

Where Automation Connects.



**ProLinX**<sup>®</sup>

**PDPS**

**ProLinX Gateway**

**PROFIBUS DP Slave**

December 31, 2008

## Important Installation Instructions

Power, Input and Output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods, Article 501-4 (b) of the National Electrical Code, NFPA 70 for installation in the U.S., or as specified in Section 18-1J2 of the Canadian Electrical Code for installations in Canada, and in accordance with the authority having jurisdiction. The following warnings must be heeded:

- A** WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIV. 2;
- B** WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES, and
- C** WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
- D** "THIS DEVICE SHALL BE POWERED BY CLASS 2 OUTPUTS ONLY.

### All ProLinx® Products

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT – RISQUE D'EXPLOSION – AVANT DE DÉCONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

### Markings



CL I Div 2 GP A, B, C, D

Temp Code T5

II 3 G

Ex nA nL IIC T4 X

0° C <= Ta <= 60° C

II – Equipment intended for above ground use (not for use in mines).

3 – Category 3 equipment, investigated for normal operation only.

G – Equipment protected against explosive gasses.

### ProLinx Modules with Ethernet Ports

Series C ProLinx™ modules with Ethernet ports do **NOT** include the HTML Web Server. The HTML Web Server must be ordered as an option. This option requires a factory-installed hardware addition. The HTML Web Server now supports:

- 8 MB file storage for HTML files and associated graphics files (previously limited to 384K)
- 32K maximum HTML page size (previously limited to 16K)

### To upgrade a previously purchased Series C model:

Contact your ProSoft Technology distributor to order the upgrade and obtain a Returned Merchandise Authorization (RMA) to return the unit to ProSoft Technology.

### To Order a Series C mode with the -WEB option:

Add **-WEB** to the standard ProLinx part number. For example, **5201-MNET-MCM-WEB**.

## **Your Feedback Please**

We always want you to feel that you made the right decision to use our products. If you have suggestions, comments, compliments or complaints about the product, documentation or support, please write or call us.

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PDPS Driver Manual  
December 31, 2008

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## **ProSoft® Product Documentation**

In an effort to conserve paper, ProSoft Technology no longer includes printed manuals with our product shipments. User Manuals, Datasheets, Sample Ladder Files, and Configuration Files are provided on the enclosed CD and are available at no charge from our web site: <http://www.prosoft-technology.com>

Printed documentation is available for purchase. Contact ProSoft Technology for pricing and availability.

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# 1 Start Here

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## 1.1 System Requirements

The for the PDPS module requires the following minimum hardware and software components:

- Pentium® II 450 MHz minimum. Pentium III 733 MHz (or better) recommended
- Supported operating systems:
  - Microsoft Windows XP Professional with Service Pack 1 or 2
  - Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
  - Microsoft Windows Server 2003
- 128 Megabytes of RAM minimum, 256 Megabytes of RAM recommended
- 100 Megabytes of free hard disk space (or more based on application requirements)
- 256-color VGA graphics adapter, 800 x 600 minimum resolution (True Color 1024 × 768 recommended)
- CD-ROM drive

## 1.2 Package Contents

The following components are included with your PDPS module, and are all required for installation and configuration.

Important: Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	PDPS Module	PLX-####	ProLinx communication gateway module
1	Cable	Cable #15, RS232 Null Modem	For RS232 Connection to the CFG Port
Varies	Cable	Cable #9, Mini-DIN8 to DB9 Male Adapter	For DB9 Connection to Module's Port. One DIN to DB-9M cable included per configurable serial port
Varies	Adapter	1454-9F	Adapters, DB9 Female to Screw Terminal. For RS422 or RS485 Connections to each serial application port of the Module
1	ProSoft Solutions CD		Contains sample programs, utilities and documentation for the PDPS module.

If any of these components are missing, please contact ProSoft Technology Support for replacement parts.



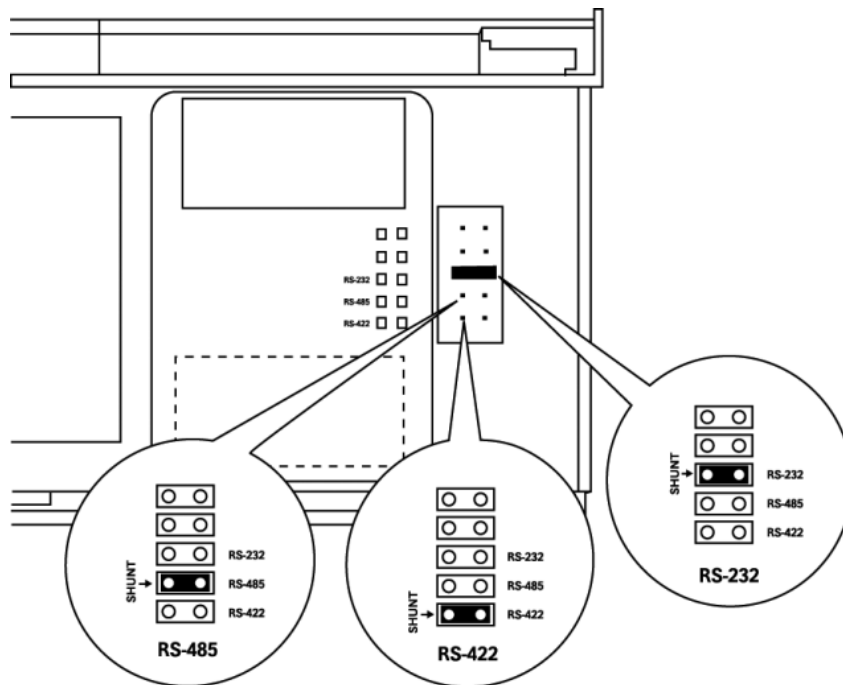
### 1.3 Setting Port 0 Configuration Jumpers

Before installing the module on the DIN rail, you must set the jumpers for the Port 0 application port.

**Note:** Ethernet-only ProLinx modules do not use the serial port jumper settings. The serial configuration jumper settings on an Ethernet-only module have no effect.  
**Note:** The presence of Port 0 depends on the specific combination of protocols in your ProLinx module. If your module does not have a Port 0, the following jumper settings do not apply.

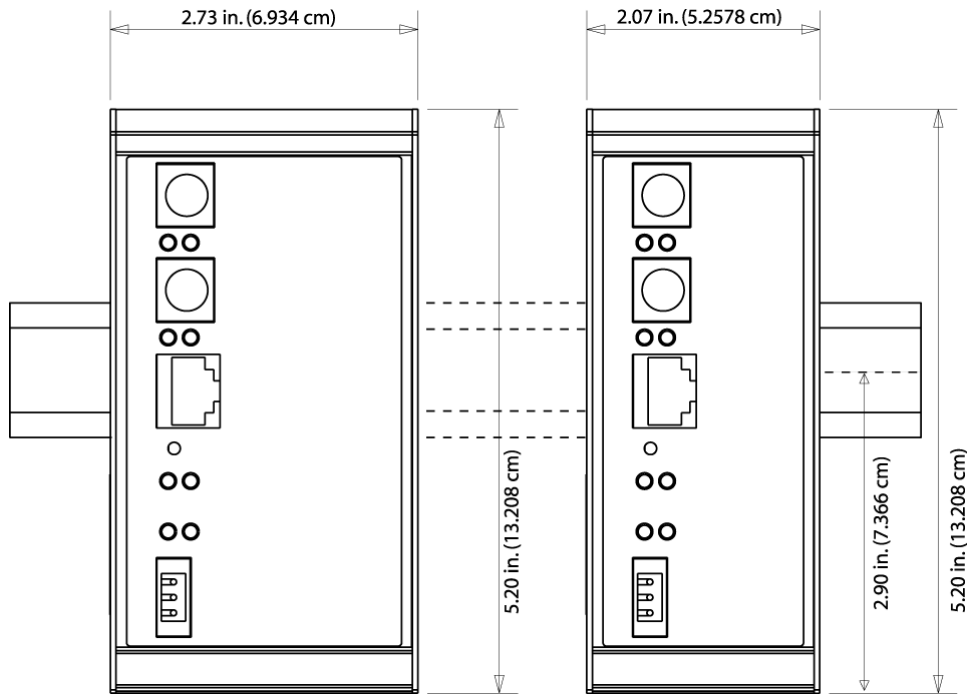
Port 0 is preconfigured for RS-232. You can move the port configuration jumper on the back of the module to select RS-485 or RS-422.

The following illustration shows the jumper positions for Port 0:



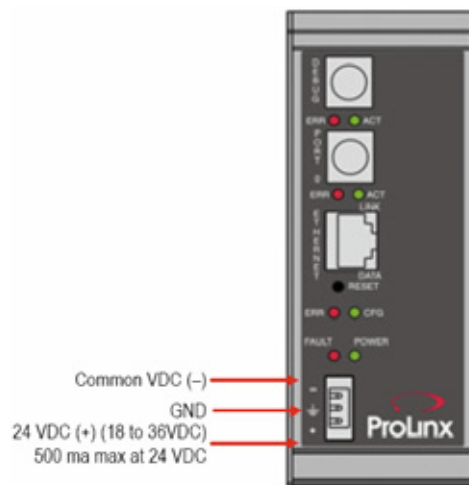
ProLinx 5000/6000 Series Module

### 1.4 Mounting the Module on the DIN Rail



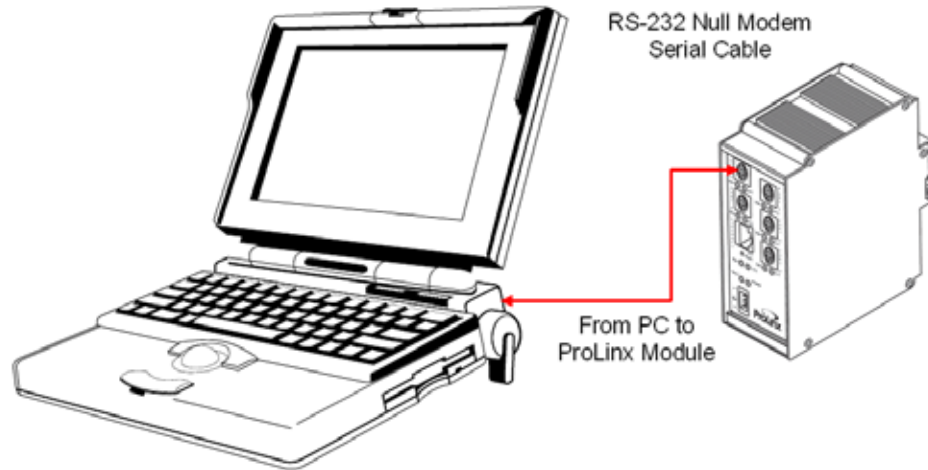
ProLinx 5000/6000 Series Module

### 1.5 Connecting Power to the Unit

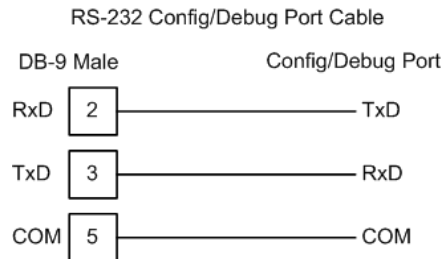


**WARNING:** Ensure that you do not reverse polarity when applying power to the module. This will cause damage to the module's power supply.

## 1.6 RS-232 Configuration Port Serial Connection



This port is physically a Mini-DIN connection. A Mini-DIN to DB-9 adapter cable is included with the module. This port permits ProSoft Configuration Builder to view configuration and status data in the module and to control the module. The following illustration shows the pinout for communications on this port.



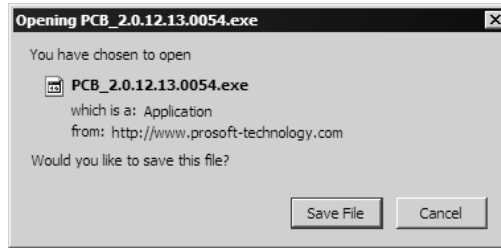
## 1.7 Install ProSoft Configuration Builder Software

You must install the ProSoft Configuration Builder (PCB) software in order to configure the PDPS module. You can always get the newest version of ProSoft Configuration Builder from the ProSoft Technology web site.

### To install ProSoft Configuration Builder from the ProSoft Web Site

- 1 Open your web browser and navigate to <http://www.prosoft-technology.com/pcb>
- 2 Click the **Download Here** link to download the latest version of ProSoft Configuration Builder.

- 3 Choose "Save" or "Save File" when prompted. The following illustrations show the file download prompt for two of the most common web browsers.



- 4 Make a note of the location where you saved the file, for example "Desktop", or "My Documents", so you can start the installation program.
- 5 When the download is complete, locate and open the file, and then follow the instructions on your screen to install the program.

If you do not have access to the Internet, you can install ProSoft Configuration Builder from the ProSoft Solutions CD-ROM, included in the package with your PDPS module.

To install ProSoft Configuration Builder from the Product CD

- 1 Insert the ProSoft Solutions Product CD into the CD drive of your PC. Wait for the startup screen to appear.
- 2 On the startup screen, click *Product Documentation*. This action opens an explorer window.
- 3 Click to open the *Utilities* folder. This folder contains all of the applications and files you will need to set up and configure your module.
- 4 Double-click the *ProSoft Configuration Builder Setup* program and follow the instructions on your screen to install the software on your PC.

Note: Many of the configuration and maintenance procedures use files and other utilities on the CD-ROM. You may wish to copy the files from the Utilities folder on the CD-ROM to a convenient location on your hard drive.

### ***1.7.1 Using the help system***

Most of the information needed to help you use is provided in a help system that is always available whenever you are running . The help system does not require an Internet connection.

To view the help pages, start , open the Help menu, and then choose Contents.



## 2 Functional Overview

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❖ Port Physical and Protocol Specifications .....	16
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❖ Mailbox Commands.....	18
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The PROFIBUS slave protocol driver may exist in a single port implementation. The driver can be configured as a slave interface with other PROFIBUS devices. The PROFIBUS slave port can be used to continuously interface with other PROFIBUS devices over a serial communication interface (RS-485).

### 2.1 About the PROFIBUS Protocol

PROFIBUS (Process Field Bus) is a widely-used, open-standards protocol created by a consortium of European factory automation suppliers in 1989.

PROFIBUS is a master/slave protocol. The master establishes a connection to the remote slave. When the connection is established, the master sends the PROFIBUS commands to the slave. The PDPS module works as a slave only.

The module uses an internal database to pass data and commands between the processor and the client and server devices on the PROFIBUS network.

PROFIBUS supports a variety of network types. The network type supported by the PDPS module is PROFIBUS DP (Device Bus), which is designed for remote I/O systems, motor control centers, and variable speed drives.

## 2.2 Port Physical and Protocol Specifications

### 2.2.1 PROFIBUS Slave Port Specifications

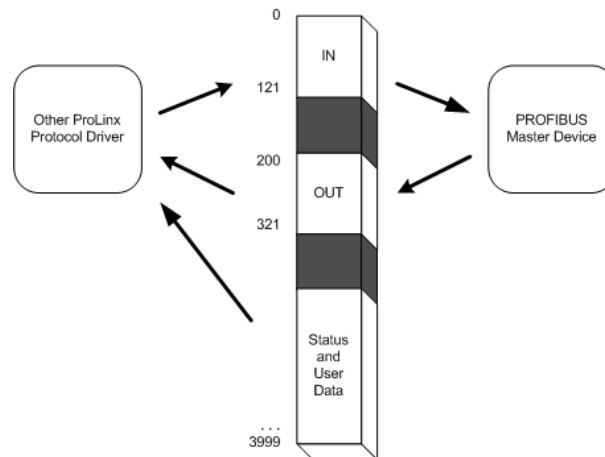
Type	Specifications
General Parameters	
Internal Database	Up to 4000 registers (words) available.
GSD File	Downloadable from ProSoft-Technology.com web site
<b>PROFIBUS Slave</b>	
Communication parameters	Baud Rate: 9.6 kbps to 12 Mbps
Supported I/O length	122 words Input data 122 words Output data 200 words max
Supported PROFIBUS DP features	Freeze Mode Sync Mode Auto Baud Setting
Configurable Parameters	a) PROFIBUS Node Address: 0 to 125 b) Data byte swapping c) Action on loss of PROFIBUS connection d) Comm Fail Timeout Multiplier e) Status Data location in Internal Database
Status Data	Error codes available on an individual command basis. In addition, a slave status list is maintained per active PROFIBUS Slave port.
<b>Physical Connection</b>	
PROFIBUS Connector	Standard PROFIBUS DB-9F communication connector. Cable connection matches PROFIBUS pin out specification.

**Important Note:** The slave node address is set to 126 by default in the module configuration file (page 21). The default node address must be changed to a valid address between 0 to 125 by the user for the slave to function on the PROFIBUS network.



## 2.3 Module Internal Database

Central to the functionality of the module is the internal database. This database is shared between all the ports on the module and is used as a conduit to pass information from one device on one network to one or more devices on another network. This permits data from devices on one communication port/network to be viewed and controlled by devices on another port/network. In addition to data from the slave port, status and error information generated by the module can also be mapped into the internal database.



### 2.3.1 PROFIBUS Slave Port Access to Database

The Slave driver uses the database in two ways:

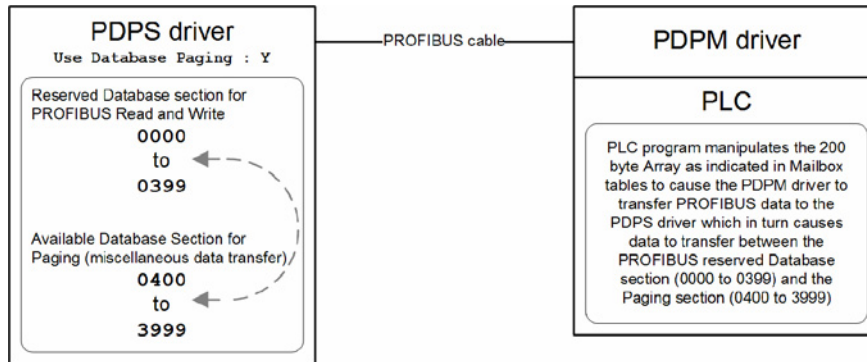
- 1 A read command issued to a slave device by the slave driver will return the slave data into the internal database.
- 2 A write command issued to a slave device by the slave driver uses the data in the internal database to write to the slave device

Besides the standard PROFIBUS interface reserved Database range from word 0 to word 399, the PDPS driver recognizes a special command code in the PROFIBUS protocol that causes the PDPS driver to write to, or read from the Database range word 400 to word 3999. This feature opens up to the user the whole capacity of the PDPS module's Database.

To use the Database Paging functionality in the PDPS driver the following three items must be implemented.

- 1 Enable the paging feature in the PDPS module's configuration file under the **[Profibus Slave]** section, set **Use Database Paging : Y**.
- 2 In PROFIBUS Master module's configuration the PROFIBUS Slave must be set to 100 Input Words and 100 Output Words.

- In the PLC Program create an array of 200 bytes. The contents of the array are described in the Mailbox Command and Mailbox Structure tables.



## 2.4 Mailbox Commands

Start Value	Stop Value	Direction	Description
150	151	PLC to PDPM to PDPS	Database Write transfer, from the PLC's perspective.  The value of 150 in the specific Array index location as indicated in the Mailbox structure table will cause the PROFIBUS Slave driver to transfer the data in the 200 Byte array to the Database locations above word 400. The Value of 151 stops the data transfer.
160	161	PDPS to PDPM to PLC	Database Read transfer, from the PLC's perspective.  The value of 160 in the specific Array index location as indicated in the Mailbox structure table will cause the PROFIBUS Slave driver to transfer the data to the 200 Byte array from the Database locations above word 400. The Value of 161 stops the data transfer.

PLC = PROFIBUS master interface in PLC.  
 PDPM = PROFIBUS Master.  
 PDPS = PROFIBUS Slave.

### NOTES:

The block number for each device must be changed to trigger an operation.  
 The I/O data area is owned exclusively by only the PLC or PDPM.  
 A timeout must be implemented in the PLC in case the PDPM is not present.

## 2.5 Mailbox Structure

This 200 Byte Array is located in the PLC containing the PDPM gateway module, not in the PDPS.

Example Raw Database Exchange. Output from PLC to PDPM

Word	Start Byte	End Byte	Description
0	0	0	150 (Raw data write). <i>This value tells PDPS driver to write into Database paging section.</i>
	1	1	160 (Raw data read). <i>This value tells PDPS driver to read from Database Paging section.</i>
1	2	3	Start register in database for write. <i>This value tells the PDPS driver where in the Database Paging section to start writing to.</i>
2	4	5	Number of registers to write (1 to 94). <i>This value tells the PDPS Driver the quantity of registers to be filled with data.</i>
3	6	7	Start register in database for read. <i>This value tells the PDPS driver where in the Database Paging section to start reading from.</i>
4	8	9	Number of registers to read (1 to 96). <i>This value tells the PDPS Driver the quantity of registers to read from.</i>
5 to 98	10	197	Words to write to the database. <i>The actual data to be transferred to the Database paging section. In the PLC, fill these bytes of the Array with values to be transferred to the PDPS's Database paging section.</i>
99	198	198	Reserved. <i>Do not use.</i>
	199	199	150 (Raw data write). <i>This value tells PDPS driver to write into Database paging section. Duplicated from Array[0] index.</i>

Example Response Block From PDPM. Input to PLC from PDPM.  
Communications acknowledgement.

Word	Start Byte	End Byte	Description
0	0	0	160 (Raw data read). <i>PDPS Driver responded to the PDPM driver which in turn responded to the PLC that the data in this 200 word Array is from the PDPS drive's Database paging section.</i>
	1	1	150 (Raw data write). <i>PDPS driver is responding to the PDPM driver which in turn responds to the PLC that the data has been written.</i>
1	2	3	Start register in database for read. <i>PDPS driver is responding to the PDPM driver which in turn responds to the PLC where in the PDPS Database paging was the beginning of the data read.</i>
2	4	5	Number of registers to read (1 to 96). <i>This value tells the PLC the quantity of registers that the PDPS Driver read.</i>
3 to 98	6	197	Words read from the database. <i>The actual words that were read from the PDPS Database Paging section.</i>
99	198	199	Reserved. <i>Do not use.</i>
	199	199	160 (Raw data read). <i>Signifies the end of the read block</i>

### 2.5.1 Mailbox From PLC to Gateway

Start Byte	End Byte	Description
0	0	Block number of data in block
1	1	Block number of data requested
2	198	Data for block
199	199	Block number of data in block

### 2.5.2 Mailbox From Gateway to PLC

Start Byte	End Byte	Description
0	0	Block number of data in block
1	1	Block number last requested by PLC
2	198	Data for block
199	199	Block number of data in block

### 2.5.3 Example Raw Database Exchange

Start Byte	End Byte	Description
0	0	150 (Raw data write)
1	1	160 (Raw data read)
2	3	Start register in database for write
4	5	Number of registers to write (1 to 94)
6	7	Start register in database for read
8	9	Number of registers to read (1 to 96)
10	197	Words to write to the database
198	198	Reserved
199	199	150 (Raw data write)

### 2.5.4 Example Response Block From GW

Start Byte	End Byte	Description
0	0	160 (Raw data read)
1	1	150 (Raw data write)
2	3	Start register in database for read
4	5	Number of registers to read (1 to 96)
6	197	Words read from the database
198	198	Reserved
199	199	160 (Raw data read)

### 3 Configuration

*In This Chapter*

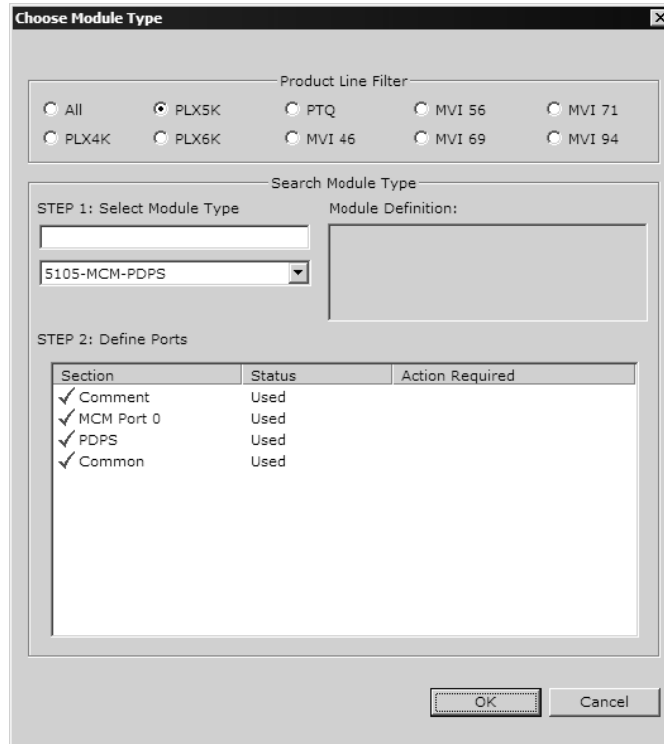
- ❖ Configure the Module .....21
- ❖ PDPS Protocol Configuration .....25
- ❖ [PROFIBUS SLAVE] .....26
- ❖ Set\_Param (SAP61).....27
- ❖ Downloading a File from PC to the Module .....29

#### 3.1 Configure the Module

##### 3.1.1 Adding a Module

- 1 Double-click the Default Module icon in the left pane to open the Choose Module Type dialog box.

Note: ProLinx modules always combine two or more protocols. The following illustration shows an example ProLinx module with PDPS and one other protocol. Please choose the module type in ProSoft Configuration Builder that matches the combination of protocols in your ProLinx module.

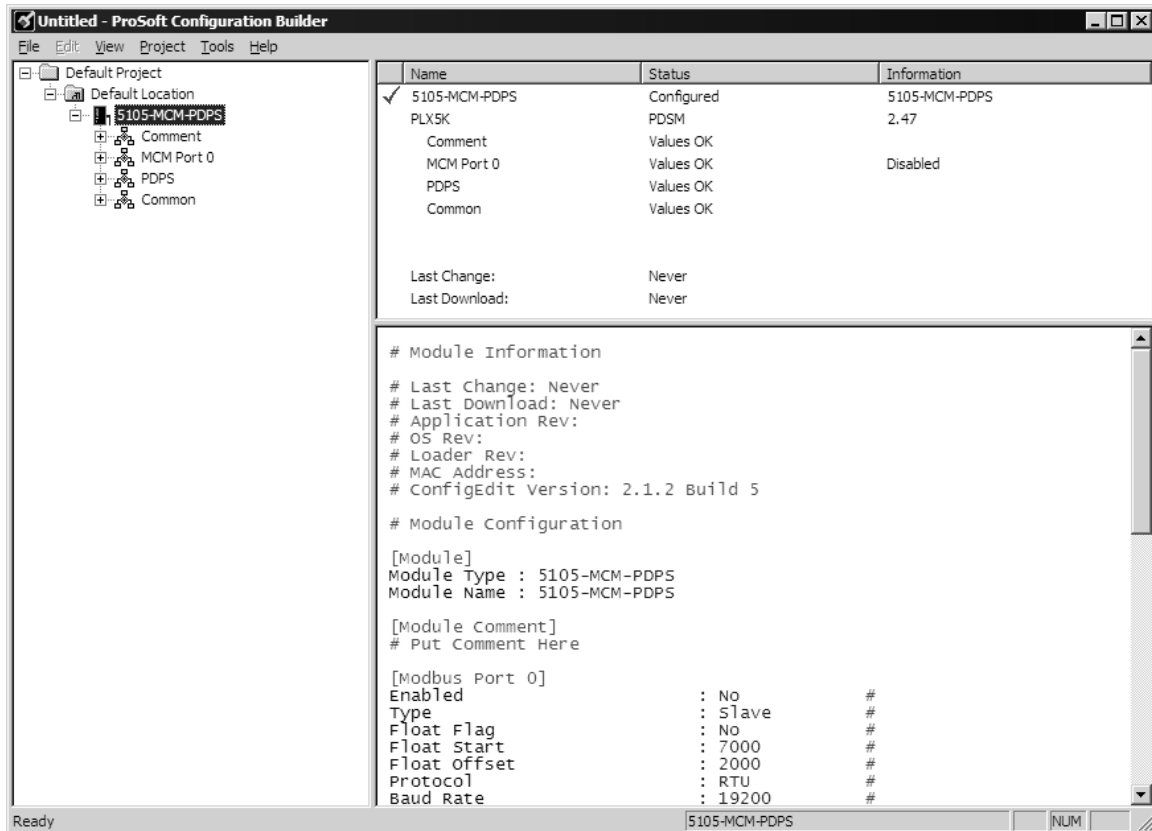


On the Choose Module Type dialog box, select the module type.

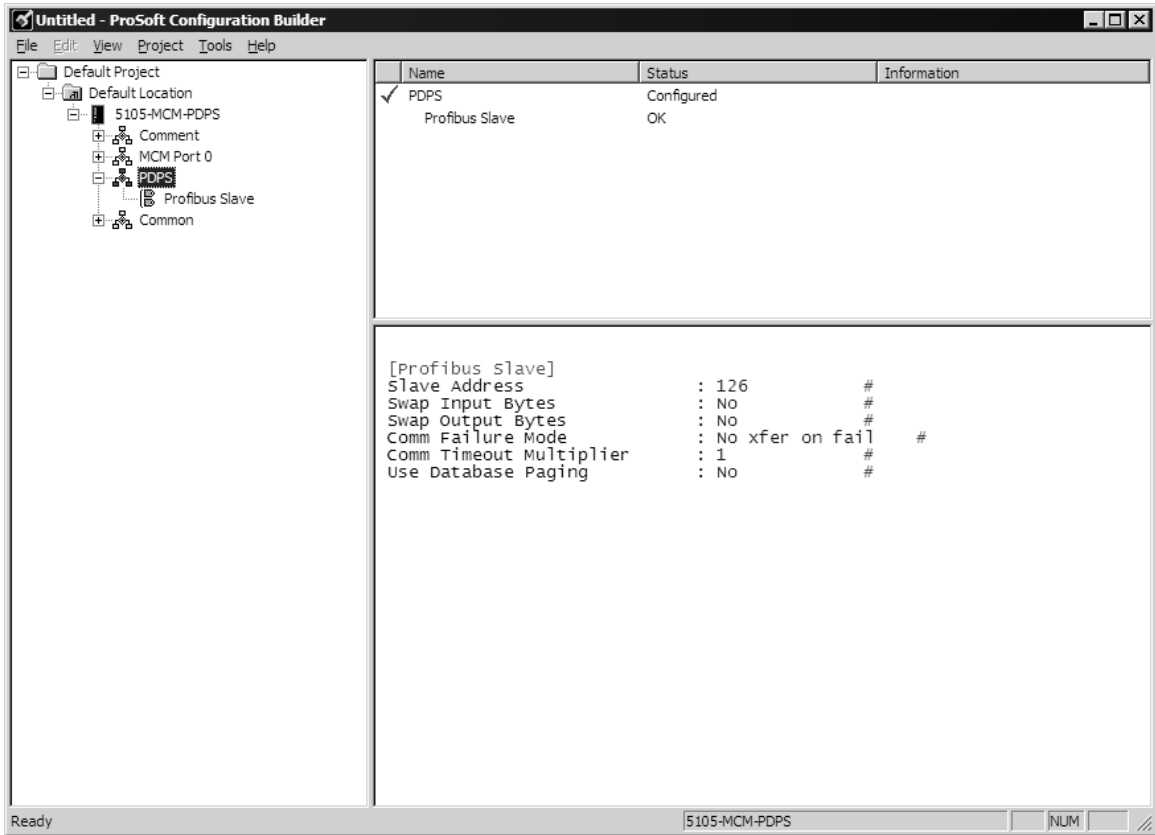
### 3.1.2 Module Entries

#### To configure module parameters

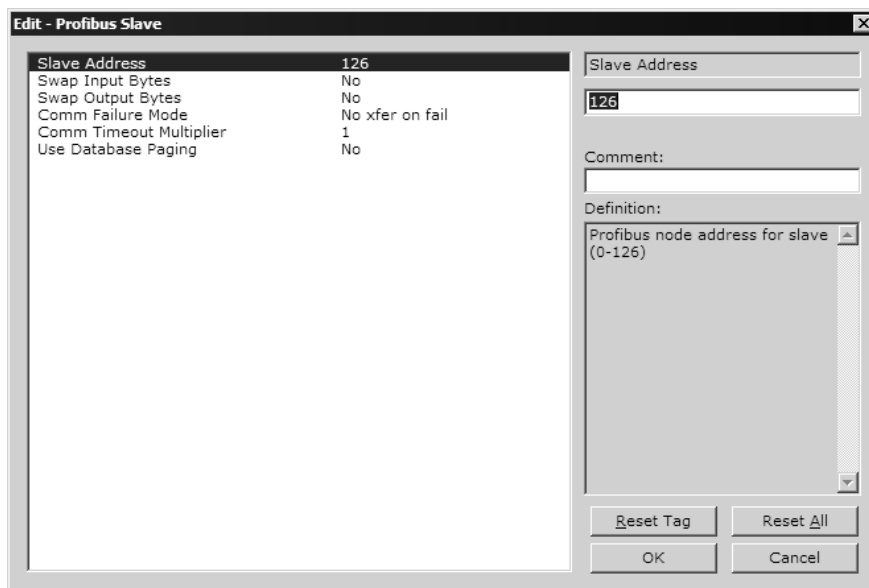
- 1 Click on the plus sign next to the module icon to expand module information.



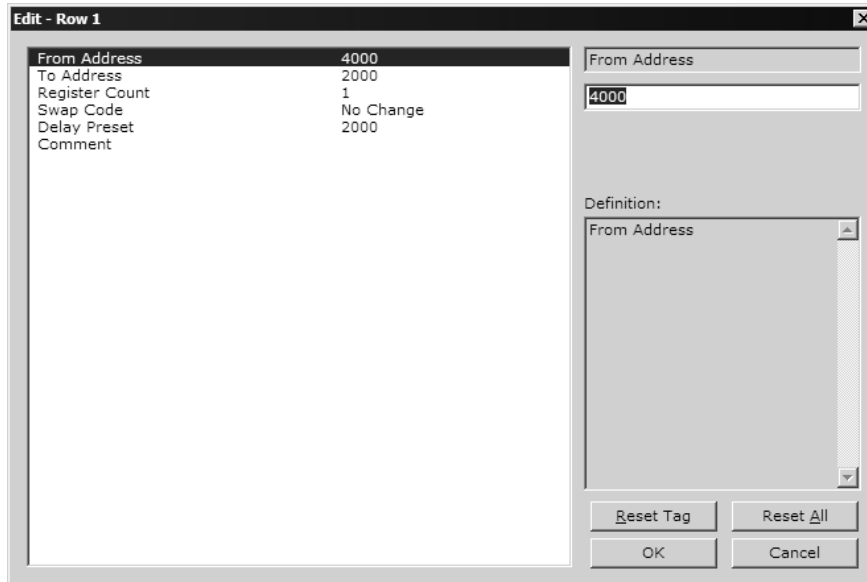
- Expand each icon in the list to view the configuration tags. Double-click a tag to edit the configuration parameters.



- For parameter entries, select the parameter in the left pane and make your changes in the right pane.





For data map entries, click the Add Row button to add an item to the list. Click Edit Row to edit the parameters.

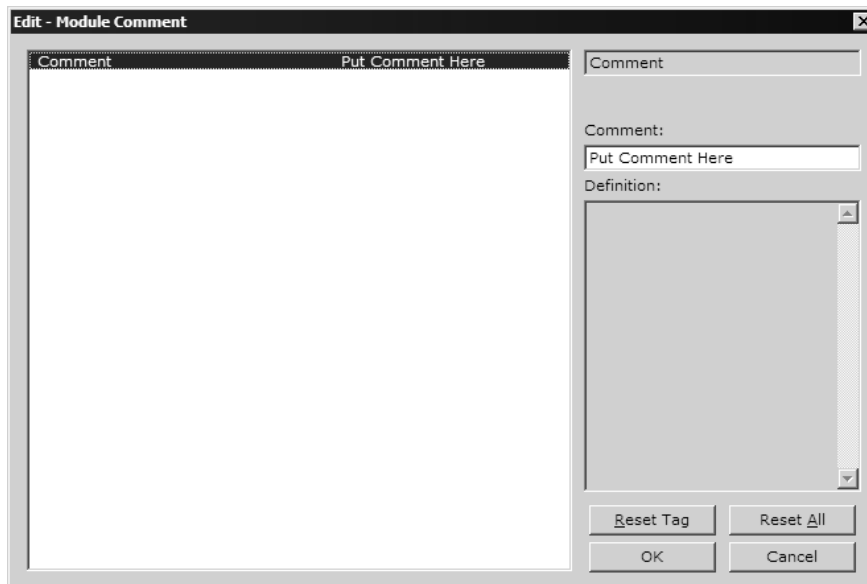


Click OK to save your changes.

### 3.1.3 Comment Entries

To add comments to your configuration file:

- 1 Click the plus sign to the left of the  Comment icon to expand the Module Comments.
- 2 Double-click the  Module Comment icon. The Edit - Module Comment dialog appears.



- 3 Enter your comment and click OK to save your changes.



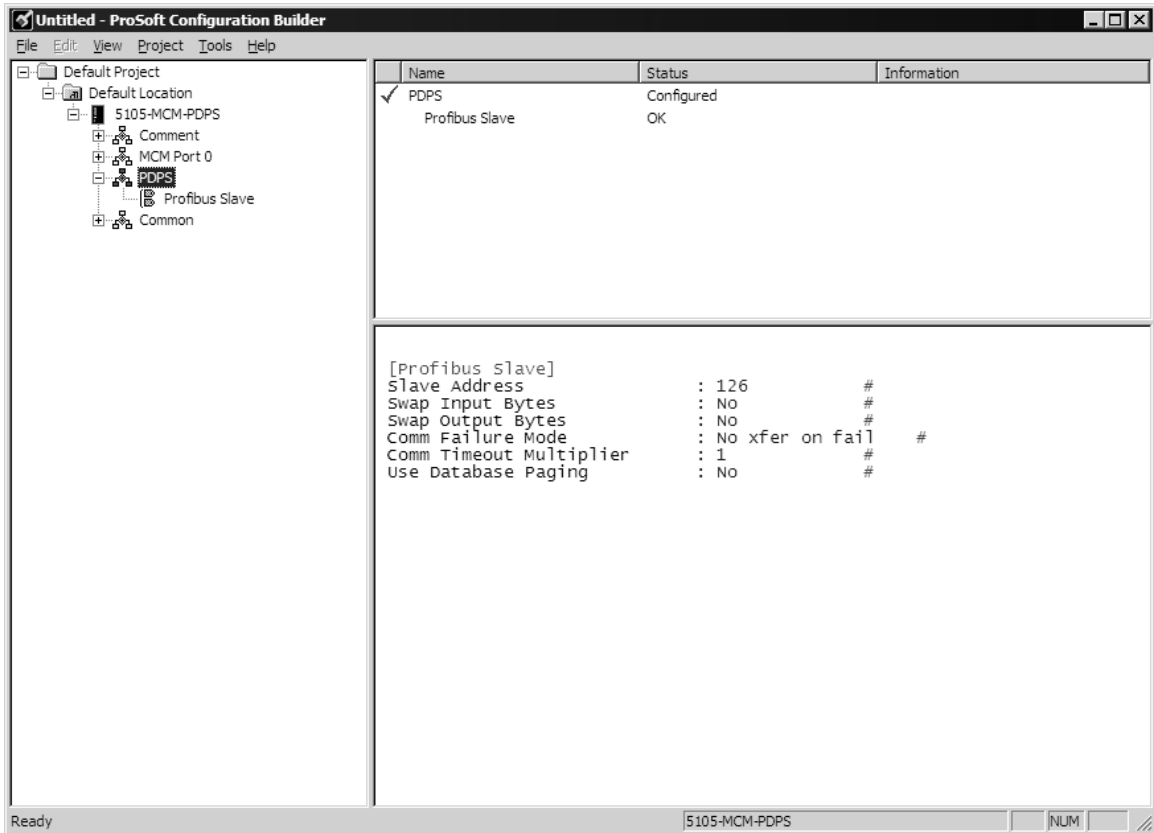
### 3.1.4 Printing a Configuration File

To print a configuration file:

- 1 Select the Module icon, and then click the right mouse button to open a shortcut menu.
- 2 On the shortcut menu, choose View Configuration. This action opens the View Configuration window.
- 3 On the View Configuration window, open the File menu, and choose Print. This action opens the Print dialog box.
- 4 On the Print dialog box, choose the printer to use from the dropdown list, select printing options, and then click OK.

## 3.2 PDPS Protocol Configuration

The following illustration from ProSoft Configuration Builder shows the PROFIBUS Slave configuration for a ProLinx PDPS module.



### 3.3 [PROFIBUS SLAVE]

The PROFIBUS Slave section contains the data that applies to the PROFIBUS Slave parameters.

#### 3.3.1 *Slave Address*

0 to 125

The parameter specifies the node address on the PROFIBUS network for the slave emulated in the module. Each node on the network must have a unique address.

Note: Although valid PROFIBUS Node addresses range from 0 to 125, Node 0 is not a valid node number for a Slave module and that Nodes 0, 1, and 2 are usually reserved for PROFIBUS Masters. Users are advised to use Node numbers 3-125

#### 3.3.2 *Swap Input Bytes*

Yes or No

This parameter specifies if the data in the input data area of the module is to be byte swapped. If the order of the bytes in the words stored in the database is not correct, use this option. A value of Yes causes the module's program to swap the bytes in each word. A value of No indicates no byte swapping will occur.

#### 3.3.3 *Swap Output Bytes*

Yes or No

This parameter specifies if the data in the output data area of the module is to be byte swapped. If the order of the bytes in the words stored in the database is not correct, use this option. A value of Yes causes the module's program to swap the bytes in each word. A value of No indicates no byte swapping will occur.

#### 3.3.4 *Comm Failure Mode*

No xfer on fail

xfer on comm fail

This parameter sets the data transfer mode of the module's PROFIBUS output image to the internal database when a communication failure on the PROFIBUS interface is detected. If the parameter is set to "No xfer on fail", the output image will continue to be transferred. If the parameter is set to "xfer on comm fail", the output image will not be transferred and the last values will be retained.

### 3.3.5 Comm Timeout Multiplier

1 to 10

This parameter sets the communication timeout value for the module. The value entered is multiplied by 125 milliseconds to determine the actual timeout value. For example, a value of 1 specifies a communication timeout of 125 milliseconds.

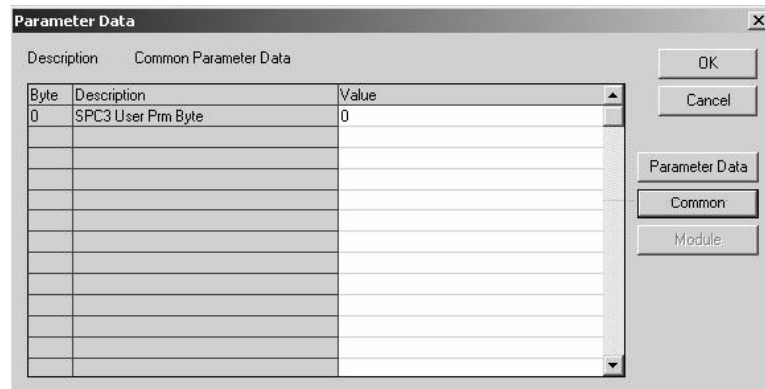
### 3.3.6 Use Database Paging

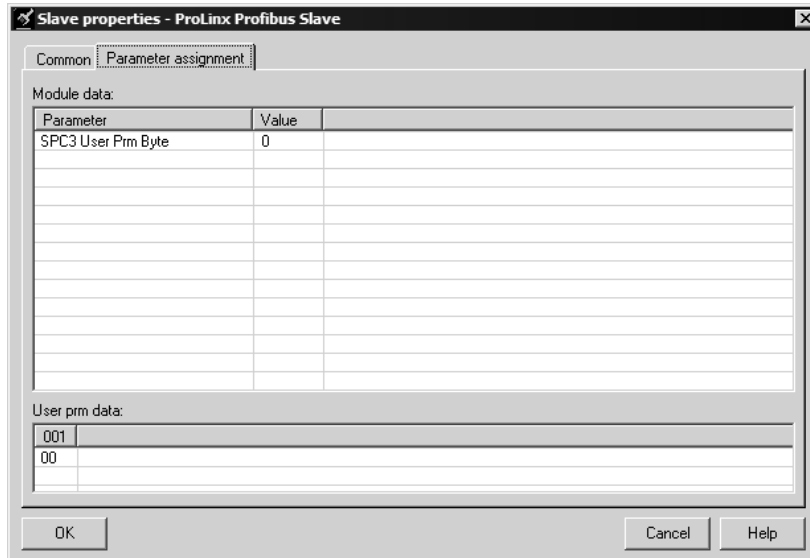
Yes or No

This Parameter Enables or disables user access to the PDPS's Database area outside the section reserved for the PROFIBUS Protocol in the range of Word 400 to Word 3999.

## 3.4 Set\_Param (SAP61)

ProSoft PROFIBUS Slave (PDPS) devices have a configurable parameter for SPC3 User Prm Byte. The following illustrations show the value of this parameter in Sycon, the configuration tool for ProLinx PROFIBUS Master devices, and in ProSoft Configuration Builder for PROFIBUS, the configuration tool for ProSoft PROFIBUS Master devices.





**Parameter Data Structure**

SPC3 evaluates the first seven data bytes (without user prm data), or the first eight data bytes (with user prm data). The first seven bytes are specified according to the standard. The eighth byte is used for SPC3-specific communications. The additional bytes are available to the application.

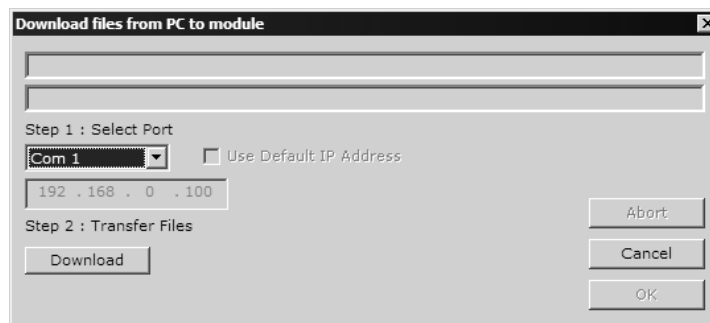
Byte	Bit Position								Designation
	7	6	5	4	3	2	1	0	
0	Lock Req	Unio Req	Sync Req	Free Req	WD on	Res	Res	Res	Station status
1									WD_Fact_1
2									WD_Fact_2
3									MinTSDR
4									Ident_Number_High
5									Ident_Number_Low
6									Group_Ident
7									Spec_User_Prm_Byte
8 to 243									User_Prm_Data

Byte 7 Spec_User_Prm_Byte			
Bit	Name	Significance	Default State
0	Dis_Startbit	The start bit monitoring in the receiver is switched off with this bit	Dis_Startbit = 1, That is, start bit monitoring is switched off.
1	Dis_Stopbit	Stop bit monitoring in the receiver is switched off with this bit	Dis_Stopbit = 0 That is, stop bit monitoring is not switched off.
2	WD_Base	This bit specifies the time base used to clock the watchdog. WD_Base = 0: time base 10 ms WD_Base = 1: time base 1 ms	WD_Base = 0 That is, the time base is 10 ms.
3 to 4	Res	To be parameterized with 0	0
5	Publisher_Enable	DXB-publisher-functionality of the SPC3 is activated with this bit	Publisher_Enable = 0, DXB-request-telegrams are ignored; Publisher_Enable = 1, DXB-request-telegramme are processed
6 to 7	Res	To be parameterized with 0	0

### 3.5 Downloading a File from PC to the Module

To download a file from the Configuration Builder to the module:

- 1 Verify that your PC is connected to the module with a null-modem serial cable connected to the serial port on your PC and the serial port on the module
- 2 Open the Project Menu, and then choose Module.
- 3 On the Module menu, choose Download. Wait while ProSoft Configuration scans for communication ports on your PC. When the scan is complete, the Download dialog box opens.



- 4 Select the port to use for the download.
- 5 Click the **Download** button.



## 4 Diagnostics and Troubleshooting

### *In This Chapter*

- ❖ PROFIBUS Slave Error and Status Data..... 31
- ❖ Base Module LEDs..... 35
- ❖ PROFIBUS Slave LED Indicators..... 35
- ❖ Definition of Module's Extended Diagnostics Data ..... 35

There are two ways to troubleshoot ProLinx modules: LEDs located on the front of the module, and a Debug port that provides a view into the module's internal database.

### 4.1 PROFIBUS Slave Error and Status Data

The PROFIBUS Slave Error and Status Data area is discussed in this section.

The data area is initialized with zeros whenever the module is initialized. This occurs during a cold-start (power-on), reset (reset push-button pressed) or a warm-boot operation (commanded or loading of new configuration). Counter values are also initialized to 0 at power up.

Example Internal Database Address	Word Offset	Description
10300	0	Diagnostic reporting state 0=normal 1=extended 2=static diagnostics 3=extended/static diagnostics
10301	1	Reserved
10303	3	Reserved
10304	4	Product Codes Bytes 0 and 1
10305	5	Product Codes Bytes 2 and 3
10306	6	Product Codes Bytes 4 and 5
10307	7	Product Codes Bytes 6 and 7
10308	8	Product Codes Bytes 8 and 9
10309	9	PROFIBUS Status Register
10310	10	Module state and last global command received by slave from a master
10311	11	Input counter (number of times the input region of the database is transferred to the input image)
10312	12	Output counter (number of times the output image is transferred to the database)
10313 to 10399	13	No valid data

Refer to the following topics to interpret the status/error codes present in the data area.

### 4.1.1 Diagnostic state - Word 10300

- 0 = Normal Operation or not in data exchange with Status Register [0] Bit 0x20 set.
- 1 = Not in data exchange state with the Status Register [0] bit 0x20 not set or normal operation with the Status Register [0] bit 0x20 not set.
- 3 = Not in a defined state or in module state 1, 2 or 3.
- 4 = Normal operation with Status Register [0] bit 0x20 set

### 4.1.2 PROFIBUS Reserved Words: Word 10301 to Word 10303

Reserved for future use.

### 4.1.3 Words 10304 to 10308

Example Internal Database Address	Word Offset	Description
10304	4	Product Codes Bytes 0 and 1
10305	5	Product Codes Bytes 2 and 3
10306	6	Product Codes Bytes 4 and 5
10307	7	Product Codes Bytes 6 and 7
10308	8	Product Codes Bytes 8 and 9

### 4.1.4 PROFIBUS Status Register: Word 10309

SPC3 ASIC slave status information provided to the master

Bit 0	Offline/Passive-Idle Offline-/Passive-Idle state 0 = SPC3 is in offline 1 = SPC3 in passive idle
Bit 1	FDL_IND_ST (Fieldbus Data link Layer) FDL indication is temporarily buffered. 0 = No FDL indication is temporarily buffered. 1 = FDL indication is temporarily buffered.
Bit 2	Diag_Flag Status diagnostics buffer 0 = The DP master fetches the diagnostics buffer. 1 = The DP master has not yet fetched the diagnostics buffer.
Bit 3	RAM Access Violation Memory access > 1.5kByte 0 = No address violation 1 = For addresses > 1536 bytes, 1024 is subtracted from the current address, and there is access to this new address.



Bits 4,5	DP-State
	DP-State Machine state
	00 = 'Wait_Prm' state
	01 = 'Wait_Cfg' state
	10 = 'DATA_EX' state
	11 = Not possible
Bits 6,7	WD-State
	Watchdog-State-Machine state
	00 = 'Baud_Search' state
	01 = 'Baud_Control' state
	10 = 'DP_Control' state
	11 = Not possible
Bits	Baud rate:
8 to 11	The baud rates SPC3 found
	0000 = 12 MBaud
	0001 = 6 MBaud
	0010 = 3 MBaud
	0011 = 1.5 MBaud
	0100 = 500 kBaud
	0101 = 187.5 kBaud
	0110 = 93.75 kBaud
	0111 = 45.45 kBaud
	1000 = 19.2 kBaud
	1001 = 9.6 kBaud
	Rest = Not possible
Bits	SPC3-Release:
12 to 15	Release no. for SPC3
	0000 = Release 0
	Rest = Not possible

#### Further explanation of Status Register [0]: Word 10309 Bit states

##### Bit 0

##### Offline/Passive-idle

- 0 = SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer go offline.
- 1 = SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer are started.

##### Bit 4, 5

- 10 = Data Exchange State is Normal. The SPC3 has a correct configuration.

#### 4.1.5 **Module State: Word 10310 Byte 0**

Indicates the current state of the module.

- 0 = Normal Operation
- 1 = Shutdown
- 2 = File Transfer
- 3 = SPC3 ASIC problem
- 4 = Not in data exchange

#### 4.1.6 **Last Global Command: Word 10310 Byte 1**

The value of the last global command code received from the master.

Bit	Designation	Significance
0	Reserved	
1	Clear_Data	With this command the ASCII output data is deleted in data transfer buffer and is changed to next transfer data buffer contents.
2	Unfreeze	With 'Unfreeze': freezing input data is cancelled.
3	Freeze	The ASCII input data is fetched from next transfer buffer to data transfer buffer and frozen. New input data is not fetched again until the master sends the next 'Freeze' command.
4	Unsync	The 'Unsync' command cancels the 'Sync' command.
5	Sync	The ASCII output data transferred with a WRITE_READ_DATA telegram is changed from data transfer buffer next state buffer. The following transferred output data is kept in data transfer buffer until the next 'Sync' command is given.
6,7	Reserved	The Reserved designation specifies that these bits are reserved for future function expansions.

#### 4.1.7 **PROFIBUS Input Counter: 10311**

Input counter is incremented each time the input data is updated.

#### 4.1.8 **PROFIBUS Output Counter: Word 10312**

Output counter is incremented each time the output data is updated.

#### 4.1.9 **Words 10313 to 10399**

No valid data

## 4.2 Base Module LEDs

LED	State	Description
Power	Off	Power is not connected to the power terminals. This LED is hardware driven, so it only requires power to operate.
	Green Solid	Power is connected to the power terminals. Verify that the other LEDs for operational and functional status.
Fault	Off	Normal operation.
	Red Solid	A critical error has occurred. Program executable has failed or has been user-terminated and is no longer running. Press Reset p/b or cycle power to clear error. If not, use the Debug procedures described later in this manual.
Cfg	Off	Normal operation.
	Amber Solid	The unit is in the configuration mode. The configuration file is being read and the unit is implementing the configuration values and initializing the hardware. This will occur during power cycle, or after pressing the reset button. It also occurs after a cold/warm boot command is received.
Err	Off	Normal operation.
	Flashing	An error condition has been detected and is occurring. Check configuration.
	Solid Red	This condition is indicative of a large number of errors in the application interface communications. The module's error flag is cleared at the start of each command (master/client) or receipt of data (slave/adapter/server).

## 4.3 PROFIBUS Slave LED Indicators

Active LED	Error LED	Description
On	Off	Normal Operation
Off	Off	Module not receiving power or program terminated
Off	On	Module configured and waiting for first output data set.
Flashing	On	PROFIBUS communication problem (not receiving output)
Off	Flashing	User timeout expired.
On	Rapid Irregular flash	Configuration problem from master.
Flashing Together		Configuration error during initialization.
Flashing Alternately		Watchdog timer expired.

## 4.4 Definition of Module's Extended Diagnostics Data

The Extended Diagnostic Data is reported during startup and initialization sequence when the master requests diagnostic data from the module. The Extended Diagnostics is "Device Related" type providing status data (the extended diagnostic bit 3 in standard diagnostic byte 1 is set = 0). The data length is normally 14 (0E) bytes displayed in the following format:

Byte(s)	Description (HEX)
0	Extended Diagnostics length (normally 14 bytes (0E))
1 to 6	ASCII data for Product Version
7 to 10	ASCII data for Product Name
11	Value of Status Register [0] (see Section 2)

Byte(s)	Description (HEX)
12	Value of Status Register [1] (see Section 2)
13	Module State (see Section 2)

**Bytes 7 through 10 Data - Specific Product Code Value**

Each ProLinx application has its own, unique product code. You can determine the product code from the Version screen in the Configuration/Debug menu.

The following table lists the product codes for some ProLinx modules that support the PDPS protocol.

Example Product	Example Product Code
5105-ASCII-PDPS	ASPS
5105-DFCM-PDPS	DFPS
5105-DH485-PDPS	D4PS
5105-DNPM-PDPS	DMPS
5105-DNPS-PDPS	D3PS
5105-I101S-PDPS	ISPS
5105-I103M-PDPS	PSI3
5105-MCM-PDPS	PDSM

Sample Diagnostics reported to master.

```

extended diagnostic data:

0E 56 30 31 2E 30 35 50
44 53 34 41 03 04

device related diagnostic data:

0E 56 30 31 2E 30 35 50
44 53 34 41 03 04
  
```

Translated as follows:

**Extended diagnostics length** 0E= 14 bytes, **Product Version** 56 = "V", 30 = "0", 31 = "1", 2E = ".", 30 = "0", 35 = "5", **Product Name** 50 = "P", 44 = "D", 53 = "S", 34 = "4" (MVI46),

**Status Register [0]** 41 = SPC3 in passive idle and WD-State is in DP\_Control State, **Status Register [1]** 03 = 1.5 Baud rate, **Module State** 04 = not in data exchange

#### 4.4.1 The Configuration/Debug Menu

The Configuration and Debug menu for this module is arranged as a tree structure, with the Main Menu at the top of the tree, and one or more sub-menus for each menu command. The first menu you see when you connect to the module is the Main menu.

Because this is a text-based menu system, you enter commands by typing the command letter from your computer keyboard in the diagnostic window in ProSoft Configuration Builder (PCB). The module does not respond to mouse movements or clicks. The command executes as soon as you press the command letter — you do not need to press **[Enter]**. When you type a command letter, a new screen will be displayed in your terminal application.

##### Required Hardware

You can connect directly from your computer's serial port to the serial port on the module to view configuration information, perform maintenance, and send (upload) or receive (download) configuration files.

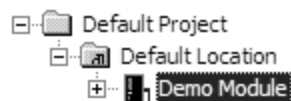
ProSoft Technology recommends the following minimum hardware to connect your computer to the module:

- 80486 based processor (Pentium preferred)
- 1 megabyte of memory
- At least one UART hardware-based serial communications port available. USB-based virtual UART systems (USB to serial port adapters) often do not function reliably, especially during binary file transfers, such as when uploading/downloading configuration files or module firmware upgrades.
- A null modem serial cable.

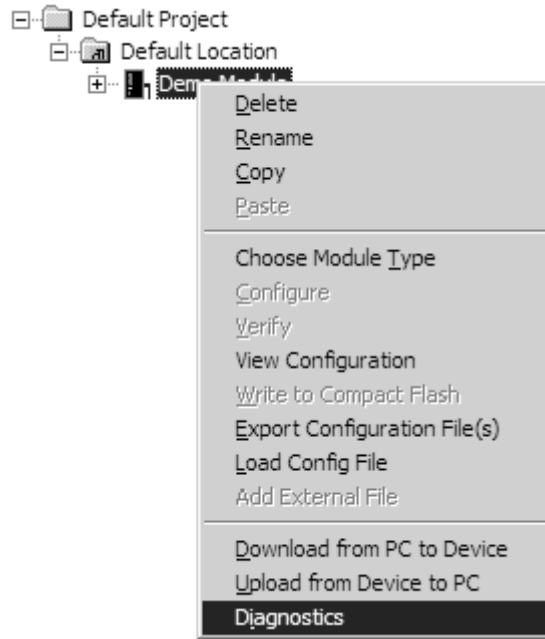
##### Using the Diagnostic Window in ProSoft Configuration Builder

To connect to the module's Configuration/Debug serial port:

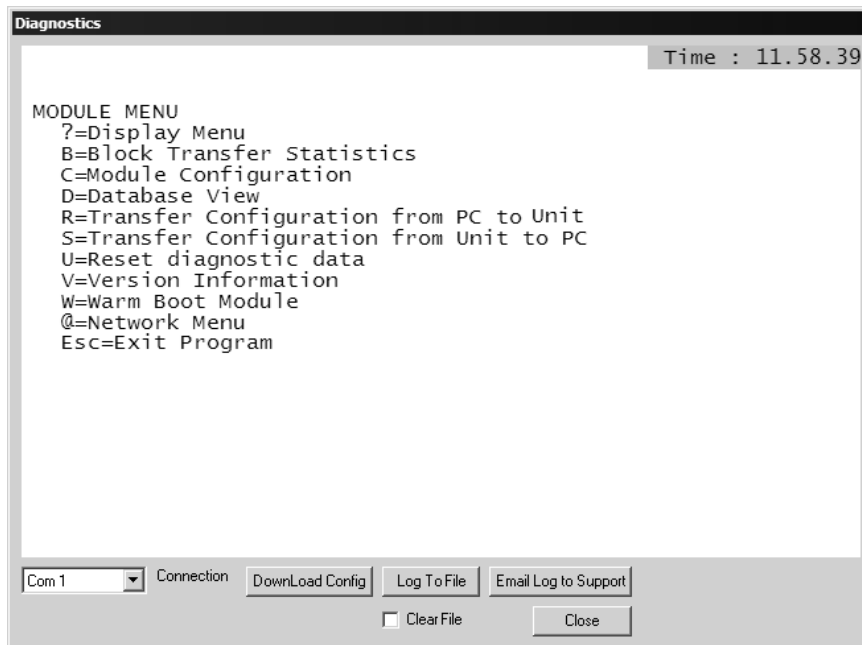
- 1 Start PCB program with the application file to be tested. Right click over the module icon.



- 2 On the shortcut menu, choose Diagnostics.



- 3 This action opens the Diagnostics dialog box. Press "?" to display the Main Menu.



**Important:** The illustrations of configuration/debug menus in this section are intended as a general guide, and may not exactly match the configuration/debug menus in your own module.

If there is no response from the module, follow these steps:

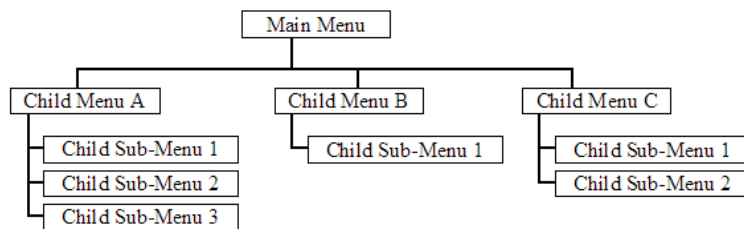
- 1 Verify that the null modem cable is connected properly between your computer's serial port and the module. A regular serial cable will not work.
- 2 On computers with more than one serial port, verify that your communication program is connected to the same port that is connected to the module.

If you are still not able to establish a connection, contact ProSoft Technology for assistance.

### Navigation

All of the sub-menus for this module contain commands to redisplay the menu or return to the previous menu. You can always return from a sub-menu to the next higher menu by pressing **[M]** on your keyboard.

The organization of the menu structure is represented in simplified form in the following illustration:



The remainder of this section shows you the menus available for this module, and briefly discusses the commands available to you.

### Keystrokes

The keyboard commands on these menus are almost always non-case sensitive. You can enter most commands in lower case or capital letters.

The menus use a few special characters (**[?]**, **[-]**, **[+]**, **[@]**) that must be entered exactly as shown. Some of these characters will require you to use the **[Shift]**, **[Ctrl]** or **[Alt]** keys to enter them correctly. For example, on US English keyboards, enter the **[?]** command as **[Shift][/]**.

Also, take care to distinguish capital letter **[I]** from lower case letter **[i]** (L) and number **[1]**; likewise for capital letter **[O]** and number **[0]**. Although these characters look nearly the same on the screen, they perform different actions on the module.

## 4.4.2 Main Menu

When you first connect to the module from your computer, your terminal screen will be blank. To activate the main menu, press the [?] key on your computer's keyboard. If the module is connected properly, the following menu will appear on your terminal screen:

```
PTQ-PDPS COMMUNICATION MODULE MENU
?=Display Menu
B=Block Transfer Statistics
C=Module Configuration
P=Profibus Slave Menu
R=Transfer Configuration from PC to Module
S=Transfer Configuration from Module to PC
U=Reset diagnostic data
V=Version Information
W=Warm Boot Module
Esc=Exit Program
```

**Caution:** Some of the commands available to you from this menu are designed for advanced debugging and system testing only, and can cause the module to stop communicating with the processor or with other devices, resulting in potential data loss or other failures. Only use these commands if you are specifically directed to do so by ProSoft Technology Technical Support staff. Some of these command keys are not listed on the menu, but are active nevertheless. Please be careful when pressing keys so that you do not accidentally execute an unwanted command.

### Redisplaying the Menu

Press [?] to display the current menu. Use this command when you are looking at a screen of data, and want to view the menu choices available to you.

### Viewing Block Transfer Statistics

Press [B] from the Main Menu to view the Block Transfer Statistics screen.

Use this command to display the configuration and statistics of the backplane data transfer operations between the module and the processor. The information on this screen can help determine if there are communication problems between the processor and the module.

**Tip:** To determine the number of blocks transferred each second, mark the numbers displayed at a specific time. Then some seconds later activate the command again. Subtract the previous numbers from the current numbers and divide by the quantity of seconds passed between the two readings.

### Viewing Module Configuration

Press [C] to view the Module Configuration screen.

Use this command to display the current configuration and statistics for the module.



### Opening the Session Configuration Menu

Press **[P]** from the Main Menu Menu to open the PROFIBUS Slave menu. Use this command to view PROFIBUS Slave configuration information.

The *PROFIBUS Slave Menu* section has more information about the commands on this menu.

### Receiving the Configuration File

Press **[R]** to download (receive) the current configuration file from the module. For more information on receiving and sending configuration files, please see Uploading and Downloading the Configuration File.

### Sending the Configuration File

Press **[S]** to upload (send) an updated configuration file to the module. For more information on receiving and sending configuration files, please see Uploading and Downloading the Configuration File.

### Viewing Version Information

Press **[V]** to view Version information for the module.

Use this command to view the current version of the software for the module, as well as other important values. You may be asked to provide this information when calling for technical support on the product.

Values at the bottom of the display are important in determining module operation. The Program Scan Counter value is incremented each time a module's program cycle is complete.

**Tip:** Repeat this command at one-second intervals to determine the frequency of program execution.

### Resetting diagnostic data

Press **[U]** to reset the status counters for the client and/or servers in the module.

### Warm Booting the Module

**Caution:** Some of the commands available to you from this menu are designed for advanced debugging and system testing only, and can cause the module to stop communicating with the processor or with other devices, resulting in potential data loss or other failures. Only use these commands if you are specifically directed to do so by ProSoft Technology Technical Support staff. Some of these command keys are not listed on the menu, but are active nevertheless. Please be careful when pressing keys so that you do not accidentally execute an unwanted command.

Press **[W]** from the Main Menu to warm boot (restart) the module. This command will cause the program to exit and reload, refreshing configuration parameters that must be set on program initialization. Only use this command if you must force the module to re-boot.

Exiting the Program

**Caution:** Some of the commands available to you from this menu are designed for advanced debugging and system testing only, and can cause the module to stop communicating with the processor or with other devices, resulting in potential data loss or other failures. Only use these commands if you are specifically directed to do so by ProSoft Technology Technical Support staff. Some of these command keys are not listed on the menu, but are active nevertheless. Please be careful when pressing keys so that you do not accidentally execute an unwanted command.

Press **[Esc]** to restart the module and force all drivers to be loaded. The module will use the configuration stored in the module's Flash ROM to configure the module.

**4.4.3 PROFIBUS Slave Menu**

The PROFIBUS Slave menu provides slave (module) status information and error data.

Press **[P]** to open the PROFIBUS Slave menu.

```
PROFIBUS SLAVE MENU
C=Configuration
I=Show inputs
O=Show outputs
L=Show LED Data
I=Profibus Status
?=Show menu
M=Exit menu
```

Viewing PROFIBUS Slave Configuration

The Configuration Screen displays many specific SPC3 ASIC diagnostic data useful to ProSoft Technology Technical Support and advanced PROFIBUS users. Additional information can be found in the SPC3 specification.

```
PROFIBUS CONFIGURATION:
CONFIGURATION/BUFFER ASSIGNMENTS:
Station Address = 125
DOut Len : 200      S1=0040      S2=0108      S3=01D0
DIn Len  : 200      S1=0298      S2=0360      S3=0428
Diag1 Len: 6        S =0508      Diag2 Len: 20  S =0520
Aux1 Len : 16        S =0568      Aux2 Len : 0    S =0578
SSA len  : 0         S =N/A       Parm len : 8    S =0558
Cfg Len  : 14        S =0538      RCfg Len : 14   S =0548
Ident    : 05A5 (HEX)
FDL SAP Last Ptr = 05F8 (Value = 0xFF)
Comm Failure Mode : 1
I/O IMAGE DATA SWAPPING:
Inputs   : 0        Outputs  : 0
MODULE SETUP:
```

**Station Address** = The configured station address set by the user

**DOut Len** is the total number of output bytes with the S1, S2 and S3 values being pointers to the 3 output buffers in the SPC3 chip.

**DIn Len** is the total number of input bytes with the S1, S2 and S3 values being pointers to the 3 input buffers in the SPC3 chip.

**Diag1Len** should always be 6 to represent the minimal number of diagnostic bytes and S= pointer in SPC3 chip to this data.

**Diag2Len** is the extended diagnostic buffer length and S is a pointer to this data in the SPC3 chip.

**Aux1 Len:** (see SPC3 specification) and S is a pointer to this data in the SPC3 chip.

**Aux2 Len:** (see SPC3 specification) and S is a pointer to this data in the SPC3 chip.

**SSA Len** is not used and should be 0 and its pointer S is N/A.

**Param Len** = is the length of the parameter data for the slave with S as the pointer in the SPC3 chip to the data.

**Cfg Len** is the configuration length for the slave with S as the pointer.

**RCfg len** is that received from the master with S as the pointer.

**Ident** is the PROFIBUS identification number for the module.

**FDL SAP last PTR** is the end of all the PDPS data in the SPC3 chip. This value must be less than 0xFF or there is a memory overflow problem!

**Comm Failure mode** is that from the configuration file as is the swapping of input and output data.

### Viewing PROFIBUS Status

```

Profibus Slave Menu Selected
PROFIBUS SLAVE STATUS DATA
  Enable Status Flag      : 1
  Module State           : 4
  Product                 : V01.06PDSQ
  Status Data (Hex)      : [0]=05 [1]=08
  Diagnostic State (Hex) : 01
  Input Counter           : 16182
  Output Counter          : 39311
  Last Global Cmd (Hex)  : 00

```

#### Enable State

Indicates the initialized state of the PDPS module.

- 0 = Module is not initialized
- 1 = Module is initialized

**Module State**

Indicates the current state of the PDPS module.

- 0 = Normal Operation
- 1 = Shutdown
- 2 = File Transfer
- 3 = SPC3 ASIC problem
- 4 = Not in data exchange

**Status Register [0]**

SPC3 ASIC slave status information provided to the master.

Bit 0	Offline/Passive-Idle
	Offline-/Passive-Idle state
	0 = SPC3 is in offline
	1 = SPC3 in passive idle
Bit 1	FDL_IND_ST (Fieldbus Data link Layer)
	FDL indication is temporarily buffered.
	0 = No FDL indication is temporarily buffered.
	1 = FDL indication is temporarily buffered.
Bit 2	Diag_Flag
	Status diagnostics buffer
	0 = The DP master fetches the diagnostics buffer.
	1 = The DP master has not yet fetched the diagnostics buffer.
Bit 3	RAM Access Violation
	Memory access > 1.5kByte
	0 = No address violation
	1 = For addresses > 1536 bytes, 1024 is subtracted from the current address, and there is access to this new address.
Bits 4,5	DP-State
	DP-State Machine state
	00 = 'Wait_Prm' state
	01 = 'Wait_Cfg' state
	10 = 'DATA_EX' state
	11 = Not possible
Bits 6,7	WD-State
	Watchdog-State-Machine state
	00 = 'Baud_Search' state
	01 = 'Baud_Control' state
	10 = 'DP_Control' state
	11 = Not possible

**Bit 0****Offline/Passive-idle**

- 0 = SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer go offline.
- 1= SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer are started.

**Bit 4, 5**

- 10 = Data Exchange State is Normal. The SPC3 has a correct configuration.

**Bits 6, 7**

- Watchdog Timer
- Automatic Baud Rate Identification

The SPC3 is able to identify the baud rate automatically. The "baud search" state is located after each RESET and also after the watchdog (WD) timer has run out in the "Baud\_Control\_state." As a rule, SPC3 begins the search for the set rate with the highest baud rate. If no SD1 telegram, SD2 telegram, or SD3 telegram was received completely and without errors during the monitoring time, the search continues with the next lowest baud rate.

After identifying the correct baud rate, SPC3 switches to the "Baud\_Control" state and monitors the baud rate. The monitoring time can be parameterized (WD\_Baud\_Control\_Val). The watchdog works with a clock of 100 Hz (10 milliseconds). The watchdog resets each telegram received with no errors to its own station address. If the timer runs out, SPC3 again switches to the baud search state.

Further explanation of Status Register [0]: Word 9 Bit states**Bit 0****Offline/Passive-idle**

- 0 = SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer go offline.
- 1= SPC3 exits offline and goes to passive-idle. The idle timer and Wd timer are started.

**Bit 4, 5**

- 10 = Data Exchange State is Normal. The SPC3 has a correct configuration.

**Bits 6, 7**

- Watchdog Timer
- Automatic Baud Rate Identification

The SPC3 is able to identify the baud rate automatically. The "baud search" state is located after each RESET and also after the watchdog (WD) timer has run out in the "Baud\_Control\_state." As a rule, SPC3 begins the search for the set rate with the highest baud rate. If no SD1 telegram, SD2 telegram, or SD3 telegram was received completely and without errors during the monitoring time, the search continues with the next lowest baud rate.

After identifying the correct baud rate, SPC3 switches to the "Baud\_Control" state and monitors the baud rate. The monitoring time can be parameterized (WD\_Baud\_Control\_Val). The watchdog works with a clock of 100 Hz (10 milliseconds). The watchdog resets each telegram received with no errors to its own station address. If the timer runs out, SPC3 again switches to the baud search state.

Baud Rate Monitoring

The located baud rate is constantly monitored in 'Baud\_Control.' The watchdog is reset for each error-free telegram to its own station address. The monitoring time results from multiplying both 'WD\_Baud\_Control\_Val' (user sets the parameters) by the time base (10 ms). If the monitoring time runs out, WD\_SM again goes to 'Baud\_Search'. If the user carries out the DP protocol (DP\_Mode = 1, see Mode register 0) with SPC3, the watchdog is used for the "DP\_Control" state, after a 'Set\_Param telegram' was received with an enabled response time monitoring 'WD\_On = 1.' The watchdog timer remains in the baud rate monitoring state when there is a switched off 'WD\_On = 0' master monitoring. The PROFIBUS DP state machine is also not reset when the timer runs out. That is, the slave remains in the DATA\_Exchange state, for example.

Response Time Monitoring

The 'DP\_Control' state serves response time monitoring of the DP master (Master\_Add). The set monitoring times results from multiplying both watchdog factors and multiplying the result with the momentarily valid time base (1 ms or 10 ms):

- $TWD = (1 \text{ ms or } 10 \text{ ms}) * WD\_Fact\_1 * WD\_Fact\_2$  (See byte 7 of the parameter setting telegram.)

The user can load the two watchdog factors (WD\_Fact\_1, and WD\_Fact\_2) and the time base that represents a measurement for the monitoring time via the 'Set\_Param telegram' with any value between 1 and 255.

EXCEPTION: The WD\_Fact\_1=WD\_Fact\_2=1 setting is not permissible. The circuit does not check this setting.

Monitoring times between 2 ms and 650 s - independent of the baud rate - can be implemented with the permissible watchdog factors. If the monitoring time runs out, the SPC3 goes again to 'Baud\_Control,' and the SPC3 generates the 'WD\_DP\_Control\_Timeout-Interrupt'. In addition, the DP\_State machine is reset, that is, generates the reset states of the buffer management.

If another master accepts SPC3, then there is either a switch to 'Baud\_Control' (WD\_On = 0), or there is a delay in 'DP\_Control' (WD\_On = 1), depending on the enabled response time monitoring (WD\_On = 0).

**Status Register [1]**

SPC3 ASIC slave status information provided to the master.

Bits	Baud rate:
0 to 3	The baud rates SPC3 found
	0000 = 12 MBaud
	0001 = 6 MBaud
	0010 = 3 MBaud
	0011 = 1.5 MBaud
	0100 = 500 kBaud
	0101 = 187.5 kBaud
	0110 = 93.75 kBaud
	0111 = 45.45 kBaud
	1000 = 19.2 kBaud
	1001 = 9.6 kBaud
	Rest = Not possible
Bits	SPC3-Release:
4 to 7	Release no. for SPC3
	0000 = Release 0
	Rest = Not possible

**Diagnostic State**

- 0 = Normal Operation or not in data exchange with Status Register [0] Bit 0x20 set.
- 1 = Not in data exchange state with the Status Register [0] bit 0x20 not set or normal operation with the Status Register [0] bit 0x20 not set.
- 3 = Not in a defined state or in module state 1, 2 or 3.
- 4 = Normal operation with Status Register [0] bit 0x20 set

**PROFIBUS Input Counter**

Input counter is incremented each time the input data is updated.

**PROFIBUS Output Counter**

Output counter is incremented each time the output data is updated.

**Last Global Command**

The value of the last global command code received from the master.

Bit	Designation	Significance
0	Reserved	
1	Clear_Data	With this command the ASCII output data is deleted in data transfer buffer and is changed to next transfer data buffer contents.
2	Unfreeze	With 'Unfreeze': freezing input data is cancelled.
3	Freeze	The ASCII input data is fetched from next transfer buffer to data transfer buffer and frozen. New input data is not fetched again until the master sends the next 'Freeze' command.
4	Unsync	The 'Unsync' command cancels the 'Sync' command.
5	Sync	The ASCII output data transferred with a WRITE_READ_DATA telegram is changed from data transfer buffer next state buffer. The following transferred output data is kept in data transfer buffer until the next 'Sync' command is given.
6,7	Reserved	The Reserved designation specifies that these bits are reserved for future function expansions.





## 5 Reference

### *In This Chapter*

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### 5.1 GSD File - prlx05a5.gsd

```

;=====
; Profibus Device Database of:
;   ProLinx Communication Gateways, Inc.
;   Model: ProLinx Profibus Slave
;   Description: Profibus DP Slave
;   Language: English
;   Date: 01.16.2006
;   Author: ProLinx Communication Gateways, Inc.
;   Rev   Date       Description
;   A    01/16/06   Max_Output_Len and Max_Input_Len increased to 244
;=====
#Profibus_DP

GSD_Revision      = 2

;These are text strings associated with each parameter
;This application only uses one parameter byte required
;by the SPC3 ASIC.
ExtUserPrmData=0 "SPC3 User Prm Byte"          ;
Unsigned8 0 0-7
EndExtUserPrmData

; Device identification
Vendor_Name="ProLinx Comm Gateways Inc."
Model_Name      = "ProLinx Profibus Slave"
Revision        = "Version 1.00"
Ident_Number    = 0x05A5
Protocol_Ident  = 0          ; DP protocol
Station_Type    = 0          ; Slave device
FMS_supp       = 0          ; FMS not supported
Hardware_Release = "Rev. 1.00"
Software_Release = "Rev. 1.00"

; Supported baudrates
9.6_supp = 1
19.2_supp = 1
45.45_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1

```

```

3M_supp=1
6M_supp=1
12M_supp=1

; Maximum responder time for supported baudrates
MaxTsdR_9.6 = 60
MaxTsdR_19.2 = 60
MaxTsdR_45.45 = 250
MaxTsdR_93.75 = 60
MaxTsdR_187.5 = 60
MaxTsdR_500 = 100
MaxTsdR_1.5M = 150
MaxTsdR_3M = 250
MaxTsdR_6M = 450
MaxTsdR_12M = 800

; Supported hardware features
Redundancy          = 0          ; not supported
Repeater_Ctrl_Sig  = 2          ; TTL
24V_Pins           = 0          ; not connected
Implementation_Type = "SPC3"

; Supported DP features
Freeze_Mode_supp   = 1          ; supported
Sync_Mode_supp     = 1          ; supported
Auto_Baud_supp     = 1          ; supported
Set_Slave_Add_supp = 0          ; not supported

;
;--Slave specific data-----
Bitmap_Device = "ProLnx_R"
Bitmap_Diag   = "ProLnx_D"
Bitmap_SF     = "ProLnx_S"

; Default Length of User Parameter
User_Prm_Data_Len = 1

; Default User Parameter string:
User_Prm_Data      = 0x00
Ext_User_Prm_Data_Const(0)= 0x00
Ext_User_Prm_Data_Ref(0)=0

; Maximum polling frequency
Min_Slave_Intervall = 1          ;100 µs

; Maximum supported sizes
Modular_Station = 1          ; modular
Max_Module      = 14          ; logical modules emulated on the card
Max_Input_Len   = 244
Max_Output_Len  = 244
Max_Data_Len    = 400
Modul_Offset=0

Slave_Family=9
Max_Diag_Data_Len = 20

;Refer to the ProSoft Profibus Slave documentation for a complete discussion of

```

```
;the extended diagnostic data.

;
; Module byte-organised send data
;
Module = "Empty Slot" 0x00
EndModule
;
; Module word size send data
;
Module = "1 Word Input" 0x50
EndModule
Module = "2 Words Input" 0x51
EndModule
Module = "3 Words Input" 0x52
EndModule
Module = "4 Words Input" 0x53
EndModule
Module = "5 Words Input" 0x54
EndModule
Module = "6 Words Input" 0x55
EndModule
Module = "7 Words Input" 0x56
EndModule
Module = "8 Words Input" 0x57
EndModule
Module = "9 Words Input" 0x58
EndModule
Module = "10 Words Input" 0x59
EndModule
Module = "11 Words Input" 0x5A
EndModule
Module = "12 Words Input" 0x5B
EndModule
Module = "13 Words Input" 0x5C
EndModule
Module = "14 Words Input" 0x5D
EndModule
Module = "15 Words Input" 0x5E
EndModule
Module = "16 Words Input" 0x5F
EndModule

;
; Module word size receive data
;
Module = "1 Word Output" 0x60
EndModule
Module = "2 Words Output" 0x61
EndModule
Module = "3 Words Output" 0x62
EndModule
Module = "4 Words Output" 0x63
EndModule
Module = "5 Words Output" 0x64
EndModule
Module = "6 Words Output" 0x65
```

---

```
EndModule
Module = "7 Words Output" 0x66
EndModule
Module = "8 Words Output" 0x67
EndModule
Module = "9 Words Output" 0x68
EndModule
Module = "10 Words Output" 0x69
EndModule
Module = "11 Words Output" 0x6A
EndModule
Module = "12 Words Output" 0x6B
EndModule
Module = "13 Words Output" 0x6C
EndModule
Module = "14 Words Output" 0x6D
EndModule
Module = "15 Words Output" 0x6E
EndModule
Module = "16 Words Output" 0x6F
EndModule
```

## 6 Support, Service & Warranty

### *In This Chapter*

- ❖ How to Contact Us: Technical Support..... 53
- ❖ Return Material Authorization (RMA) Policies and Conditions..... 54
- ❖ LIMITED WARRANTY..... 55

ProSoft Technology, Inc. (ProSoft) is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

- 1 Product Version Number
- 2 System architecture
- 3 Network details

If the issue is hardware related, we will also need information regarding:

- 1 Module configuration and contents of file
  - Module Operation
  - Configuration/Debug status information
  - LED patterns
- 2 Information about the processor and user data files as viewed through and LED patterns on the processor.
- 3 Details about the serial devices interfaced, if any.

### 6.1 How to Contact Us: Technical Support

---

<b>Internet</b>	Web Site: <a href="http://www.prosoft-technology.com/support">http://www.prosoft-technology.com/support</a> E-mail address: <a href="mailto:support@prosoft-technology.com">support@prosoft-technology.com</a>
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#### **Asia Pacific**

+603.7724.2080, [support.asia@prosoft-technology.com](mailto:support.asia@prosoft-technology.com)  
Languages spoken include: Chinese, English

#### **Europe (location in Toulouse, France)**

+33 (0) 5.34.36.87.20, [support.EMEA@prosoft-technology.com](mailto:support.EMEA@prosoft-technology.com)  
Languages spoken include: French, English

#### **North America/Latin America (excluding Brasil) (location in California)**

+1.661.716.5100, [support@prosoft-technology.com](mailto:support@prosoft-technology.com)  
Languages spoken include: English, Spanish

*For technical support calls within the United States, an after-hours answering system allows pager access to one of our qualified technical and/or application support engineers at any time to answer your questions.*

#### **Brasil (location in Sao Paulo)**

+55-11-5084-5178, [eduardo@prosoft-technology.com](mailto:eduardo@prosoft-technology.com)  
Languages spoken include: Portuguese, English

## 6.2 Return Material Authorization (RMA) Policies and Conditions

The following RMA Policies and Conditions (collectively, "RMA Policies") apply to any returned Product. These RMA Policies are subject to change by ProSoft without notice. For warranty information, see "Limited Warranty". In the event of any inconsistency between the RMA Policies and the Warranty, the Warranty shall govern.

### 6.2.1 All Product Returns:

- a) In order to return a Product for repair, exchange or otherwise, the Customer must obtain a Returned Material Authorization (RMA) number from ProSoft and comply with ProSoft shipping instructions.
- b) In the event that the Customer experiences a problem with the Product for any reason, Customer should contact ProSoft Technical Support at one of the telephone numbers listed above (page 53). A Technical Support Engineer will request that you perform several tests in an attempt to isolate the problem. If after completing these tests, the Product is found to be the source of the problem, we will issue an RMA.
- c) All returned Products must be shipped freight prepaid, in the original shipping container or equivalent, to the location specified by ProSoft, and be accompanied by proof of purchase and receipt date. The RMA number is to be prominently marked on the outside of the shipping box. Customer agrees to insure the Product or assume the risk of loss or damage in transit. Products shipped to ProSoft using a shipment method other than that specified by ProSoft or shipped without an RMA number will be returned to the Customer, freight collect. Contact ProSoft Technical Support for further information.
- d) A 10% restocking fee applies to all warranty credit returns whereby a Customer has an application change, ordered too many, does not need, etc.

### 6.2.2 Procedures for Return of Units Under Warranty:

A Technical Support Engineer must approve the return of Product under ProSoft's Warranty:

- a) A replacement module will be shipped and invoiced. A purchase order will be required.
- b) Credit for a product under warranty will be issued upon receipt of authorized product by ProSoft at designated location referenced on the Return Material Authorization.

### 6.2.3 Procedures for Return of Units Out of Warranty:

- a) Customer sends unit in for evaluation
- b) If no defect is found, Customer will be charged the equivalent of \$100 USD, plus freight charges, duties and taxes as applicable. A new purchase order will be required.

- c) If unit is repaired, charge to Customer will be 30% of current list price (USD) plus freight charges, duties and taxes as applicable. A new purchase order will be required or authorization to use the purchase order submitted for evaluation fee.

The following is a list of non-repairable units:

- 3150 - All
- 3750
- 3600 - All
- 3700
- 3170 - All
- 3250
- 1560 - Can be repaired, only if defect is the power supply
- 1550 - Can be repaired, only if defect is the power supply
- 3350
- 3300
- 1500 - All

#### **6.2.4 Purchasing Warranty Extension:**

- a) ProSoft's standard warranty period is three (3) years from the date of shipment as detailed in "Limited Warranty (page 55)". The Warranty Period may be extended at the time of equipment purchase for an additional charge, as follows:
- Additional 1 year = 10% of list price
  - Additional 2 years = 20% of list price
  - Additional 3 years = 30% of list price

### **6.3 LIMITED WARRANTY**

This Limited Warranty ("Warranty") governs all sales of hardware, software and other products (collectively, "Product") manufactured and/or offered for sale by ProSoft, and all related services provided by ProSoft, including maintenance, repair, warranty exchange, and service programs (collectively, "Services"). By purchasing or using the Product or Services, the individual or entity purchasing or using the Product or Services ("Customer") agrees to all of the terms and provisions (collectively, the "Terms") of this Limited Warranty. All sales of software or other intellectual property are, in addition, subject to any license agreement accompanying such software or other intellectual property.

### **6.3.1 What Is Covered By This Warranty**

- a) *Warranty On New Products:* ProSoft warrants, to the original purchaser, that the Product that is the subject of the sale will (1) conform to and perform in accordance with published specifications prepared, approved and issued by ProSoft, and (2) will be free from defects in material or workmanship; provided these warranties only cover Product that is sold as new. This Warranty expires three years from the date of shipment (the "Warranty Period"). If the Customer discovers within the Warranty Period a failure of the Product to conform to specifications, or a defect in material or workmanship of the Product, the Customer must promptly notify ProSoft by fax, email or telephone. In no event may that notification be received by ProSoft later than 39 months. Within a reasonable time after notification, ProSoft will correct any failure of the Product to conform to specifications or any defect in material or workmanship of the Product, with either new or used replacement parts. Such repair, including both parts and labor, will be performed at ProSoft's expense. All warranty service will be performed at service centers designated by ProSoft.
- b) *Warranty On Services:* Materials and labor performed by ProSoft to repair a verified malfunction or defect are warranted in the terms specified above for new Product, provided said warranty will be for the period remaining on the original new equipment warranty or, if the original warranty is no longer in effect, for a period of 90 days from the date of repair.

### **6.3.2 What Is Not Covered By This Warranty**

- a) ProSoft makes no representation or warranty, expressed or implied, that the operation of software purchased from ProSoft will be uninterrupted or error free or that the functions contained in the software will meet or satisfy the purchaser's intended use or requirements; the Customer assumes complete responsibility for decisions made or actions taken based on information obtained using ProSoft software.
- b) This Warranty does not cover the failure of the Product to perform specified functions, or any other non-conformance, defects, losses or damages caused by or attributable to any of the following: (i) shipping; (ii) improper installation or other failure of Customer to adhere to ProSoft's specifications or instructions; (iii) unauthorized repair or maintenance; (iv) attachments, equipment, options, parts, software, or user-created programming (including, but not limited to, programs developed with any IEC 61131-3, "C" or any variant of "C" programming languages) not furnished by ProSoft; (v) use of the Product for purposes other than those for which it was designed; (vi) any other abuse, misapplication, neglect or misuse by the Customer; (vii) accident, improper testing or causes external to the Product such as, but not limited to, exposure to extremes of temperature or humidity, power failure or power surges; or (viii) disasters such as fire, flood, earthquake, wind and lightning.



- c) The information in this Agreement is subject to change without notice. ProSoft shall not be liable for technical or editorial errors or omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance or use of this material. The user guide included with your original product purchase from ProSoft contains information protected by copyright. No part of the guide may be duplicated or reproduced in any form without prior written consent from ProSoft.

### **6.3.3 Disclaimer Regarding High Risk Activities**

Product manufactured or supplied by ProSoft is not fault tolerant and is not designed, manufactured or intended for use in hazardous environments requiring fail-safe performance including and without limitation: the operation of nuclear facilities, aircraft navigation of communication systems, air traffic control, direct life support machines or weapons systems in which the failure of the product could lead directly or indirectly to death, personal injury or severe physical or environmental damage (collectively, "high risk activities"). ProSoft specifically disclaims any express or implied warranty of fitness for high risk activities.

### **6.3.4 Intellectual Property Indemnity**

Buyer shall indemnify and hold harmless ProSoft and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not ProSoft is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless ProSoft and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party. ProSoft makes no warranty that the product is or will be delivered free of any person's claiming of patent, trademark, or similar infringement. The Buyer assumes all risks (including the risk of suit) that the product or any use of the product will infringe existing or subsequently issued patents, trademarks, or copyrights.

- a) Any documentation included with Product purchased from ProSoft is protected by copyright and may not be duplicated or reproduced in any form without prior written consent from ProSoft.
- b) ProSoft's technical specifications and documentation that are included with the Product are subject to editing and modification without notice.
- c) Transfer of title shall not operate to convey to Customer any right to make, or have made, any Product supplied by ProSoft.
- d) Customer is granted no right or license to use any software or other intellectual property in any manner or for any purpose not expressly permitted by any license agreement accompanying such software or other intellectual property.

- e) Customer agrees that it shall not, and shall not authorize others to, copy software provided by ProSoft (except as expressly permitted in any license agreement accompanying such software); transfer software to a third party separately from the Product; modify, alter, translate, decode, decompile, disassemble, reverse-engineer or otherwise attempt to derive the source code of the software or create derivative works based on the software; export the software or underlying technology in contravention of applicable US and international export laws and regulations; or use the software other than as authorized in connection with use of Product.
- f) **Additional Restrictions Relating To Software And Other Intellectual Property**

In addition to compliance with the Terms of this Warranty, Customers purchasing software or other intellectual property shall comply with any license agreement accompanying such software or other intellectual property. Failure to do so may void this Warranty with respect to such software and/or other intellectual property.

### **6.3.5 Disclaimer of all Other Warranties**

The Warranty set forth in What Is Covered By This Warranty (page 56) are in lieu of all other warranties, express or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

### **6.3.6 Limitation of Remedies \*\***

In no event will ProSoft or its Dealer be liable for any special, incidental or consequential damages based on breach of warranty, breach of contract, negligence, strict tort or any other legal theory. Damages that ProSoft or its Dealer will not be responsible for included, but are not limited to: Loss of profits; loss of savings or revenue; loss of use of the product or any associated equipment; loss of data; cost of capital; cost of any substitute equipment, facilities, or services; downtime; the claims of third parties including, customers of the Purchaser; and, injury to property.

\*\* Some areas do not allow time limitations on an implied warranty, or allow the exclusion or limitation of incidental or consequential damages. In such areas, the above limitations may not apply. This Warranty gives you specific legal rights, and you may also have other rights which vary from place to place.

### **6.3.7 Time Limit for Bringing Suit**

Any action for breach of warranty must be commenced within 39 months following shipment of the Product.

### **6.3.8 No Other Warranties**

Unless modified in writing and signed by both parties, this Warranty is understood to be the complete and exclusive agreement between the parties, suspending all oral or written prior agreements and all other communications between the parties relating to the subject matter of this Warranty, including statements made by salesperson. No employee of ProSoft or any other party is authorized to make any warranty in addition to those made in this Warranty. The Customer is warned, therefore, to check this Warranty carefully to see that it correctly reflects those terms that are important to the Customer.

### **6.3.9 Allocation of Risks**

This Warranty allocates the risk of product failure between ProSoft and the Customer. This allocation is recognized by both parties and is reflected in the price of the goods. The Customer acknowledges that it has read this Warranty, understands it, and is bound by its Terms.

### **6.3.10 Controlling Law and Severability**

This Warranty shall be governed by and construed in accordance with the laws of the United States and the domestic laws of the State of California, without reference to its conflicts of law provisions. If for any reason a court of competent jurisdiction finds any provisions of this Warranty, or a portion thereof, to be unenforceable, that provision shall be enforced to the maximum extent permissible and the remainder of this Warranty shall remain in full force and effect. Any cause of action with respect to the Product or Services must be instituted in a court of competent jurisdiction in the State of California.

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