP / ARP | | |
| EtherNet/IP Explicit Map Items | | | | | |
| Device | Scan | Function | Object (C:I:A) | Count | Clear |
| PowerFlex700 | А | Get | 0x0001 : 01 : 0001 | 355 | |
| | | | | | |
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Figure 8.19 – PLX51-PBM Slave mode status monitoring – Explicit Map

Ethernet Clients

The Ethernet Clients tab displays details of the Ethernet and EtherNet/IP clients connected to the PLX51-PBM.

| PLX51-PBM Slave - Status eneral Slave Status Modbus Sta | tistics Ethernet Clients | TCP / ARP | |
|--|--------------------------|-------------------|----------------|
| Ethernet Client Counts | | EtherNet/IP Table | |
| Туре | Count | IP Address | Session Handle |
| ARP Clients | 1 | | |
| TCP Clients | 1 | | |
| EtherNet/IP Clients | 0 | | |

Figure 8.20 – PLX51-PBM (Slave mode) status monitoring – Ethernet Client Statistics

TCP/ARP

The TCP/ARP tab displays details of the internal Ethernet ARP and TCP lists of the PLX51-PBM.

| PLX51-PBM Slave - Status eneral Slave Status Modbus | s Statistics Ethernet Clients | TCP / ARP | | |
|--|-------------------------------|-------------------|-------------|------------|
| ARP Table | | TCP Table | | |
| MAC Address | IP Address | MAC Address | Remote Port | Local Port |
| | 192.168.1.13 | 00:0C:29:70:BF:66 | 55101 | 44818 |

Figure 8.21 - PLX51-PBM (Slave mode) status monitoring - Ethernet TCP / ARP Statistics

8.2.4 PROFIBUS Slave Status

The Status monitoring window of each PROFIBUS slave device connected to the PLX51-PBM can be opened by right-clicking on the specific slave device in the PLX50 Configuration Utility tree and selecting *Status*.

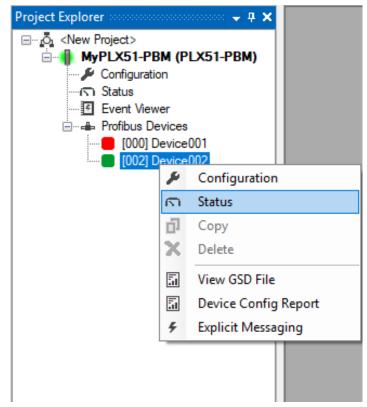


Figure 8.22 - Selecting slave device online Status

The device status window contains multiple tabs to display the current status of the specific slave device.

<u>General</u>

The General tab (for both PLX51-PBM Master and Slave modes) displays the following general parameters:

| MyPLX51-PBM - 18 | - Device Status | | |
|-----------------------|--------------------|----------------------|--------------------------|
| General Statistics St | andard Diagnostics | Extended Diagnostics | |
| Device Details | | | Device Status |
| Node Address | 18 | | Online |
| Instance Name | ET200MIM1532DF | PV1 | Data Exchange Active |
| Vendor | SIEMENS | | Enabled (PLC) |
| Model | ET 200M (IM153-2 | 2) DPV1, H, 1210 | Ident Mismatch |
| Identity | 0x0801E | | StationID Mismatch (PLC) |
| Revision | 5 | | CRC Mismatch (PLC) |
| | | | Error |
| | | | Alarm Pending |
| | | | Diagnostics Pending |
| | | | |

Figure 8.23 – PLX51-PBM (Master Mode) Device Status - General

| evice Details | | Device Status | Slave Mode Specific | |
|---------------|--------------------------|--------------------------|---------------------|--|
| Node Address | 2 | Online | Clear Op Mode | |
| Instance Name | PLX51PBM | Data Exchange Active | Alarm Ack | |
| Vendor | ProSoft Technology, Inc. | Enabled (Modbus) | | |
| Model | PLX51-PBM | Ident Mismatch | | |
| Identity | 0x010FE | StationID Mismatch (PLC) | | |
| Revision | 5 | CRC Mismatch (PLC) | | |
| | | Error | | |
| | | Alarm Pending | | |

Figure 8.24 – PLX51-PBM (Slave Mode) Device Status - General

| Table 8.8 - Device | Status Monitoring – General Tab |
|--------------------|--|
| Parameter | Description |
| Node Address | The selected slave device station address |
| Instance Name | The configured instance name of the device |
| Vendor | The device Vendor name |
| Model | The device Model name |
| Identity | The device PNO identity |
| Revision | The device revision |
| Device Status | The current status of the device: |
| | Ordina |
| | Online The slave device is online. |
| | Data Exchange Active |
| | The slave device is exchanging DPV0 process data with the |
| | PLX51-PBM. |
| | Disabled (PLC) |
| | The slave device has been disabled from DPV0 data exchange from the Logix controller using the PLX51-PBM output assembly. |
| | Identity Mismatch |
| | The device configured in the PLX50 Configuration Utility and the device online at the specific station address do not match. |
| | StationID Mismatch (PLC) |
| | The station address entered from the Logix controller using the PLX51-PBM output assembly does not match the station address of the configured slave device. |
| | CRC Mismatch (PLC) |
| | Indicates the mapping from the Logix controller does not match the configured mapping. |
| | Error |
| | Device Error flag |
| | Alarm Pending |
| | An alarm is pending in the specific slave device. |
| | Diagnostics Pending |
| | There is new diagnostics pending in the slave device. |

Statistics

The Statistics tab (for both PLX51-PBM Master and Slave modes) displays the following general parameters:

| al Statistics Standard Diagnostics Exter | nded Diagnostics | | | |
|--|------------------|----------------------------------|-------|-------|
| | | | | |
| ofibus Statistics | | | | |
| Counter | Value | Counter | Value | Clear |
| Tx Packet Count | 60,103 | DPV1 Class 2 Write Tx Count | 0 | |
| Rx Packet Count | 60,102 | DPV1 Class 2 Write Rx Count | 0 | |
| Checksum Failed Packet Count | 0 | DPV1 Class 2 Write Err Count | 0 | |
| No Reply Count | 0 | Set Slave Addr Tx Count | 0 | |
| DPV1 Class 1 Read Tx Count | 0 | Set Slave Addr Rx Count | 0 | |
| DPV1 Class 1 Read Rx Count | 0 | Set Slave Addr Err Count | 0 | |
| DPV1 Class 1 Read Err Count | 0 | Global Ctrl Tx Count | 0 | |
| DPV1 Class 1 Write Tx Count | 0 | Global Ctrl Rx Count | 0 | |
| DPV1 Class 1 Write Rx Count | 0 | Unexpected Packet Received | 0 | |
| DPV1 Class 1 Write Err Count | 0 | Invalid Response Length Count | 0 | |
| DPV1 Class 2 Init Tx Count | 0 | FDL Fault Count | 0 | |
| DPV1 Class 2 Init Rx Count | 0 | Extract Alarm Success Count | 0 | |
| DPV1 Class 2 Init Err Count | 0 | Extract Alarm Fail Count | 0 | |
| DPV1 Class 2 Abort Tx Count | 0 | Init Parameter Set Success Count | 0 | |
| DPV1 Class 2 Abort Rx Count | 0 | Init Parameter Set Fail Count | 0 | |
| DPV1 Class 2 Read Tx Count | 0 | Device Reconfigure Count | 1 | |
| DPV1 Class 2 Read Rx Count | 0 | Device Reparameterize Count | 1 | |
| DPV1 Class 2 Read Err Count | 0 | Ext Diag Overflow Count | 0 | |

Figure 8.25 - Device Status monitoring (PLX51-PBM Master mode) - Statistics

| fibus Statistics | | | | |
|------------------------------|------------|----------------------------------|-----------|-------|
| Counter | Value | Counter | Value | Clear |
| Tx Packet Count | 31,717,941 | DPV1 Class 2 Write Tx Count | 0 | |
| Rx Packet Count | 31,717,941 | DPV1 Class 2 Write Rx Count | 0 | |
| Checksum Failed Packet Count | 0 | DPV1 Class 2 Write Err Count | 0 | |
| No Reply Count | 0 | Set Slave Addr Tx Count | 0 | |
| DPV1 Class 1 Read Tx Count | 0 | Set Slave Addr Rx Count | 0 | |
| DPV1 Class 1 Read Rx Count | 0 | Set Slave Addr Err Count | 0 | |
| DPV1 Class 1 Read Err Count | 0 | Global Ctrl Tx Count | 0 | |
| DPV1 Class 1 Write Tx Count | 0 | Global Ctrl Rx Count | 1,484,081 | |
| DPV1 Class 1 Write Rx Count | 0 | Unexpected Packet Received | 0 | |
| DPV1 Class 1 Write Err Count | 0 | Invalid Response Length Count | 0 | |
| DPV1 Class 2 Init Tx Count | 0 | FDL Fault Count | 17 | |
| DPV1 Class 2 Init Rx Count | 0 | Extract Alarm Success Count | 0 | |
| DPV1 Class 2 Init Err Count | 0 | Extract Alarm Fail Count | 0 | |
| DPV1 Class 2 Abort Tx Count | 0 | Init Parameter Set Success Count | 0 | |
| DPV1 Class 2 Abort Rx Count | 0 | Init Parameter Set Fail Count | 0 | |
| DPV1 Class 2 Read Tx Count | 0 | Device Reconfigure Count | 12 | |
| DPV1 Class 2 Read Rx Count | 0 | Device Reparameterize Count | 12 | |
| DPV1 Class 2 Read Err Count | 0 | Ext Diag Overflow Count | 0 | |

Figure 8.26 – Device Status monitoring (PLX51-PBM Slave mode) – Statistics

| Table 8.9 - Device Status Monitoring – Statistics Tab | | | | |
|---|---|--|--|--|
| Parameter | Description | | | |
| Tx Packet Count | The number of PROFIBUS packets transmitted. | | | |
| Rx Packet Count | The number of PROFIBUS packets received. | | | |
| Checksum Failed Packet Count | The number of PROFIBUS packets that had a failed checksum. | | | |
| No Reply Count | The number of PROFIBUS requests from the PLX51-PBM (or DP Master if in Slave Mode) where the station did not respond. | | | |
| DPV1 Class 1 Read Tx Count | The number of PROFIBUS DPV1 Class 1 Read requests sent from the PLX51-PBM to the specific device. PLX51-PBM Slave mode: The number of DPV1 Class 1 Read responses sent by the specific device. | | | |
| DPV1 Class 1 Read Rx Count | The number of successful PROFIBUS DPV1 Class 1 Read responses received from the specific device. PLX51-PBM Slave mode: The number of DPV1 Class 1 Read requests received by the specific device. | | | |
| DPV1 Class 1 Read Err Count | The number of failed PROFIBUS DPV1 Class 1 Read responses received from the specific device. (N/A for PLX51-PBM Slave mode) | | | |
| DPV1 Class 1 Write Tx Count | The number of PROFIBUS DPV1 Class 1 Write requests sent from the PLX51-PBM to the specific device. PLX51-PBM Slave mode: The number of DPV1 Class 1 Write responses sent by the specific device. | | | |
| DPV1 Class 1 Write Rx Count | The number of successful PROFIBUS DPV1 Class 1 Write responses received from the specific device. PLX51-PBM Slave mode: The number of DPV1 Class 1 Write requests received by the specific device. | | | |
| DPV1 Class 1 Write Err Count | The number of failed PROFIBUS DPV1 Class 1 Write responses received from the specific device. (N/A for PLX51-PBM Slave mode) | | | |
| DPV1 Class 2 Init Tx Count | (PLX51-PBM Master mode only) The number of PROFIBUS DPV1 Class 2 Initialize requests sent from the PLX51-PBM to the specific device. | | | |
| DPV1 Class 2 Init Rx Count | (PLX51-PBM Master mode only) The number of successful PROFIBUS DPV1 Class 2 Initialize responses received from the specific device. | | | |
| DPV1 Class 2 Init Err Count | (PLX51-PBM Master mode only) The number of failed PROFIBUS DPV1 Class 2 Initialize responses received from the specific device. | | | |
| DPV1 Class 2 Abort Tx Count | (PLX51-PBM Master mode only) The number of PROFIBUS DPV1 Class 2 Abort requests sent from the PLX51-PBM to the specific device. | | | |
| DPV1 Class 2 Abort Rx Count | (PLX51-PBM Master mode only) The number of PROFIBUS DPV1 Class 2 Abort messages received from the specific device. | | | |
| DPV1 Class 2 Read Tx Count | (PLX51-PBM Master mode only) The number of PROFIBUS DPV1 Class 2 Read requests sent from the PLX51-PBM to the specific device. | | | |
| DPV1 Class 2 Read Rx Count | (PLX51-PBM Master mode only) The number of successful PROFIBUS DPV1 Class 2 Read responses received from the specific device. | | | |
| DPV1 Class 2 Read Err Count | (PLX51-PBM Master mode only) The number of failed PROFIBUS DPV1 Class 2 Read responses received from the specific device. | | | |
| DPV1 Class 2 Write Tx Count | (PLX51-PBM Master mode only) The number of PROFIBUS DPV1 Class 2 Write requests sent from the PLX51-PBM to the specific device. | | | |

| DPV1 Class 2 Write Rx Count | (PLX51-PBM Master mode only) The number of successful PROFIBUS DPV1 Class 2 Write responses received from the |
|--|---|
| DPV1 Class 2 Write Err Count | specific device. (PLX51-PBM Master mode only) The number of failed |
| | PROFIBUS DPV1 Class 2 Write responses received from the specific device. |
| Set Slave Addr Tx Count | (PLX51-PBM Master mode only) The number of PROFIBUS Set Slave Address requests sent from the PLX51-PBM to the specific device. |
| Set Slave Addr Rx Count | (PLX51-PBM Master mode only) The number of successful PROFIBUS Set Slave Address responses received from the specific device. |
| Set Slave Addr Err Count | (PLX51-PBM Master mode only) The number of failed PROFIBUS Set Slave Address responses received from the specific device. |
| Global Ctrl Tx Count | PLX51-PBM Master Mode: The number of PROFIBUS Global Control requests sent from the PLX51-PBM to the specific device. |
| | PLX51-PBM Slave Mode: The number of PROFIBUS Global Control responses sent by the specific slave device. |
| Global Ctrl Rx Count | PLX51-PBM Master Mode: The number of PROFIBUS Global Control requests received by the PLX51-PBM from the specific device. |
| | PLX51-PBM Slave Mode: The number of PROFIBUS Global Control requests received by the specific slave device. |
| Unexpected Packet Received | The number of times a response is received from the device that was not expected (e.g. incorrect response, response from a different node, etc.). |
| Invalid Response Length Count | The number of times a response is received from the device where the length is not correct (for example if the device is configured to provide 10 bytes of process data and only 5 bytes are returned during data exchange). |
| FDL Fault Count | The number of Data Link Layer function code faults received from the specific device. |
| Extract Alarm Success Count | The number of alarms that have successfully been extracted from the specific device. |
| Extract Alarm Fail Count | The number of alarms that have not successfully been extracted from the specific device. PLX51-PBM Slave mode: N/A |
| Initialize Parameter Set Success Count | The number of parameters that have successfully been set after the device has been configured for data exchange for the specific device. |
| Initialize Parameter Set Fail Count | The number of parameters that have failed to set after the device has been configured for DPV0 data exchange for the specific device. |
| Device Reconfigure Count | The number of times the device has been (re)configured for DPV0 data exchange. |
| Device Reparameterize Count | The number of times the device has been (re)parameterized for DPV0 data exchange. |
| Ext Diag Overflow Count | The number of times the device has returned diagnostics data that could not fit into a single PROFIBUS frame. |

Standard Diagnostics

The Standard Diagnostics (PLX51-PBM Master mode only) tab displays the following general parameters:

| evice Status | | | | | |
|-----------------------|-----------------|----------------------------|------------------------|------------------------|--|
| | | Enumerated | | | |
| Class1 Node | 1 | Not Existent | Invalid Slave Response | Watchdog Active | |
| ldent | 0x0801E | Not Ready | Parameter Fault | Freeze Received | |
| Slave Rx Length | 0 | Configuration Fault | Other Master | Sync Received | |
| Slave Tx Length | 4 | Ext. Diagnostics Available | Parameter Request | Diagnostic Deactivated | |
| | | Function Not Supported | Static Diagnostic | Diagnostic Overflow | |
| - Dev: Diservention D | | | | | |
| Raw Diagnostics D | ata | | | | |
| 43 00 00 08 82 0 | 0 00 00 00 00 0 | 10 | | | |
| | | | | | |
| Set Paramater Resp | oonse E5 - | ACK Acknowledge | | | |
| Set Config Respons | | ACK Acknowledge | | | |

Figure 8.27 – Device Status monitoring – Standard Diagnostics

| Table 8.10 - D | Device Status Monitoring – Standard Diagnostics Tab |
|------------------------|--|
| Parameter | Description |
| Class 1 Node | The station address of the DP Master that configured the specific device for DPV0 communication. |
| Ident | The PNO Identification number of the device on the PROFIBUS network. |
| Slave Rx Length | The number of process data (DPV0) bytes expected from the device. |
| Slave Tx Length | The number of process data (DPV0) bytes that will be sent to the device. |
| Enumerated | Refer to the <i>PROFIBUS Specification EN 50170</i> for information regarding the diagnostics. |
| Raw Diagnostics Data | The raw diagnostics in a hexadecimal data string. |
| Set Parameter Response | This is the last response from the specific field device to the last set parameter telegram. |
| Set Config Response | This is the last response from the specific field device to the last check |

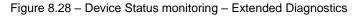
Table 8.10 - Device Status Monitoring – Standard Diagnostics Tab

Extended Diagnostics

The Extended Diagnostics (PLX51-PBM Master mode only) are decoded and displayed in a table form. The diagnostics are decoded using the pre-configured GSD file.

config telegram.

| PLX51-PBM - 18 - Device St | atus | | |
|-------------------------------|-----------------|---------------|----------------------------|
| eral Statistics Standard Diag | nostics Extende | d Diagnostics | |
| Extended Diagnostics | | | |
| Туре | Slot | Address | Description |
| PA | 1 | 16 | Error appears |
| PA | 1 | 25 | Hardware failure mechanics |
| PA | 1 | 29 | Measurement failure |
| PA | 1 | 37 | Maintenance required |
| PA | 1 | 55 | Extension Available |
| PA | 1 | 71 | Initialization active |



8.3 **PROFIBUS Packet Capture**

The module provides the capability to capture the PROFIBUS traffic for analysis. The will allow the user and the support team to view the packet stream. To invoke the capture of the module, double-click on the DP Packet Capture item in the Project Explorer tree.

| Project Explorer 🗸 🕂 🗙 | | | | | | | | | | |
|-----------------------------|--------------|----------------------------------|--|--|--|--|--|--|--|--|
| ⊡…o₁ <new project=""></new> | | | | | | | | | | |
| Event Viewer | | Configuration Connection Path | | | | | | | | |
| | \checkmark | Verify Configuration | | | | | | | | |
| [002] PLX51PBM | +0 | Identity | | | | | | | | |
| | n | Status | | | | | | | | |
| | 4 | Go Offline | | | | | | | | |
| | | Go Online | | | | | | | | |
| | | Download | | | | | | | | |
| | | Upload | | | | | | | | |
| | | Save Configuration to SD Card | | | | | | | | |
| | йn | DP Packet Capture | | | | | | | | |
| | ۶ | Global Control | | | | | | | | |
| | ŵ. | Modbus Packet Capture | | | | | | | | |
| | F. | Generate Statur Report | | | | | | | | |

Figure 8.29 - Selecting PROFIBUS Packet Capture

The DP Packet Capture window will open and automatically start capturing all PROFIBUS packets.

| | 🚸 MyPLX51-PBM - DP Packet Capture | | | | | | | | | | | | | | |
|-----|-----------------------------------|-----------|-------|--------|-----|------|----------|---------|---------|----------|-----|------|--|--|--|
| : E | | | | | | | | | | | | | | | |
| | Index | ▲ Time | Dirn. | Status | Src | Dest | Function | Details | Src SAP | Dest SAP | PDU | Data | | | |
| | | | | | | | | | | | | | | | |
| | Press STOP to view results. | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| С | apturing | Packets : | 936 | | | | | | | | | | | | |

Figure 8.30 - PROFIBUS packet capture

NOTE: The module will capture packets until the user presses *Stop* or when 10,000 DP packets have been reached.

When the capture process is stopped then the PROFIBUS capture will be presented as shown below.

| Index 🔺 | Time | Dirn. | Status | Src | Dest | Function | Details | Src SAP | Dest SAP | PDU | Data |
|---------|----------|-------|--------|-----|------|----------|----------------|---------|----------|-------------|----------------|
| 96 | 0.505445 | Тх | Ok | 1 | 73 | Request | Request FDL St | - | - | | 10 49 01 49 93 |
| 97 | 0.507238 | Tx | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 98 | 0.508246 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 99 | 0.509256 | Тх | Ok | 1 | 18 | Request | SRD - Priority | - | - | 7F 00 00 00 | 68 07 07 68 12 |
| 100 | 0.511083 | Rx | Ok | - | - | ACK | Acknowledge | - | - | | E5 |
| 101 | 0.511492 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 102 | 0.512496 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 103 | 0.513505 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 104 | 0.514513 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 105 | 0.515522 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 106 | 0.516530 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 107 | 0.517538 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 108 | 0.518546 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 109 | 0.519554 | Тх | Ok | 1 | 74 | Request | Request FDL St | - | - | | 10 4A 01 49 94 |
| 110 | 0.521346 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 111 | 0.522355 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 112 | 0.523363 | Тх | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |
| 113 | 0.524372 | Tx | Ok | 1 | 1 | Token | - | - | - | | DC 01 01 |



The captured PROFIBUS packets are tabulated as follows:

Table 8.11 - PROFIBUS Packet Capture fields

| Statistic | Description |
|-----------|--|
| Index | The packet index incremented for each packet sent or received. |
| Time | The time is measured in microseconds (us) and is started at a fraction of a second and continued until the packet capture is done. |
| Dirn. | The direction of the packet, either transmitted (Tx) or received (Rx). |
| Status | The status of the packet. Received packets are checked for valid PROFIBUS constructs and valid checksums. |
| Src | PROFIBUS node address of the message source. |
| Dest | PROFIBUS node address of the message destination. |
| Function | The PROFIBUS function (e.g. Token, Request, etc.) |
| Details | Additional details associated with the PROFIBUS command/function. |
| Src SAP | The source Service Access Point (SAP) when used. |
| Dest SAP | The destination Service Access Point (SAP) when used. |
| PDU | The PROFIBUS packet payload. |
| Data | The packet's raw data displayed in space delimited hex. |

The packet capture can be saved to a file for further analysis, by selecting the Save button on the toolbar. Previously saved PROFIBUS Packet Capture files can be viewed by selecting the *PROFIBUS Packet Capture Viewer* option in the tools menu.

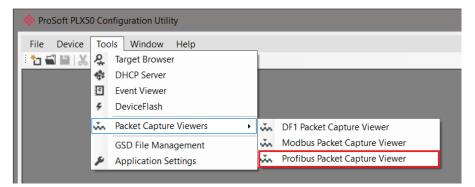


Figure 8.32 - Selecting the PROFIBUS Packet Capture Viewer

8.4 Modbus Packet Capture

The PLX51-PBM allows you to capture the Modbus traffic for analysis.

1 To invoke the capture of the module, right-click on the *PLX51-PBM* icon and double-click on the **MODBUS PACKET CAPTURE** item in the Project Explorer tree.

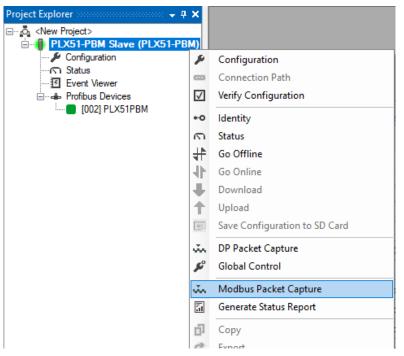


Figure 8.33 - Selecting Modbus Packet Capture

2 The *DP Packet Capture* window opens and automatically starts capturing all Modbus packets.

| 🔶 PL | X51-PBM | Slave - | Modbus Pa | cket Capture | e | | | | |
|------|---------|---------|-----------------|--------------|-----|------|-------------|------|--|
| 1 | × | 0 | | | | | | | |
| | Index | | Time | Status | Dim | Node | Description | Data | |
| | | | | | | | | | |
| | Pn | ess STO | OP to view resu | ults. | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Figure 8.34 - Modbus packet capture

NOTE: The module captures packets until you press the **STOP** button. If the packet capture reaches ~10,000 packets, it will automatically store the capture into a file, and will keep doing so for every 10,000 packets.

3 When the capture process is stopped, the Modbus capture is presented as shown below. It will keep capturing until you press **STOP**.

| <) 🔴 🕻 | 0 | | | | | |
|---------|-------------------|--------|-----|------|---|--|
| Index | ▲ Time | Status | Dim | Node | Description | Data |
| 554510 | 1d - 05:48:26.880 | Ok | Rx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A F4 81 24 81 24 81 24 81 24 81 24 81 24 81 24 |
| 554511 | 1d - 05:48:26.880 | Ok | Tx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A |
| 554512 | 1d - 05:48:26.880 | Ok | Rx | 3 | Read Coil - Address 0, Count 800 | 03 01 00 00 03 20 |
| 554513 | 1d - 05:48:26.880 | Ok | Tx | 3 | Read Coil - DataSize 100 | 03 01 64 01 02 00 00 04 00 00 00 00 00 00 00 00 00 00 |
| 554514 | 1d - 05:48:26.890 | Ok | Rx | 3 | Read HoldingReg - Address 200, Count 122 | 03 03 00 C8 00 7A |
| 554515 | 1d - 05:48:26.890 | Ok | Tx | 3 | Read HoldingReg - DataSize 244 | 03 03 F4 81 24 81 24 81 24 81 24 81 24 81 24 81 24 81 24 81 24 |
| 554516 | 1d - 05:48:27.890 | Ok | Rx | 3 | Read Coil - Address 0, Count 800 | 03 01 00 00 03 20 |
| 554517 | 1d - 05:48:27.890 | Ok | Тх | 3 | Read Coil - DataSize 100 | 03 01 64 01 02 00 00 04 00 00 00 00 00 00 00 00 00 00 |
| 554518 | 1d - 05:48:27.890 | Ok | Rx | 3 | Read HoldingReg - Address 200, Count 122 | 03 03 00 C8 00 7A |
| 554519 | 1d - 05:48:27.890 | Ok | Тх | 3 | Read HoldingReg - DataSize 244 | 03 03 F4 81 24 81 24 81 24 81 24 81 24 81 24 81 24 81 24 81 24 |
| 554520 | 1d - 05:48:27.890 | Ok | Rx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A F4 81 25 81 25 81 25 81 25 81 25 81 25 |
| 554521 | 1d - 05:48:27.890 | Ok | Tx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A |
| 554522 | 1d - 05:48:28.890 | Ok | Rx | 3 | Read HoldingReg - Address 200, Count 122 | 03 03 00 C8 00 7A |
| 554523 | 1d - 05:48:28.890 | Ok | Tx | 3 | Read HoldingReg - DataSize 244 | 03 03 F4 81 25 81 25 81 25 81 25 81 25 81 25 81 25 81 25 81 25 |
| 554524 | 1d - 05:48:28.890 | Ok | Rx | 3 | Read Coil - Address 0, Count 800 | 03 01 00 00 03 20 |
| 554525 | 1d - 05:48:28.890 | Ok | Tx | 3 | Read Coil - DataSize 100 | 03 01 64 01 02 00 00 04 00 00 00 00 00 00 00 00 00 |
| 554526 | 1d - 05:48:28.890 | Ok | Rx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A F4 81 25 81 25 81 25 81 25 81 25 81 25 |
| 554527 | 1d - 05:48:28.890 | Ok | Tx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A |
| 554528 | 1d - 05:48:29.890 | Ok | Rx | 3 | Read HoldingReg - Address 200, Count 122 | 03 03 00 C8 00 7A |
| 554529 | 1d - 05:48:29.890 | Ok | Тх | 3 | Read HoldingReg - DataSize 244 | 03 03 F4 81 25 81 25 81 25 81 25 81 25 81 25 81 25 81 25 81 25 |
| 554530 | 1d - 05:48:29.890 | Ok | Rx | 3 | Read Coil - Address 0, Count 800 | 03 01 00 00 03 20 |
| 554531 | 1d - 05:48:29.890 | Ok | Tx | 3 | Read Coil - DataSize 100 | 03 01 64 01 02 00 00 04 00 00 00 00 00 00 00 00 00 00 |
| 554532 | 1d - 05:48:29.890 | Ok | Rx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A F4 81 26 81 26 81 26 81 26 81 26 81 26 |
| 554533 | 1d - 05:48:29.890 | Ok | Tx | 3 | Write Mult. Reg - Address 2500, Count 122 | 03 10 09 C4 00 7A |
| 554534 | 1d - 05:48:30.890 | Ok | Rx | 3 | Read HoldingReg - Address 200, Count 122 | 03 03 00 C8 00 7A |
| 554535 | 1d - 05:48:30.890 | Ok | Tx | 3 | Read HoldingReg - DataSize 244 | 03 03 F4 81 26 81 26 81 26 81 26 81 26 81 26 81 26 81 26 81 26 |

Stopped Packets : 54

Figure 8.35 - Modbus Packet Capture complete

The captured Modbus values are tabulated as follows:

| Table 8.12 – Captured Modbus values | Table 8.12 – | Captured | Modbus values |
|-------------------------------------|--------------|----------|---------------|
|-------------------------------------|--------------|----------|---------------|

| Statistic | Description |
|-------------|--|
| Index | The packet index incremented for each packet sent or received. |
| Time | The time is started at a fraction of a second and continued until the packet capture is done. Time is based off the Up Time of the module. |
| Status | The status of the packet. Packets are checked for valid Modbus constructs and valid checksums. |
| Dirn. | The direction of the packet, either transmitted (Tx) or received (Rx). |
| Node | Modbus Slave ID |
| Description | Modbus Function Code, Database starting address, Count |
| Data | Modbus message construction, in HEX format. |

8.5 Module Event Log

The PLX51-PBM module logs various diagnostic records to an internal event log. These logs are stored in non-volatile memory and can be displayed using the PLX50 Configuration Utility or via the web interface. To view them in the PLX50 Configuration Utility, select the Event Viewer option in the Project Explorer tree.

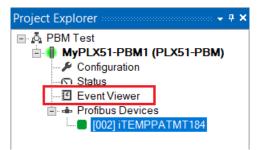


Figure 8.36. - Selecting the module Event Log

The Event Log window will open and automatically read all the events from the module. The log entries are sorted so as to have the latest record at the top. Custom sorting is achieved by double-clicking on the column headings.

| Uploade | ed 8 records. | | Filter (All) | ~ |
|---------|-------------------------|---------------|----------------------------------|---|
| Index - | Time | Up Time | Event | |
| 7 | 2018/11/23 06:39:13.860 | 0d - 00:03:49 | Application Config Valid | |
| 6 | 2018/11/23 06:38:33.110 | 0d - 00:03:09 | Fallback to Master Not Ready To | |
| 5 | 2018/11/23 06:38:30.110 | 0d - 00:03:06 | FB Operation Mode set to OPERATE | |
| 4 | 2018/11/23 06:38:22.810 | 0d - 00:02:58 | FB Operation Mode set to OFFLINE | |
| 3 | 2018/11/23 06:38:12.460 | 0d - 00:02:48 | Fallback to Master Not Ready To | |
| 2 | 2018/11/23 06:38:09.460 | 0d - 00:02:45 | FB Operation Mode set to OPERATE | |
| 1 | 2018/11/23 06:37:52.690 | 0d - 00:02:28 | FB Operation Mode set to OFFLINE | |
| 0 | 2018/11/23 06:36:01.820 | 0d - 00:00:37 | Log reset | |

Figure 8.37. – Module Event Log

The log can also be stored to a file for future analysis, by selecting the Save button in the tool menu.

To view previously saved files, use the Event Log Viewer option under the Tools menu.

8.6 Web Server

The PLX51-PBM provides a web server allowing a user without the PLX50 Configuration Utility, Logix, or Modbus device to view various diagnostics of the module.

NOTE: The web server is view **only** and thus no parameters or configuration can be altered from the web interface.

| Module: PLX51-PB | BM Serial: 352DBB41 Firmwo | are Rev: 1.1 | ProSoft* |
|------------------|----------------------------|-------------------|----------|
| Overview | Device Name | PLX51-PBM | |
| Ethernet | Serial number | 352DBB41 | |
| Event Logs | Firmware Revision | 1.1 | |
| Diagnostics | Vendor Id | 309 | |
| Application | Product Type | 12 | |
| Application | Product Code | 5228 | |
| | Uptime | 2h 15m 54s | |
| | Date | 1970/01/01 | |
| | Time | 02:15:56 | |
| | Temperature | 62.6223°C | |
| | Hardware MAC | 00:60:35:2D:BB:41 | |
| | System MAC | 00:60:35:2D:BB:41 | |
| | | 0.0.0.0 | |

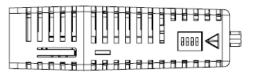
Figure 8.38 - Web interface

NOTE: The parameters and diagnostics in the webserver will match those in the PLX50 Configuration Utility status monitoring of the PLX51-PBM.

9 Technical Specifications

9.1 Dimensions

Below are the enclosure dimensions. All dimensions are in millimeters.



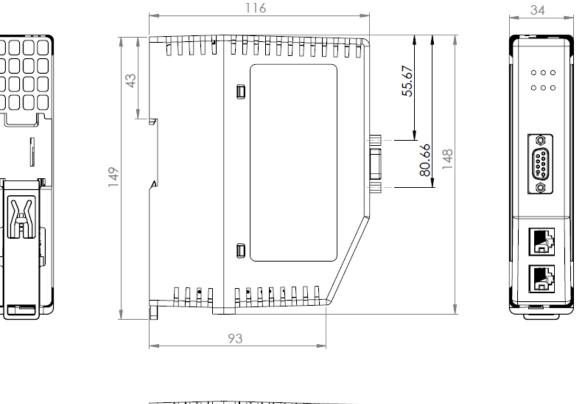




Figure 9.1 – PLX51-PBM enclosure dimensions

9.2 Electrical

Table 9.1 - Electrical specification

| Specification | Rating |
|-----------------------|------------------------------|
| Power requirements | Input: 10 – 36V DC |
| Power consumption | Maximum: 85mA @ 24V => 2.04W |
| Connector | 3-way terminal |
| Conductors | 24 – 18 AWG |
| Enclosure rating | IP20, NEMA/UL Open Type |
| Temperature | -20 – 70 °C |
| Earth connection | Yes, terminal based |
| Emissions | IEC61000-6-4 |
| ESD Immunity | EN 61000-4-2 |
| Radiated RF Immunity | IEC 61000-4-3 |
| EFT/B Immunity | EFT: IEC 61000-4-4 |
| Surge Immunity | Surge: IEC 61000-4-5 |
| Conducted RF Immunity | IEC 61000-4-6 |

9.3 EtherNet/IP

Table 9.2 - Ethernet specification

| Specification | Rating |
|--------------------|-------------------------|
| Connector | RJ45 |
| Conductors | CAT5 STP/UTP |
| ARP connections | Max 40 |
| TCP connections | Max 40 |
| CIP connections | Max 10 |
| Communication rate | 10/100Mbps |
| Duplex mode | Full/Half |
| Auto-MDIX support | Yes |
| Embedded switch | Yes, 2 x Ethernet ports |

9.4 Modbus TCP/IP

Table 9.3 – Modbus TCP/IP specification

| Specification | Rating |
|--------------------|------------------------------|
| Mode | Client or Server |
| Connector | RJ45 |
| Conductors | CAT5 STP/UTP |
| ARP connections | Max 40: 20 Client, 20 Server |
| Communication rate | 10/100Mbps |
| Duplex mode | Full / Half / Auto Negotiate |
| Auto-MDIX support | Yes |

9.5 PROFIBUS DP

Table 9.4 – PROFIBUS DP specification

| Specification | Rating |
|------------------------|--|
| Connector | Female DB9 connector |
| Conductor | See PROFIBUS DP Section. |
| DP Master Mode Support | DPV0 Data Exchange DPV1 Class 1 Messaging DPV1 Class 2 Messaging DPV1 Alarming |
| DP Slave Mode Support | DPV0 Data Exchange DPV1 Class 1 Messaging DPV1 Alarming |
| Isolated | Yes |
| BAUD Rate supported | 9.6 kbps 19.2 kbps 45.45 kbps 93.75 kbps 187.5 kbps 500 kbps 1.5 Mbps 3 Mbps 6 Mbps 12 Mbps |

9.6 Certifications

Please visit our website: www.prosoft-technology.com

10 PROFIBUS DP

10.1 Introduction

PROFIBUS is a vendor-independent, open fieldbus standard for a wide range of applications in manufacturing, process and building automation. Vendor independence and openness are guaranteed by the PROFIBUS standard EN 50 170. With PROFIBUS, devices of different manufacturers can communicate without special interface adjustments. PROFIBUS can be used for both high-speed time critical data transmission and extensive complex communication tasks. The PROFIBUS family consists of three compatible versions.

10.1.1 PROFIBUS DP

Optimized for high speed and inexpensive hookup, this PROFIBUS version is designed especially for communication between automation control systems and distributed I/O at the device level. PROFIBUS-DP can be used to replace parallel signal transmission with 24 V or 4-20 mA.

| OSI Layer | | PROFIBUS | | |
|-----------|--------------|----------|---------|------|
| 7 | Application | DPV0 | DPV1 | DPV2 |
| 6 | Presentation | | | |
| 5 | Session | | | |
| 4 | Transport | | | |
| 3 | Network | | | |
| 2 | Data Link | FDL | | |
| 1 | Physical | EIA-485 | Optical | MBP |

| Table 0.4 DDOCIDUS Dratesal | |
|-------------------------------|--|
| Table 9.1 – PROFIBUS Protocol | |

To utilize these functions, various service levels of the DP protocol were defined:

- DP-V0 provides the basic functionality of DP, including
 - cyclic data exchange,
 - o station, module and channel-specific diagnostics
- DP-V1 contains enhancements geared towards process automation, in particular
 - o acyclic data communication for parameter assignment
 - o alarm handling
- DP-V2 for isochronous mode and data exchange broadcast (slave-to-slave communication)

10.1.2 PROFIBUS PA

PROFIBUS PA is designed especially for process automation. It permits sensors and actuators to be connected on one common bus line through a dedicated DP/PA gateway or link between the PROFIBUS DP and PROFIBUS PA networks, even in intrinsically-safe areas. PROFIBUS PA permits data communication and power over the bus using a 2-wire technology according to the international standard IEC 1158-2.

10.1.3 PROFIBUS FMS

PROFIBUS FMS is the general-purpose solution for communication tasks at the cell level. Powerful FMS services open up a wide range of applications and provide great flexibility. PROFIBUS FMS can also be used for extensive and complex communication tasks. This protocol is the first developed for PROFIBUS, but it is no longer currently used.

PROFIBUS specifies the technical and functional characteristics of a serial fieldbus system with which decentralized digital controllers can be networked together from the field level to the cell level.

10.2 PROFIBUS Master and Slave

PROFIBUS distinguishes between master devices and slave devices.

Master devices determine the data communication on the bus. A master can send messages without an external request when it holds the bus access rights (the token). Masters are also called '**active stations**' in the PROFIBUS protocol.

Slave devices are peripheral devices. Typical slave devices include input/output devices, valves, drives and measuring transmitters. They do not have bus access rights and they can only acknowledge received messages or send messages to the master when requested to do so. Slaves are also called '**passive stations**'.

10.3 PROFIBUS Master Class 1 (DPM1) or class 2 (DPM2)

10.3.1 PROFIBUS DP Master class 1 (DPM1)

A class 1 master handles the normal communication or exchange of data with the slaves assigned to it. This is typically a PLC.

It uses **cyclic communication** to exchange process data with its associated slaves. The class 1 master sets the baud rate and the slave's auto-detect this rate. Each slave device is assigned to one master and only that master may write output data to that slave. Other masters may read information from any slave but can only write output data to their own assigned slaves.

10.3.2 PROFIBUS DP Master class 2 (DPM2)

A class 2 master is a special device primarily used for commissioning slaves and for diagnostic purposes. This is typically a Supervisor. It uses **acyclic communication** over what is known as the **MS2 channel**. A DPM2 does not have to be permanently connected to the bus system.

10.4 Cyclic Communication

The DP master class 1 cyclically exchanges data with all of the slaves assigned to it. This service is configured. During the configuration process, master and slave addresses are assigned, the bus parameters are defined, the types and numbers of modules (in the case of modular slaves) are specified, user-selectable parameter choices are made, etc.

Before data exchange can take place, the master will send parameterization and configuration telegrams to all of its assigned slaves. These parameters and configuration data are checked by the slaves. If both are valid, the master will initiate cyclic I/O data communication with the slave devices.

10.5 Acyclic Communication

In addition to the cyclic data exchange, the PROFIBUS protocol has the option of acyclic communication. This service is not configured. There are 2 different communication channels possible between the requested master and the slave:

- **MS1 channel** (MS1 connection): can only be established if cyclic data exchange is taking place between that master (DPM1) and the slave
- **MS2 channel** (MS2 connection): is possible with several masters simultaneously, but the connection must be established explicitly by the master.

Acyclic reading and writing of data requires an established MS1 or MS2 connection.

For the MS1 channel, 3 conditions must be satisfied:

- The slave device must support the MS1 channel (key C1_Read_Write_supp at 1 in the GSD file)
- The DPV1_enable bit must be set during the parameter assignment
- Data exchange is taking place

For the MS2 channel, the connection must be explicitly initiated by the master. The maximum number of possible MS2 connections to the slave must not be reached. The connection can be closed by either the master or the slave device.

10.6 Topology of PROFIBUS DP

PROFIBUS devices are connected in a bus structure. Up to 32 stations (master or slaves) can be connected in one segment. The bus is terminated by an active bus terminator at the beginning and end of each segment. Both bus terminations must always be powered. When more than 32 stations are used, repeaters (line amplifiers) must be used to connect the individual bus segments.

10.7 PROFIBUS DP Cable Description

Only one type of cable can be used for PROFIBUS network:

Table 9.2 – PROFIBUS DP network cable

| Parameter | Туре А |
|-----------------|------------------------------|
| Surge Impedance | 135 to 165Ω (3 to 20 MHz) |
| Capacity | <30 pF/m |
| Loop Resistance | <110 Ω/km |
| Wire gauge | >0.64 mm |
| Conductor area | >0.34 mm ² |

The maximum cable length depends on the transmission speed and cable type. The specified cable length can be increased using the repeaters. The use of more than 3 repeaters in series is not recommended.

| Table 9.3 – | PROFIBUS DP | cable length |
|-------------|-------------|--------------|
| 10010-0.0 | | cable length |

| Baudrate (kbps) | 9.6 | 19.2 | 93.75 | 187.5 | 500 | 1500 | 3000- 12000 |
|-----------------|------|------|-------|-------|-----|------|----------------|
| Length A (m) | 1200 | 1200 | 1200 | 1000 | 400 | 200 | 100 |

10.8 PROFIBUS DP Connector Description

Table 9.4 – PROFIBUS DP connector

| DB9 Pin Description | DB9 Pin# | DB9 Termination with PLX51-PBM |
|---------------------|----------|--|
| Chassis ground | 1 | |
| Reserved | 2 | |
| Data+ / B | 3 | In case of termination connect this pin to Pin 8 (Data - / A) with 220 ohm resistor |
| Tx enable | 4 | |
| Isolated ground | 5 | Connect this pin to Pin 8 (Data - / A) with 390 ohm resistor |
| Voltage plus | 6 | Connect this pin to Pin 3 (Data + / B) with 390 ohm resistor |
| Reserved | 7 | |
| Data- / A | 8 | |
| Reserved | 9 | |

11 Appendix

11.1 DPV1 Response Status (Master Only)

| Table 44.4 | | |
|--------------|-------------|----------------|
| Table 11.1 - | DP Status I | Response codes |

| DP Status | Description |
|-----------|---|
| 00h | Successful |
| 05h | FDL error (see extended error code) |
| 06h | DPV1 Error (see extended error code) |
| 07h | Another command is already in progress for this slave / class 2 connection. |
| 11h | Online state expected |
| 13h | Invalid slave response |
| 17h | Timeout passed |

11.2 DPV1 Extended Status Codes (Master Only) – FDL Error

| DP Status – Byte 0 | Description |
|--------------------|--|
| 0h | ОК |
| 1h | User error, SAP locked |
| 2h | No resource for sending data, tried to send to SAP that was not configured |
| 3h | No service available (SAP does not exist) |
| 4h | Access point blocked |

Table 11.2 – DP Extended Status Response codes (FDL Error)

NOTE: With an FDL Error, Extended Status bytes 2 and 3 will be zero.

11.3 DPV1 Extended Status Codes (Master Only) – DPV1 Error

11.3.1 DPV1 Read/Write Error

Table 11.3 – DP Extended Status Response codes (DPV1 Error) – Byte 1

| Value | Description | |
|------------|--------------|--|
| 0 to 127 | Reserved | |
| 128 | DPV1 | |
| 129 to 253 | Reserved | |
| 254 | PROFIBUS FMS | |
| 255 | N/A | |

| Bit 4 to 7 Value | Bit 0 to 3 Value | Description |
|---------------------|------------------|--------------------------|
| 0 to 9 | - | Reserved |
| 10 | - | Application |
| - | 0 | Read Error |
| | 1 | Write Error |
| | 2 | Module Failure |
| | 3 - 7 | Reserved |
| | 8 | Version Conflict |
| | 9 | Feature not supported |
| | 10 - 15 | User Specific |
| 11 | - | Access |
| | 0 | Invalid Index |
| | 1 | Write length error |
| | 2 | Invalid Slot |
| | 3 | Type conflict |
| | 4 | Invalid area |
| | 5 | State conflict |
| | 6 | Access Denied |
| | 7 | Invalid range |
| | 8 | Invalid parameter |
| | 9 | Invalid type |
| | 10 - 15 | User specific |
| 12 | - | Resource |
| | 0 | Read constrain conflict |
| | 1 | Write constrain conflict |
| | 2 | Resource busy |
| | 3 | Resource unavailble |
| | 4 – 7 | Reserved |
| | 8 - 15 | User specific |
| 13 to 15 | - | User specific |

DPV1 Extended Status - Byte 2

Table 11.4 – DP Extended Status Response codes (DPV1 Error) – Byte 2

NOTE: With a DPV1 Read/Write Error, Extended Status Byte 3 will be manufacturer specific.

11.3.2 DPV1 Abort

DPV1 Extended Status - Byte 1 - Subnet

Table 11.5 – DP Extended Status Response codes (DPV1 Error) – Byte 1 – Subnet

| Value | Description |
|----------|---------------|
| 0 | No Subnet |
| 1 | Local Subnet |
| 2 | Remote Subnet |
| 3 to 255 | Reserved |

DPV1 Extended Status - Byte 2 – Instance/Reason

Table 11.6 – DP Extended Status Response codes (DPV1 Error) – Byte 2 – Instance/Reason

| Value | Description |
|------------|--|
| Bit 6 to 7 | Reserved |
| Bit 4 to 5 | 00 – FDL 01 – MSAC_C2 10 – User 11 – Reserved |
| Bit 0 to 3 | See EN 50170 Part 2 |

12 Support, Service & Warranty

12.1 Contacting Technical Support

ProSoft Technology, Inc. is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

- Product Version Number
- System architecture
- Network details

If the issue is hardware related, we will also need information regarding:

- Module configuration and associated ladder files, if any
- Module operation and any unusual behavior
- Configuration/Debug status information
- LED patterns
- Details about the interfaced serial, Ethernet or Fieldbus devices

Note: For technical support calls within the United States, ProSoft Technology's 24/7 after-hours phone support is available for urgent plant-down issues.

| North America (Corporate Location) | Europe / Middle East / Africa Regional Office |
|------------------------------------|---|
| Phone: +1.661.716.5100 | Phone: +33.(0)5.34.36.87.20 |
| info@prosoft-technology.com | france@prosoft-technology.com |
| Languages spoken: English, Spanish | Languages spoken: French, English |
| REGIONAL TECH SUPPORT | REGIONAL TECH SUPPORT |
| support@prosoft-technology.com | support.emea@prosoft-technology.com |
| Latin America Regional Office | Asia Pacific Regional Office |
| Phone: +52.222.264.1814 | Phone: +60.3.2247.1898 |
| latinam@prosoft-technology.com | asiapc@prosoft-technology.com |
| Languages spoken: Spanish, English | Languages spoken: Bahasa, Chinese, English, |
| REGIONAL TECH SUPPORT | Japanese, Korean |
| support.la@prosoft-technology.com | REGIONAL TECH SUPPORT |
| ··· · · · · | support.ap@prosoft-technology.com |

For additional ProSoft Technology contacts in your area, please visit:

www.prosoft-technology.com/About-Us/Contact-Us.

12.2 Warranty Information

For complete details regarding ProSoft Technology's TERMS & CONDITIONS OF SALE, WARRANTY, SUPPORT, SERVICE AND RETURN MATERIAL AUTHORIZATION INSTRUCTIONS, please see the documents at: www.prosoft-technology/legal