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MVI46-PDPS
SLC Platform

Profibus DP Slave Communication Module

USER MANUAL

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MVI46-PDPS User Manual

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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:

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIV. 2;

WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES

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

Class 2 Power

MVI (Multi Vendor Interface) Modules

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'ÉQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

Warnings

North America Warnings

A Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
B Warning - Explosion Hazard - When in Hazardous Locations, turn off power before replacing or rewiring modules.
Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.
C Suitable for use in Class I, division 2 Groups A, B, C and D Hazardous Locations or Non-Hazardous Locations.

ATEX Warnings and Conditions of Safe Usage:

Power, Input, and Output (I/O) wiring must be in accordance with the authority having jurisdiction

A Warning - Explosion Hazard - When in hazardous locations, turn off power before replacing or wiring modules.
B Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
C These products are intended to be mounted in an IP54 enclosure. The devices shall provide external means to prevent the rated voltage being exceeded by transient disturbances of more than 40%. This device must be used only with ATEX certified backplanes.
D DO NOT OPEN WHEN ENERGIZED.

Warning: This module is not hot-swappable! Always remove power from the rack before inserting or removing this module, or damage may result to the module, the processor, or other connected devices.

Battery Life Advisory

The MVI46, MVI56, MVI56E, MVI69, and MVI71 modules use a rechargeable Lithium Vanadium Pentoxide battery to backup the real-time clock and CMOS. The battery should last for the life of the module. The module must be powered for approximately twenty hours before the battery becomes fully charged. After it is fully charged, the battery provides backup power for the CMOS setup and the real-time clock for approximately 21 days. When the battery is fully discharged, the module will revert to the default BIOS and clock settings.

Note: The battery is not user replaceable.

For professional users in the European Union
If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

Prop 65 Warning – Cancer and Reproductive Harm – www.P65Warnings.ca.gov

Agency Approvals & Certifications

Please visit our website: www.prosoft-technology.com

Contents

1   Start Here

In This Chapter

To get the most benefit from this User Manual, you should have the following skills:

- **Rockwell Automation® RSLogix™ software:** launch the program, configure ladder logic, and transfer the ladder logic to the processor
- **Microsoft Windows®:** install and launch programs, execute menu commands, navigate dialog boxes, and enter data
- **Hardware installation and wiring:** install the module, and safely connect PROFIBUS DP and SLC devices to a power source and to the MVI46-PDPS's application port(s)

1.1   System Requirements

The MVI46-PDPS module requires the following minimum hardware and software components:

- Rockwell Automation SLC 5/02 M0/M1 capable processors (or newer), with compatible power supply and one free slot in the rack, for the MVI46-PDPS module. The module requires 800mA of available power.
- Rockwell Automation RSLogix 500 programming software.
- Rockwell Automation RSLinx communication software
- Pentium® II 500 MHz minimum. Pentium III 733 MHz (or better) recommended
- Supported operating systems:
  - o Microsoft Windows 10
  - o Microsoft Windows 7 Professional (32-or 64-bit)
  - o Microsoft Windows XP Professional with Service Pack 1 or 2
  - o Microsoft Windows Vista
  - o Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
  - o Microsoft Windows Server 2003
- 32 Mbytes of RAM minimum, 64 Mbytes of RAM recommended
- 50 Mbytes of free hard disk space (or more based on application requirements)
- 16-color VGA graphics adapter, 640 x 480 minimum resolution (256 Color 800 × 600 recommended)

1.2   Package Contents

The following components are included with your MVI46-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	MVI46-PDPS Module	MVI46-PDPS	Profibus DP Slave Communication Module
1	Cable	Cable #15, RS-232 Null Modem	For RS-232 Connection to the CFG Port
1	Cable	Cable #14, RJ45 to DB9 Male Adapter cable	For DB9 Connection to Module's Port

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

1.3   Installing ProSoft Configuration Builder Software

You must install the *ProSoft Configuration Builder* (PCB) software to configure the module. You can always get the newest version of ProSoft Configuration Builder from the ProSoft Technology website (http://www.prosoft-technology.com). The filename contains the version of PCB. For example, **PCB_4.4.3.4.0245.exe**.

To install ProSoft Configuration Builder from the ProSoft Technology website

1   Open your web browser and navigate to www.prosoft-technology.com.
2   Search for '*PCB*' or '*ProSoft Configuration Builder*'.
3   Click on the ProSoft Configuration Builder search result link.
4   From the *Downloads* link, download the latest version of *ProSoft Configuration Builder*.
5   Choose **SAVE** or **SAVE FILE**, if prompted.
6   Save the file to your *Windows Desktop*, so that you can find it easily when you have finished downloading.
7   When the download is complete, locate and open the file, and then follow the instructions on your screen to install the program.

Note: To use the RS Logix 500 under the Windows 7 OS, you must be sure to install it using the *Run as Administrator* option. To find this option, right-click the Setup.exe program icon, and then click **RUN AS ADMINISTRATOR** on the context menu. You must install using this option even if you are already logged in as an Administrator on your network or personal computer (PC). Using the *Run as Administrator* option allows the installation program to create folders and files on your PC with proper permissions and security.

If you do not use the *Run as Administrator* option, the RS Logix 500 may appear to install correctly, but you will receive multiple file access errors whenever the RS Logix 500 is running, especially when changing configuration screens. If this happens, you must completely uninstall the RS Logix 500 and then re-install using the *Run as Administrator* option to eliminate the errors.

1.4   Setting Jumpers

The Setup Jumper acts as "write protection" for the module's firmware. In "write protected" mode, the Setup pins are not connected, and the module's firmware cannot be overwritten. The module is shipped with the Setup jumper OFF. Do not jumper the Setup pins together unless you are directed to do so by ProSoft Technical Support (or you want to update the module firmware).

The following illustration shows the MVI46-PDPS jumper configuration with the Setup Jumper OFF.
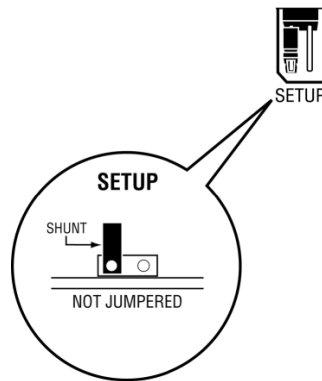
Note: If you are installing the module in a remote rack, you may prefer to leave the Setup pins jumpered. That way, you can update the module's firmware without requiring physical access to the module.

1.5   Installing the Module in the Rack

If you have not already installed and configured your SLC processor and power supply, please do so before installing the MVI46-PDPS module. Refer to your Rockwell Automation product documentation for installation instructions.

Warning: You must follow all safety instructions when installing this or any other electronic devices. Failure to follow safety procedures could result in damage to hardware or data, or even serious injury or death to personnel. Refer to the documentation for each device you plan to connect to verify that suitable safety procedures are in place before installing or servicing the device.

After you have checked the placement of the jumpers, insert the MVI46-PDPS into the SLC™ chassis. Use the same technique recommended by Rockwell Automation to remove and install SLC™ modules.

Warning: This module is not hot-swappable! Always remove power from the rack before inserting or removing this module, or damage may result to the module, the processor, or other connected devices.

1 Turn power OFF.
2 Align the module with the top and bottom guides, and slide it into the rack until the module is firmly against the backplane connector.
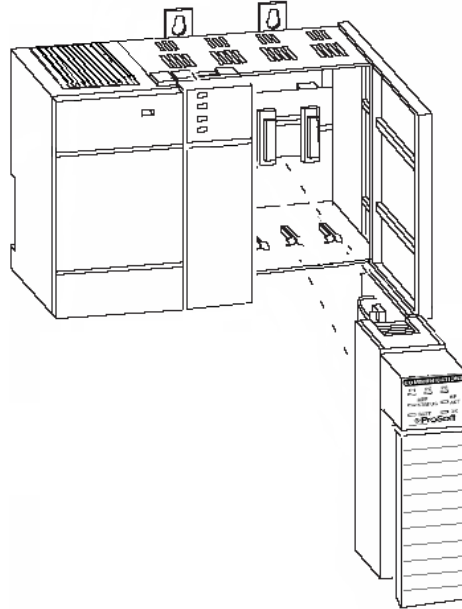
3 With a firm but steady push, snap the module into place.
4 Check that the holding clips on the top and bottom of the module are securely in the locking holes of the rack.
5 Make a note of the slot location. You will need to identify the slot in which the module is installed in order for the sample program to work correctly. Slot numbers are identified on the green circuit board (backplane) of the SLC rack.
6 Turn power ON.

Note: If you insert the module improperly, the system may stop working, or may behave unpredictably.

1.6   Connecting Your PC to the Processor

1   Connect the right-angle connector end of the cable to your controller at the
        communications port.
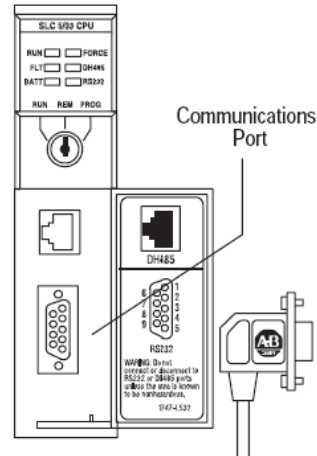
2   Connect the straight connector end of the cable to the serial port on your computer.
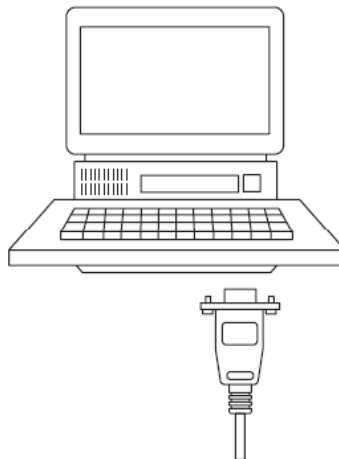
1.7   Downloading the Sample Program to the Processor

Note: The key switch on the front of the SLC processor must be in the REM position.

1   If you are not already online to the processor, open the **COMMUNICATIONS** menu, and then choose **DOWNLOAD**. RSLogix will establish communication with the processor.
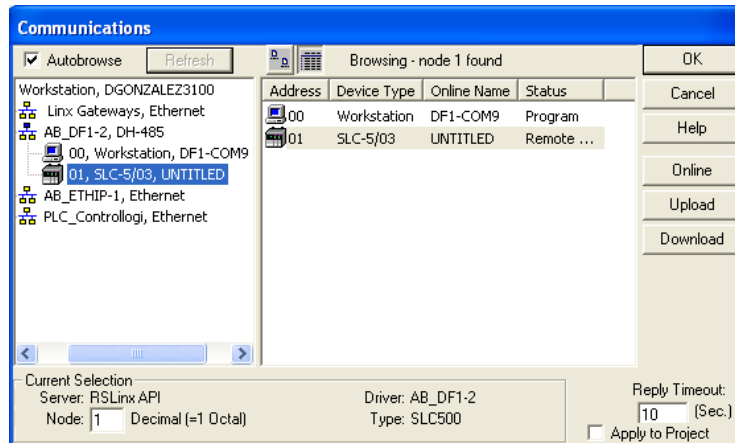
2   Click the **DOWNLOAD** button to transfer the sample program to the processor.
3   RSLogix will compile the program and transfer it to the processor. This process may take a few minutes.
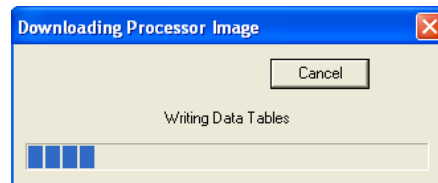
4   When the download is complete, RSLogix will open another confirmation dialog box. Click **YES** to switch the processor from Program mode to Run mode.
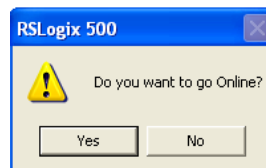
Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

1.7.1 Configuring the RSLinx Driver for the PC COM Port

When trying to connect serially, if RSLogix is unable to establish communication with the processor, follow these steps.

1 Open *RSLinx.*
2 Open the **COMMUNICATIONS** menu, and click **CONFIGURE DRIVERS**.
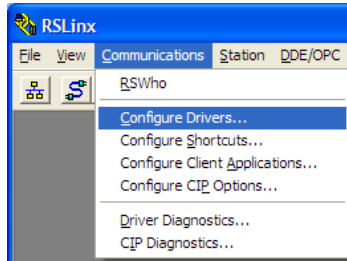
This action opens the *Configure Drivers* dialog box.
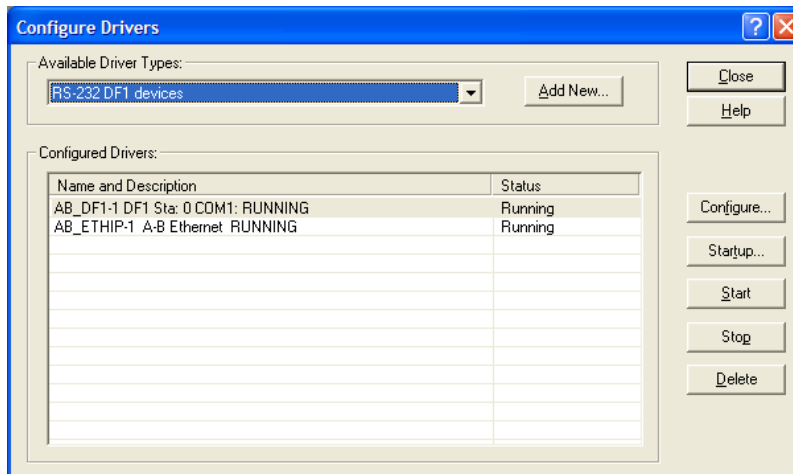
Note: If the list of configured drivers is blank, you must first choose and configure a driver from the *Available Driver Types* list. The recommended driver type to choose for serial communication with the processor is *RS-232 DF1 Devices*.

3 Click to select the driver, and then click **CONFIGURE**. This action opens the *Configure RS-232 DF1 Devices* dialog box.
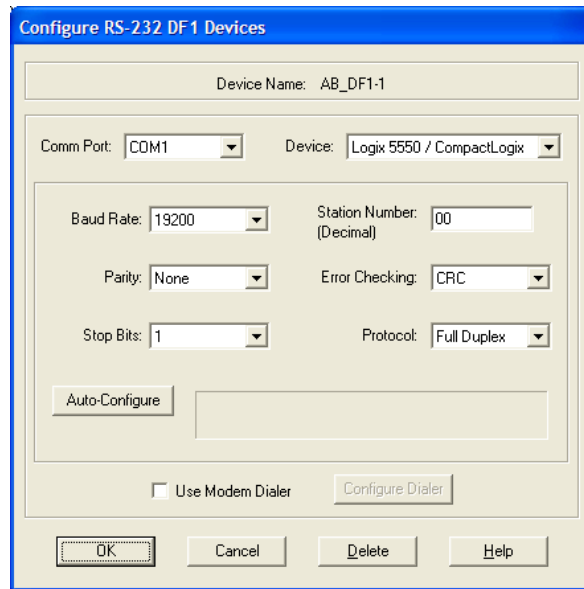
4 Click the **AUTO-CONFIGURE** button. RSLinx will attempt to configure your serial port to work with the selected driver.
5 When you see the message *Auto Configuration Successful*, click the **OK** button to dismiss the dialog box.

Note: If the auto-configuration procedure fails, verify that the cables are connected correctly between the processor and the serial port on your computer, and then try again. If you are still unable to auto-configure the port, refer to your RSLinx documentation for further troubleshooting steps.

1.8 Connecting Your PC to the Module

With the module securely mounted, connect your PC to the Configuration/Debug port using the RJ45-DB-9 Serial Adapter Cable and the Null Modem Cable included in the package with the MVI46-PDPS module.

1 Connect the RJ45-DB-9 Serial Adapter Cable to the Null Modem Cable.
2 Insert the RJ45 cable connector from the RJ45-DB-9 cable into the Configuration/Debug port of the module.
3 Attach the other end to the serial port on your PC.

2   MVI46-PDPS Configuration

In This Chapter

2.1   Using ProSoft Configuration Builder

ProSoft Configuration Builder (PCB) provides a quick and easy way to manage module configuration files customized to meet your application needs. PCB allows you to import information from previously installed (known working) configurations to new projects.

2.1.1 Setting Up the Project

To begin, start **PROSOFT CONFIGURATION BUILDER** (PCB).
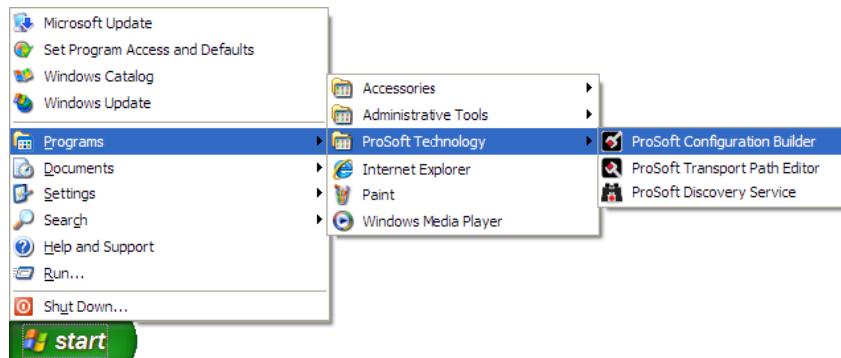
If you have used other Windows configuration tools before, you will find the screen layout familiar. PCB's window consists of a tree view on the left, and an information pane and a configuration pane on the right side of the window. When you first start *PCB*, the tree view consists of folders for **DEFAULT PROJECT** and **DEFAULT LOCATION**, with a **DEFAULT MODULE** in the Default Location folder. The following illustration shows the *PCB* window with a new project.
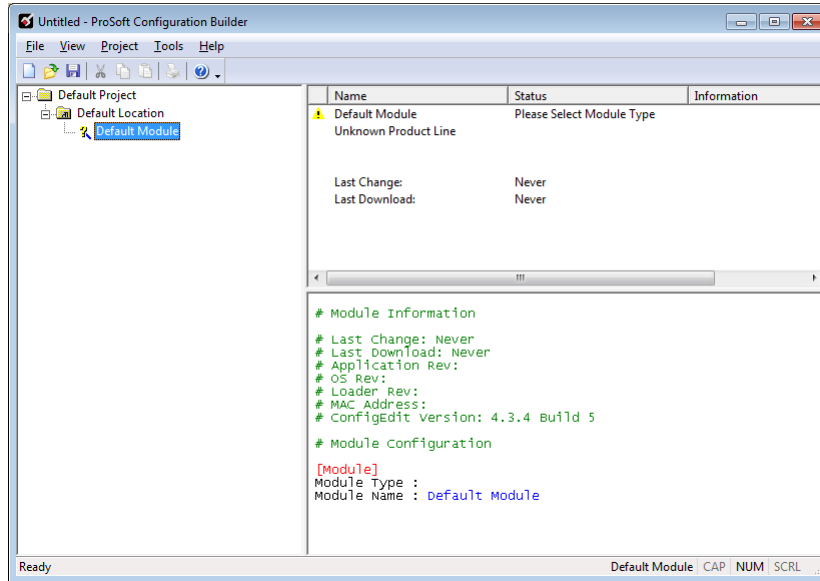
Your first task is to add the MVI46-PDPS module to the project.

1   Use the mouse to select "Default Module" in the tree view, and then click the right mouse button to open a shortcut menu.
2   On the shortcut menu, choose "Choose Module Type". This action opens the Choose Module Type dialog box.
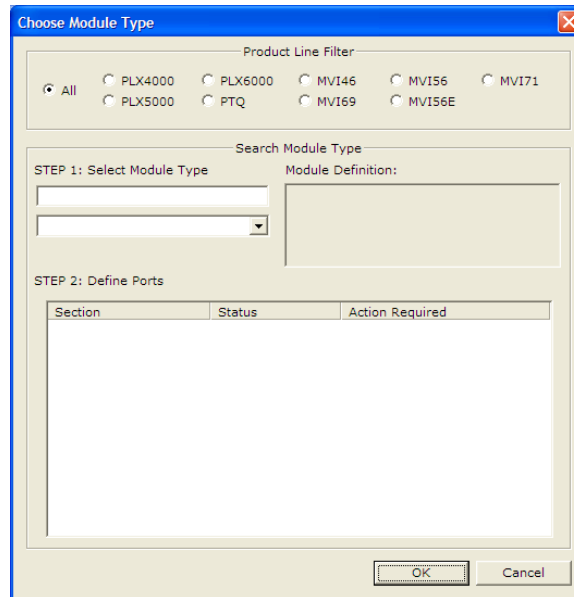
3   In the **PRODUCT LINE FILTER** area of the dialog box, select MVI46.

4   In the **SELECT MODULE TYPE** dropdown list, select MVI46-PDPS, and then click **OK** to save your settings and return to the ProSoft Configuration Builder window.

The next task is to set the module parameters.

2.1.2   Renaming PCB Objects

You can rename objects such as the *Default Project* and *Default Location* folders in the tree view. You can also rename the **MODULE** icon to customize the project.

1   Right-click the object you want to rename and then choose **RENAME.**

2   Type the new name for the object and press **Enter**.

Configuring Module Parameters

1   Click the **[+]** sign next to the module icon to expand module information.

2   Click the **[+]** sign next to any 🖧 icon to view module information and configuration options.

3   Double-click any 🗒 icon to open an *Edit* dialog box.

4   To edit a parameter, select the parameter in the left pane and make your changes in the right pane.

5   Click **OK** to save your changes.

Printing a Configuration File

1   In the main PCB window, right-click the **MVI46-PDPS MODULE** icon and then choose **VIEW CONFIGURATION**.

2   In the *View Configuration* dialog box, click the **FILE** menu and click **PRINT**.

3   In the *Print* dialog box, choose the printer to use from the drop-down list, select the printing options, and click **OK**.

2.2   [BACKPLANE]

The backplane section contains the data that applies to the backplane data transfer parameters.

[Section]/Item	Value	Range	Description
[BACKPLANE]			Configuration header for general Backplane information
Read Register Count	122	0 to 122	Number of words to move from the PDPS Module to controller tags in the processor (PROFIBUS Output).
Write Register Count	122	0 or 122	Number of words to move from controller tags in the processor to the PDPS module (PROFIBUS Input).

2.3   [PROFIBUS SLAVE]

The PROFIBUS Slave section contains PROFIBUS Slave parameter data.

2.3.1   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

2.3.2   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.

2.3.3   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.

2.3.4   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 upon PROFIBUS communication failure.

If the parameter is set to "No xfer on fail", the output image will not be transferred and the last values will be retained.

If the parameter is set to "xfer on comm fail", the output image will continue to be transferred.

2.3.5   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.

2.4 Downloading the Configuration to the Module Using Serial

For the module to use the settings you configured, you must download (copy) the updated *Project* file from your PC to the module. See Connecting the PC to the Module's Ethernet Port.

Note: The first time you download the project to the module, you must use the serial COM port to download the project, including the IP address. After that, you can use the Ethernet port to communicate with the module.

To download the project file

1 In the tree view in *RS Logix 500*, right-click the module icon, and choose **DOWNLOAD FROM PC TO DEVICE**. The program scans your PC for a valid com port (this may take a few seconds). When the *RS Logix 500* finds a valid COM port, it opens the *Download files from PC to module* dialog box.
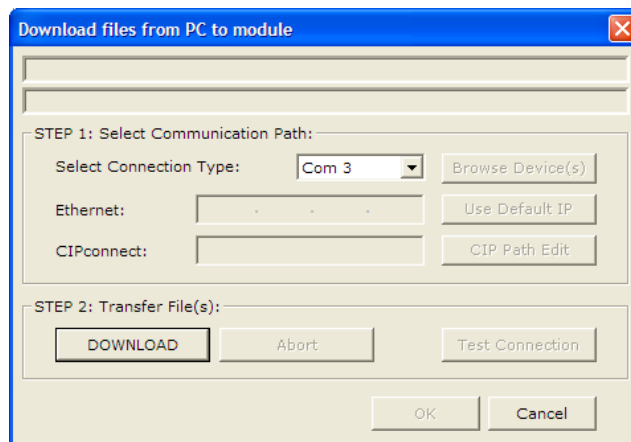
2 Choose the COM port to use from the dropdown list, and then click **DOWNLOAD**.

The module performs a platform check to read and load its new settings. When the platform check is complete, the status bar in the *Download files* dialog box displays the message *Module Running*.
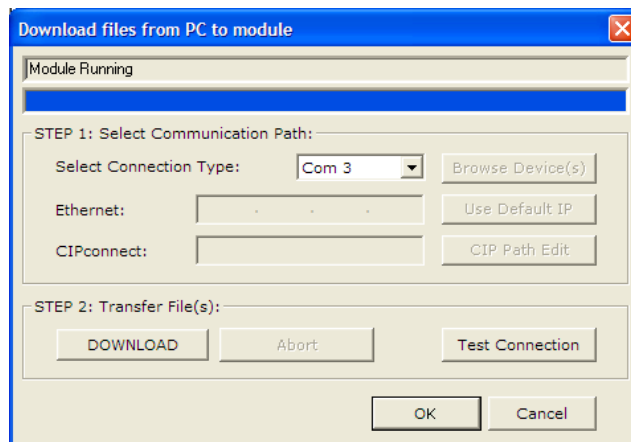
3   Ladder Logic

In This Chapter

Ladder logic is required for the MVI46-PDPS module to operate. Tasks that must be handled by the ladder logic are module data transfer, special block handling, and status data receipt. Additionally, a power-up handler may be needed to handle the initialization of the module's data and to clear any processor fault conditions.

The sample ladder logic is extensively commented, to provide information on the purpose and function of each rung. For most applications, the sample ladder will work without modification.

3.1   Module Data

All data related to the MVI46-PDPS module is stored in user defined data files and the module's M1 file. Additionally, a file should be defined to hold the module status data. The status data should be copied from the M1 file and placed in the assigned status file. Input (monitor) data should be copied from the user file to the M1 file and output (command) data should be copied from the user files to the M1 file.

3.2   Adding the Module to an Existing Project

1   Double-click **I/O CONFIGURATION** in the *Controller Organization* window.
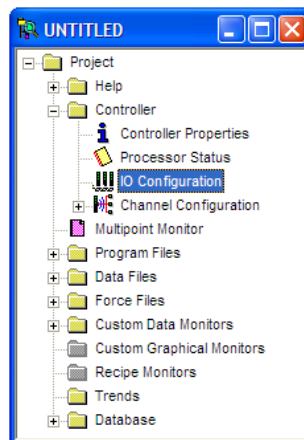
2 This action opens the I/O *Configuration* dialog box. Select an empty slot in the left pane, and then scroll to the bottom of the right pane.
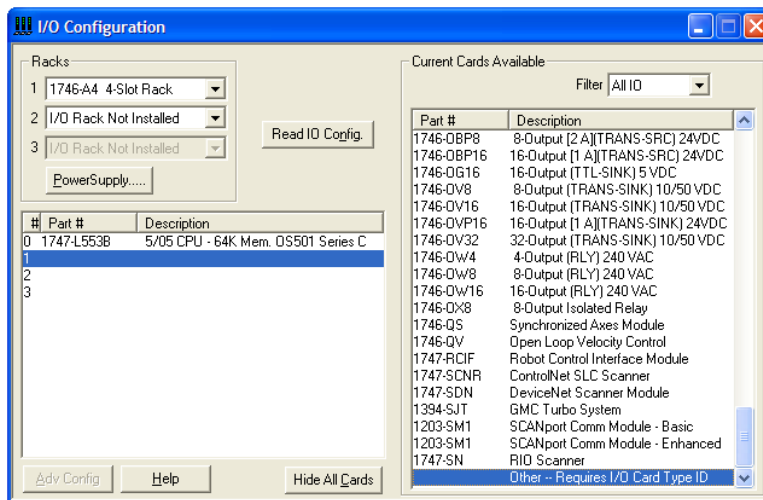
3 In the right pane, double-click **OTHER -- REQUIRES I/O CARD TYPE ID**. This action opens the **"OTHER" TYPE IO CARD** dialog box.
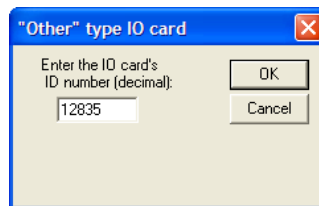
4 The module's I/O card ID number is 12835. Enter that value in the ID number field, and then click **OK** to dismiss the dialog box.
5 Observe that the module you selected is now in the list in the left pane of the *I/O Configuration* dialog box.
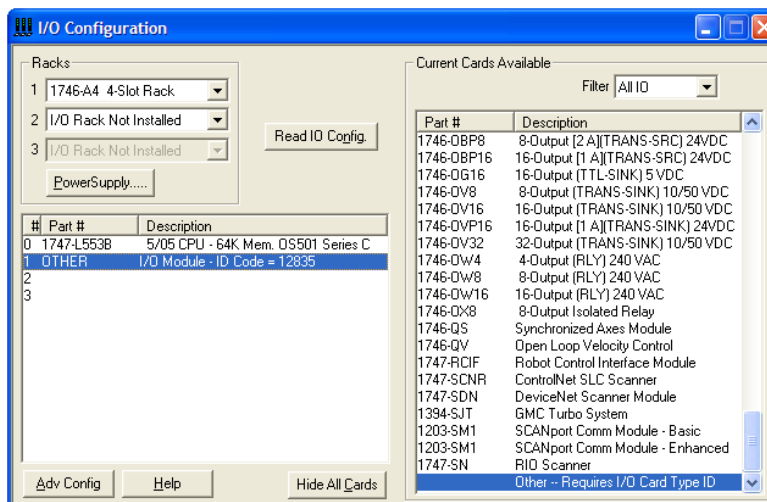
6 Select and double-click the new module in the left pane. This action opens the *Advanced I/O Configuration* dialog box. Fill in the dialog box with the values shown in the following illustration.
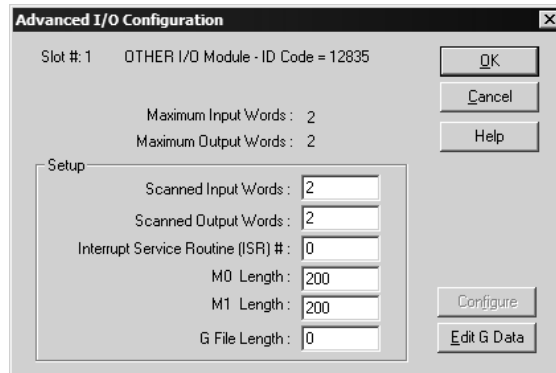
Field	Value
Scanned Input Words	2
Scanned Output Words	2
Interrupt Service Routine (ISR)#	0
M0 Length	200
M1 Length	200
G File Length	0

7 Click OK to save your configuration.
8 Copy the ladder logic and data files from the sample program and paste them into your existing program.

Important: Take care not to overwrite existing data files in your application with data files in the sample application. Rename either the source or the destination data files, and then search and replace references in the ladder for instances of any renamed files.

9 Save and Downloading the Sample Program to the Processor (page 11) the new application to the controller and place the processor in RUN mode.

4 Diagnostics and Troubleshooting

In This Chapter

The module provides information on diagnostics and troubleshooting in the following forms:

- LED status indicators on the front of the module provide general information on the module's status.
- You can view status data contained in the module through the Configuration/Debug port or the Ethernet port, using the troubleshooting and diagnostic capabilities of *ProSoft Configuration Builder (PCB)*.
- You can transfer status data values from the module to processor memory and can monitor them in the processor manually or by customer-created logic. For details on Status Data values, see Error Status Table.

4.1 Reading Status Data from the Module

The MVI46-PDPS module returns a 20-word Status Data block that can be used to determine the module's operating status. This data can be located in the module's database at registers at the location specified in the configuration. This data is transferred to the SLC processor continuously with each read block.

4.1.1 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 Status Register [0] (page 31)
12	Value of Status Status Register [1] (page 33)
13	Module Viewing PROFIBUS Status (page 30)

Byte 10 Data - Specific Product Code Value

- 34 = ASCII "4" = MVI46
- 35 = ASCII "5" = MVI56
- 36 = ASCII "6" = MVI69
- 37 = ASCII "7" = MVI71
- 51 = ASCII "Q" = PTQ

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.

4.1.2 Using ProSoft Configuration Builder (PCB) for Diagnostics

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

1 Start *PCB*, and then right-click the module icon.
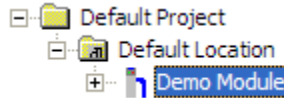
2 On the shortcut menu, choose **DIAGNOSTICS**.
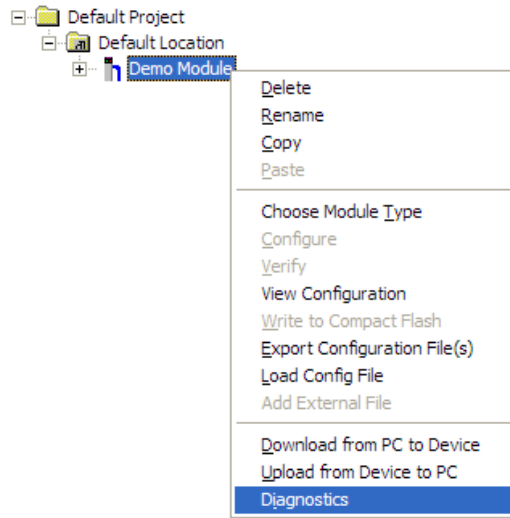
This action opens the *Diagnostics* dialog box.

3 Press **[?]** to open the *Main* menu.
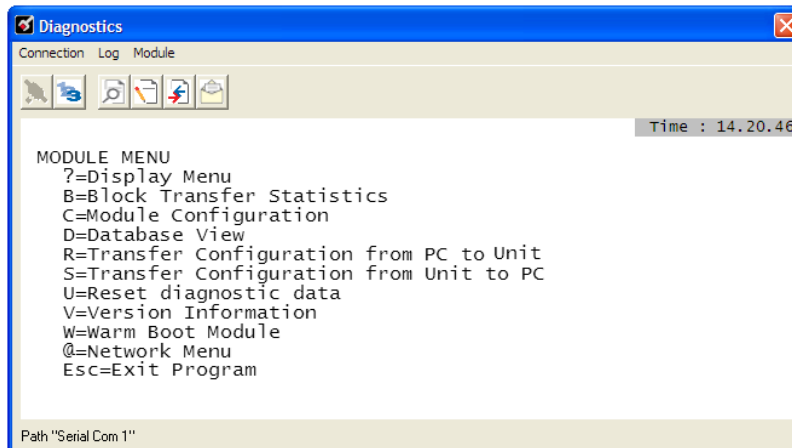
Important: The illustrations of configuration/debug menus in this section are intended as a general guide, and may not exactly match the configuration/debug menus in your own module.

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

1 Click the Setup Connection button to configure the connection. On the *Connection Setup* dialog box, select a valid com port or other connection type supported by the module.
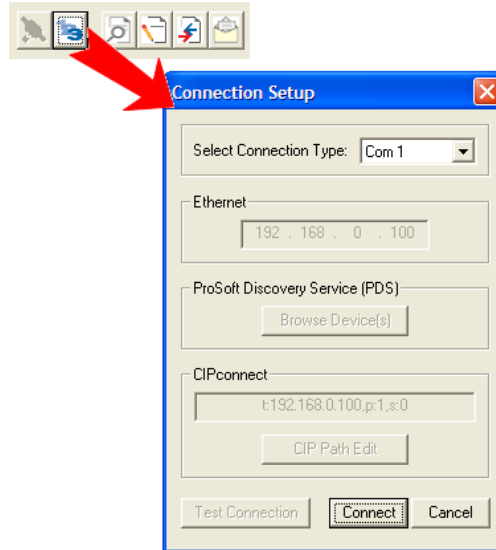
2 For a serial connection, verify that the null modem cable is connected properly between your computer's serial port and the module. A regular serial cable will not work.

3 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 submenus in *ProSoft Configuration Builder* for this module contain commands to redisplay the menu or return to the previous menu. You can always return from a submenu 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:
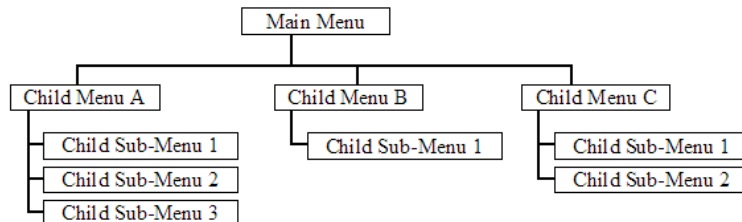
The remainder of this section shows you the menus available for this module, and briefly discusses the available commands.

Keystrokes

The keyboard commands on these menus are usually not case sensitive. You can enter most commands in lowercase or uppercase letters.

The menus use a few special characters (**[?]**, **[-]**, **[+]**, **[@]**) that must be entered exactly as shown. Some of these characters 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]** and **[/]**.

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

4.1.3 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.

```
MVI46-PDPS COMMUNICATION MODULE MENU
  ?=Display Menu
  B=Block Transfer Statistics
  C=Module Configuration
  P=Profibus Slave Menu
  R=Transfer Configuration from PC to MVI Unit
  S=Transfer Configuration from MVI Unit 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. Use these commands only if you fully understand their potential effects, or 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 number 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 module configuration and statistics.

Opening the Input Data View Menu

Press **[I]** to open the Input Data View Menu. Use this command to view the contents of the input database.

Opening the Output Data View Menu

Press **[O]** to open the Output Data View Menu. Use this command to view the contents of the input database.

Viewing Version Information

Press **[V]** to view version information for the module. Use this command to view the current firmware version of the software (Software Revision Level) 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.

Viewing Module Status

Press **[1]** to view status information about the module. This screen also contains useful information for mailbox troubleshooting:

- Scan count
- Mailbox counters
- Alarm counters
- Number of acyclic read and write operations performed by the module

You can also view the number of mailbox messages in the input and output queues, and the number of alarms in the alarm queue.

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. Use these commands only if you fully understand their potential effects, or 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 memory to configure the module.

4.1.4 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
  1=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. A value greater than 0xFF indicates 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 STATUS DATA
  Enable Status Flag    : 1
  Module State          : 4
  Product               : V02.45PDSM
  Status Data (Hex)     : [0]=05 [1]=09
  Diagnostic State (Hex): 01
  Input Counter         : 17200
  Output Counter        : 0
  Last Global Cmd (Hex) : 00
```

Enable State

Indicates the initialized state of the MVI46-PDPS module.

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

Module State

Indicates the current state of the MVI46-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 timer expires, 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 ms or 10 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 ASCI 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 ASCI 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 ASCI 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.

4.2   LED Indicators

Troubleshooting the operation of the PROFIBUS Slave port can be performed using several methods.

The first and quickest is to scan the LEDs on the module to determine the existence and possibly the cause of a problem. This section provides insight into the operation of the PROFIBUS Slave Port status LEDs.

4.2.1   LEDs for the PROFIBUS Slave Port

ACTIVE	ERROR	Description
Flashing	On	PROFIBUS communication problem (not receiving output)
Off	On	Module configured and waiting for first output data set.
Flashing	together	Configuration error during initialization.
Alternate	flashing	Watchdog timer expired.
On	Off	Normal operation.
On	Rapid/irregular flash	Configuration problem from master.
Off	Flashing	User timeout expired.
Off	Off	Module not receiving power or program terminated.

4.2.2 Module Status Indicators

Indicator	Color	Status	Indication
CFG	Green	On	Configuration/Debug Port is active
		Off	Configuration/Debug Port is inactive
APP STATUS	Not used	Always off	
BP ACT	Amber	On	The LED is on when the module is communicating over the backplane. Under normal operation, the LED should blink rapidly on and off.
		Off	The LED is off when the module is unable to communicate with the processor. The processor is either absent or not running.
BATT	Red	Off	The battery voltage is OK and running.
		On	The battery voltage is low or the battery is not present. The battery LED will illuminate briefly upon the first installation of the module or if the unit has not had power for an extended period of time. This behavior is normal, however, should the LED come on in a working installation, please contact ProSoft Technology.
OK	Red / Green	Off	The card is not receiving any power and is not securely plugged into the rack.
		Green	The module has passed its internal diagnostic tests and is functional.
		Red	The module's diagnostics have detected an error, the module is being configured, is not functioning normally, or has not yet been able to initialize backplane communication with the processor."

5   Reference

5.1   Product Specifications

The MVI46 PROFIBUS DP Slave Communication Module allows Rockwell Automation®
SLC compatible processors to interface easily with a PROFIBUS DP Master device.

The PROFIBUS DP slave protocol driver supports the PROFIBUS V0 slave
implementation, providing powerful data transfer capability between the module and SLC
processors. User-configurable data mapping and DP port operation make the interface
an easy-to-use and powerful data transfer tool.

The Configuration/Debug Serial port connects a PC to the module for configuration,
status, monitoring, and troubleshooting (serial cable is included with product shipment).
After editing on a PC, a configuration file is downloaded and stored on the MVI46
module.

The PROFIBUS DP slave gives access to the unit's input and output images with up to
244 bytes of input and output data, for a maximum of 400 bytes total. These input and
output data blocks are mapped by the user within the module's data memory, allowing
maximum flexibility and data transfer with other protocols.

5.1.1 General Specifications

- Single Slot - 1746 backplane compatible (local or extended I/O rack only - remote
  rack not supported)
- The module is recognized as an Input/Output module and has access to processor
  memory for data transfer between processor and module using M0/M1 files
- Ladder Logic is used for data transfer between module and processor. Sample
  ladder file included
- Configuration data obtained from configuration text file downloaded to module.
  Sample configuration file included

5.1.2 Hardware Specifications

Specification	Description
Backplane Current Load	800 ma @ 5V (from backplane)
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Shock	30g operational, 50g non-operational
Relative Humidity	5% to 95% (non-condensing)
Vibration	5 g from 10150 Hz
Processor	Compatible with Rockwell Automation SLC 5/02 M0/M1 capable processors or newer
LED indicators	Module status, Backplane transfer status, Application status, Serial activity and error LED status
Debug/Configuration port (CFG)	
CFG Port (CFG)	RJ45 (DB-9M with supplied cable) RS-232 only
Configuration Connector	RJ45 RS-232 Connector (RJ45 to DB-9 cable shipped with unit)
Application Ports	
Application Serial port (PRT1, PRT2) (Serial Modules)	Two RJ45 RS-232/422/485 Application ports

5.1.3 PROFIBUS Slave Port Specifications

Type	Specifications
General Parameters	
Internal Database	400 registers (200 words) available
GSD File	Downloadable from www.prosoft-technology.com web site
PROFIBUS Slave	
Communication parameters	Baud Rate: 9.6 kbps to 12 Mbps
Supported I/O length	122 words Input data 122 words Output data 200 words combined maximum
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
Physical Connection	
PROFIBUS Connector	Standard PROFIBUS DB-9F communication connector. Cable connection matches PROFIBUS pin out specification.

5.1.4 Functional Specifications - MVI46-PDPS

PROFIBUS Slave

- Communication parameters
    - Baud Rate: 9.6 kbp to 12 Mbps
- Supported I/O length
    - Up to 244 bytes Input data
    - Up to 244 bytes Output data
    - Total not to exceed 400 bytes
- Freeze Mode
- Sync Mode
- Auto Baud Setting
    - Configurable Parameters
    - PROFIBUS Node Address: 0 to 125
    - Data byte swapping
    - Action on loss of PROFIBUS connection
    - Comm Fail Timeout Multiplier
    - Status Data location in Internal Database
- Status Data
    - PROFIBUS Status Data for slave
- Physical Connection
    - PROFIBUS Connector
    - Standard PROFIBUS DB-9F communication connector. Cable connection matches PROFIBUS pin out specification

5.2 Functional Overview

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 PROFIBUS serial communication network.

5.2.1 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 MVI46-PDPS module works as a slave.

PROFIBUS supports a variety of network types. The network type supported by the MVI46-PDPS module is PROFIBUS DP (Device Bus) version 0, which is designed for remote I/O systems, motor control centers, and variable speed drives.
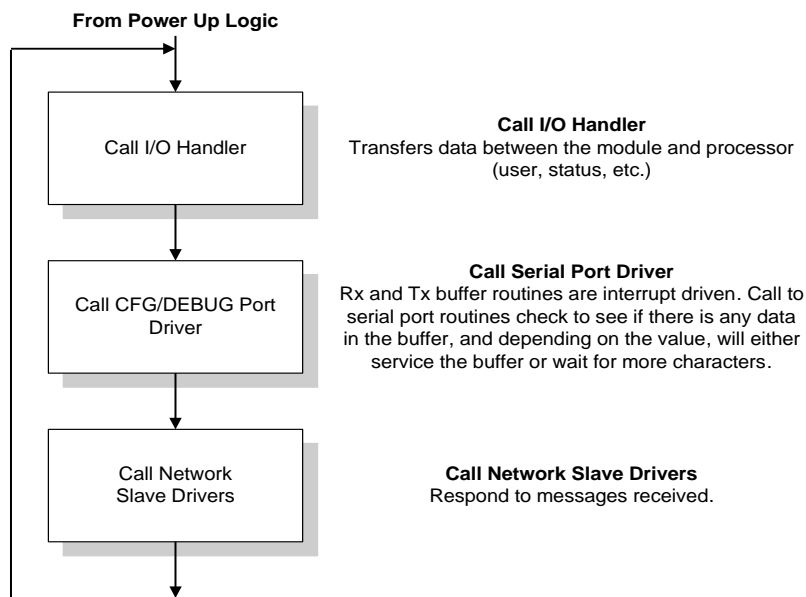
5.2.2 General Concepts

The following topics describe several concepts that are important for understanding the operation of the MVI46-PDPS module.

1   On power up the module begins performing the following logical functions:
2   Initialize hardware components
   o   Initialize SLC backplane driver
   o   Test and Clear all RAM
   o   Initialize the serial communication ports
3   Wait for module configuration from the SLC processor
4   Allocate and initialize Module Register space
5   Enable Slave Driver on selected ports

After the module has received the Module Configuration, the module will begin communicating with other nodes on the network, depending on the configuration.

Main Logic Loop

Upon completing the power up configuration process, the module enters an infinite loop that performs the functions shown in the following diagram.

From Power Up Logic

Call I/O Handler

Call I/O Handler
Transfers data between the module and processor (user, status, etc.)

Call CFG/DEBUG Port Driver

Call Serial Port Driver
Rx and Tx buffer routines are interrupt driven. Call to serial port routines check to see if there is any data in the buffer, and depending on the value, will either service the buffer or wait for more characters.

Call Network Slave Drivers

Call Network Slave Drivers
Respond to messages received.

SLC Processor Not in Run

Whenever the module detects that the processor has gone out of the Run mode (that is, Fault or PGM), backplane communications will halt between processor and module but not on PROFIBUS network. When processor is returned to a running state, the module will resume communication with the processor.

5.2.3 PROFIBUS DP Architecture

The PROFIBUS DP network supports multiple Master systems with several slaves.

The following table shows the most important features of PROFIBUS DP:

Standard	**EIN 501 70** **DIN 19245**
Transmission equipment (Physical)	EIA RS-485 IEC 1158-2 (through link or coupler) Fiber Optic Cable (not available)
Transfer procedure	Half-duplex
Bus topology	Linear bus with active bus termination
Bus cable type	Shielded twisted pair conductors
Connector	9-pin D-Sub
Number of nodes on the bus	Max: 32 with no repeaters Max: 125 with 3 repeaters in 4 segments

NOTE: Use only PROFIBUS connectors with a plastic or a non-conductive shell with this device. Do not use PROFIBUS connectors with a conductive metal shell.

Bus Access

Two different bus access procedures handle the various communication requirements for the PROFIBUS DP topology:

- Token Passing
- Polling

Token Passing

Token passing ring is the basis for communication between the more complex, active stations. All stations have the same rights in that a token is passed from station to station in a logical ring. The token is passed to each station with a maximum, definable token cycle time. A station is given transmission rights for the duration of time that it has the token.

Master/Slave Polling

Master/slave polling guarantees a cyclic, real-time based data exchange between the station with transmission rights, the active station, and its subordinates, the passive stations. In this case, the Master is able to pass data to the slave and/or receive data. The services in layer 2 (field-bus data link in ISO-OSI reference model) organize this communication.

Communication Types

In addition to point-to-point data transfer, the PROFIBUS protocol can also handle the following types of communication.

- Broadcast communication: An active node sends an unacknowledged message to all other nodes (Master and slaves)
- Multicast communication (control instructions): An active node sends an unacknowledged message to a group of nodes (Master and slaves)

Master/Slave Communication Phases

The communication between the Master and the slaves takes place in the following phases:

- Parameterization and configuration phase
- Usable data transfer phase

Before a DP slave can be integrated into the usable data transfer phase, the parameterization and configuration phase runs a device identification test that verifies that the planned configuration matches the actual device configuration for each slave in the PROFIBUS network. The test verifies that:

- The device is actually there
- It is the right type of device
- The station address set on the device matches the station address in the bus configuration
- The formats, telegram length information, and bus parameters are correct
  and
- The number of configured inputs and outputs is correct

5.2.4 Backplane Data Transfer

The MVI46-PDPS module communicates directly over the SLC backplane. All data for the module is contained in the module's M1 file. Data is moved between the module and the SLC processor across the backplane using the module's M-files. The SLC scan rate and the communication load on the module determine the update frequency of the M-files. The COP instruction can be used to move data between user data files and the module's M1 file.

The following illustration shows the data transfer method used to move data between the SLC processor, the MVI46-PDPS module and the PDPS network.
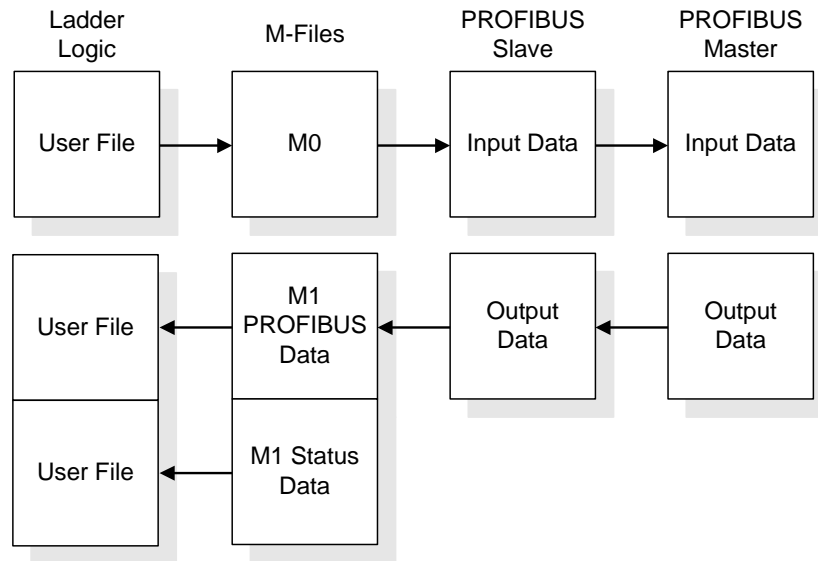
All data transferred between the module and the processor over the backplane is through the M0 and M1 files. Ladder logic must be written in the SLC processor to interface the M-file data with data defined in the user-defined data files in the SLC. All data used by the module is stored in its internal database.

User data contained in this database is continuously read from the M0 file. The configuration data is only updated in the M1 file after each configuration request by the module to the SLC. All data in the M1 file is available to devices on the PROFIBUS DP networks. This permits data to be transferred from these devices to the SLC using the user data area.

Normal Data Transfer

This version of the module provides for direct access to the data in the module. All data related to the module is stored in the module's M1 file. To read data from the module, use the COP instruction to copy data from the module's M1 file to a user data file. To write data to the module, use the COP instruction to copy data from a user file to the module's M0 file.

If the read/write handshake bits are equal, the module owns the M-files. If they are not equal, the SLC owns the M-files. Using this exclusive ownership, data integrity is maintained over the whole PROFIBUS data areas.

Input Data Control

Word	Bit	Definition
0	0	Initialization Request (0=module not active, 1=module ready to run/running)
	1	Initialization Compete (0=module not processed initial data, 1=module processed initial data)
	2	Input read/write handshake bit
	3 to 15	Not used
1	0 to 15	Not used

Output Data Control

Word	Bit	Definition
0	0	Initialization Compete (0=initial data not set, 1=initial data set)
	1	Not used
	2	Output read/write handshake bit
	3 to 15	Not used
1	0 to 15	Not used

Read Block

These blocks of data transfer information from the module to the SLC processor, and transfer output (control) data sent to the module from the remote master unit. The following table describes the structure of the input image.

M1 File

Word	Type	Description
0	PROFIBUS	First word of PROFIBUS data received from master.
…		
121	PROFIBUS	Last potential word to be received from master
122 to 129	Reserved	Reserved for future use
130	Status	Program scan counter
131	Status	Block read counter
132	Status	Block write counter
133	Status	Block parse counter
134	Status	Block error counter
135	Status	PROFIBUS enable state
136	Status	PROFIBUS state
137	Status	PROFIBUS status register[0]
138	Status	PROFIBUS status register[1]
139	Status	Diagnostic state
140	Status	PROFIBUS input counter
141	Status	PROFIBUS output counter
142	Status	Reserved
143	Status	Reserved
144	Status	Reserved
145	Status	Reserved
146	Status	Reserved
147	Status	Reserved
148	Status	Last global command
149 to 199	Reserved	Reserved for future use

The Read Block, in addition to moving user data, the block also contains status data for the module. This last set of data is transferred with each new block of data and can be used for module diagnostics.

Write Block

This block of data transfers data that is coming from the PROFIBUS master to the module and then module passes data to the SLC processor.

The following table describes the structure of the output image.

M0 File

| Word	Type	Description
0	PROFIBUS	First word of PROFIBUS data to be sent to master.
…		
121	PROFIBUS	Last potential word to be sent to master
122 to 199	Reserved	Reserved for future use

PROFIBUS Slave Port

The MVI46 module supports this protocol as a slave module on a PROFIBUS network.

The relationship between the port labeling on the front of the MVI46 module and the application is as follows:

Port Label	Function
PROFIBUS Slave	PROFIBUS Slave Port
Debug	Debug/Configuration
Port 0	Communication Port 0

The following illustration shows the pinout for the PROFIBUS Slave port on the front of the MVI46-PDPS module.

PROFIBUS Slave Port (DB9 Female)
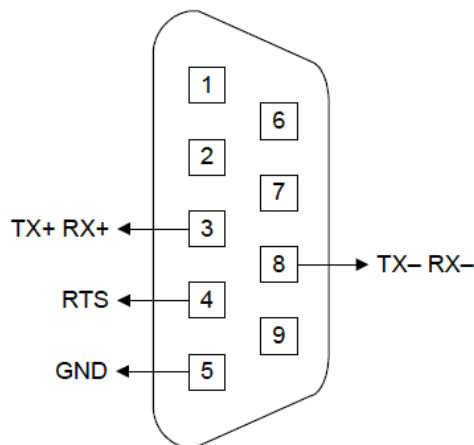
NOTE: Use only PROFIBUS connectors with a plastic or a non-conductive shell with this device. Do not use PROFIBUS connectors with a conductive metal shell.

PROFIBUS Slave Error and Status Data

The PROFIBUS Slave Error and Status Data area is discussed in this section. This information is available in the PDPS status data file, and found in the diagnostic PROFIBUS SLAVE STATUS screen. See Diagnostics and Troubleshooting (page 23) for more information.

The data area is initialized with zeros whenever the module is initialized. This occurs during a cold-start (power-on) or a warm-boot operation. Counter values are also initialized to 0 at power up.

Word	Value	Description
135	Status	PROFIBUS enable state
136	Status	PDPS module state
137	Status	PROFIBUS status register[0]
138	Status	PROFIBUS status register[1]
139	Status	Diagnostic state
140	Status	PROFIBUS input counter
141	Status	PROFIBUS output counter
142	Status	Reserved
143	Status	Reserved
144	Status	Reserved
145	Status	Reserved
146	Status	Reserved
147	Status	Reserved
148	Status	Last global command

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

PROFIBUS Enable State: Word 135

Indicates the initialized state of the PDPS module.

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

MVI46-PDPS Module State - Word 136

Indicates the current state of the MVI46-PDPS module.

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

PROFIBUS Status Register [0]: Word 137

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

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.

PROFIBUS Status Register [1]: Word 138

SPC3 ASIC slave status information provided to the master.

Bits 0 to 3	Baud rate:
	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 4 to 7	SPC3-Release:
	Release no. for SPC3
	0000 = Release 0
	Rest = Not possible

Diagnostic state - Word 139

- 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: Word 140

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

PROFIBUS Output Counter: Word 141

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

PROFIBUS Reserved: Word 142 to Word 147

Reserved for future use.

Last Global Command: Word 148

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

| Bit	Designation	Significance
0	Reserved	
1	Clear_Data	With this command the ASCI 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 ASCI 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 ASCI 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.

## 5.2.5 Disabling the RSLinx Driver for the Com Port on the PC

The communication port driver in *RSLinx* can occasionally prevent other applications from using the PC's COM port. If you are not able to connect to the module's configuration/debug port using *ProSoft Configuration Builder (PCB)*, *HyperTerminal* or another terminal emulator, follow these steps to disable the *RSLinx* driver.

1 Open *RSLinx* and go to **COMMUNICATIONS** > **RSWHO**.
2 Make sure that you are not actively browsing using the driver that you wish to stop. The following shows an actively browsed network.
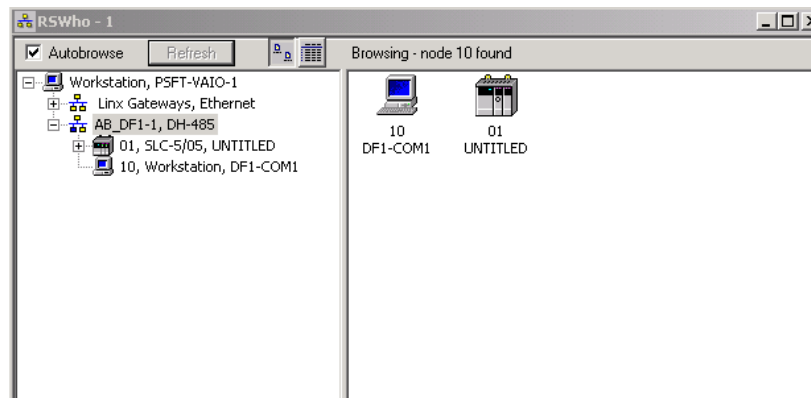
3   Notice how the DF1 driver is opened, and the driver is looking for a processor on node 1. If the network is being browsed, then you will not be able to stop this driver. To stop the driver your *RSWho* screen should look like this:
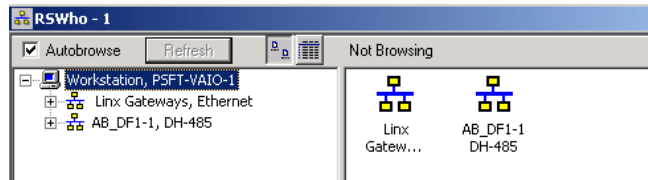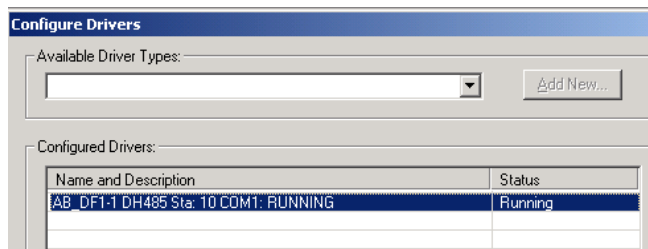

Branches are displayed or hidden by clicking on the ⊞ or the ⊟ icons.
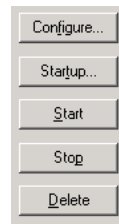

4   When you have verified that the driver is not being browsed, go to **COMMUNICATIONS** > **CONFIGURE DRIVERS**.
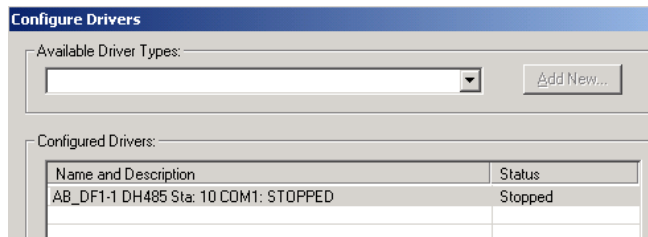
You may see something like this:

If you see the status as running, you will not be able to use this com port for anything other than communication to the processor. To stop the driver press the **STOP** button on the side of the window:

**5**   After you have stopped the driver you will see the following.

6 You may now use the com port to connect to the debug port of the module.

Note: You may need to shut down and restart your PC before it will allow you to stop the driver (usually only on *Windows NT* machines). If you have followed all of the above steps, and it will not stop the driver, then make sure you do not have *RSLogix* open. If *RSLogix* is not open, and you still cannot stop the driver, then reboot your PC.

5.2.6 RS-232 Configuration/Debug Port

This port is physically an RJ45 connection. An RJ45 to DB-9 adapter cable is included with the module. This port permits a PC-based terminal emulation program to view configuration and status data in the module and to control the module. The cable pinout for communications on this port is shown in the following diagram.
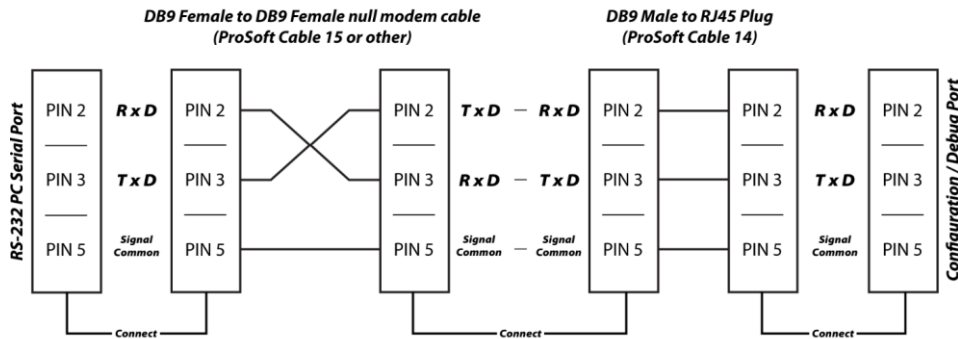
5.2.7 DB9 to RJ45 Adaptor (Cable 14)

Wiring Diagram
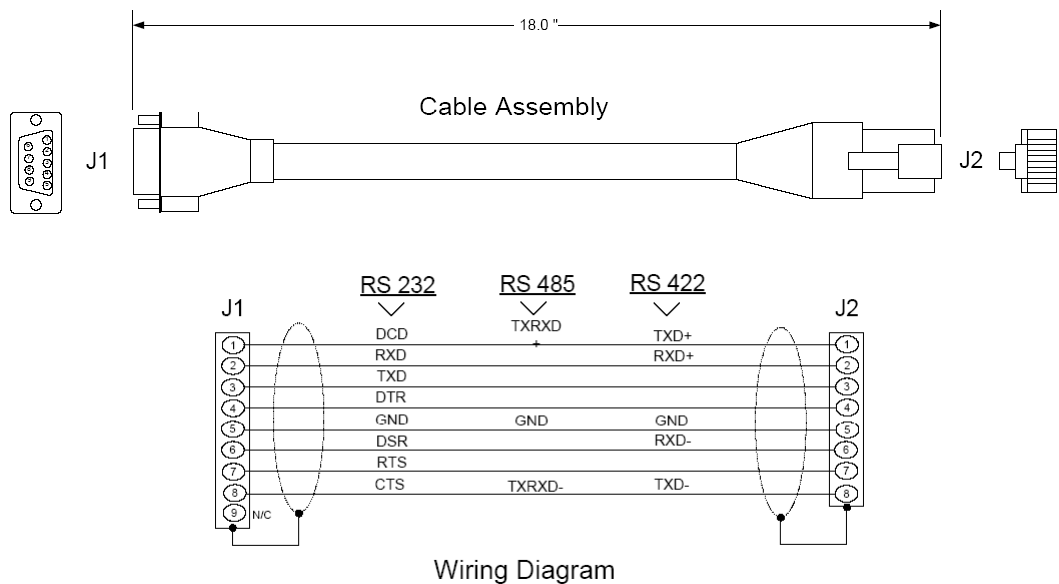
6   Support, Service & Warranty

6.1   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:

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 associated ladder files, if any
2   Module operation and any unusual behavior
3   Configuration/Debug status information
4   LED patterns
5   Details about the interfaced serial, Ethernet or Fieldbus devices

Note: *For technical support calls within the United States, ProSoft's 24/7 after-hours phone support is available for urgent plant-down issues.*

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For additional ProSoft Technology contacts in your area, please visit: https://www.prosoft-technology.com/About-Us/Contact-Us.

6.2   Warranty Information

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www.prosoft-technology/legal