# ProSoft
## TECHNOLOGY

## Where Automation Connects.

## ProLinx®
# RIO

**ProLinx Gateway**

Rockwell Automation® Remote I/O Adapter

February 04, 2010

**DRIVER MANUAL**

## 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

**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

| UL/cUL | ISA 12.12.01 Class I, Div 2 Groups A, B, C, D |
|---|---|
| cUL | C22.2 No. 213-M1987 |



243333                    183151

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

Temp Code T5

II 3 G

Ex nA nL IIC T5 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 Gateways with Ethernet Ports*

Series C ProLinx™ Gateways 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 ProLinx Plus gateway 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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RIO Driver Manual
February 04, 2010

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# Contents

# 1  Protocol Functional Overview

The ProLinx Remote I/O (RIO) Adapter communication interface can be used to interface Rockwell Automation Remote I/O Scanners (PLC, SLC, ControlLogix) to other communication networks. The RIO interface, as the other solutions in the ProLinx family, interface to the other communication networks via the module's internal data table.

## 1.1  Remote I/O Port
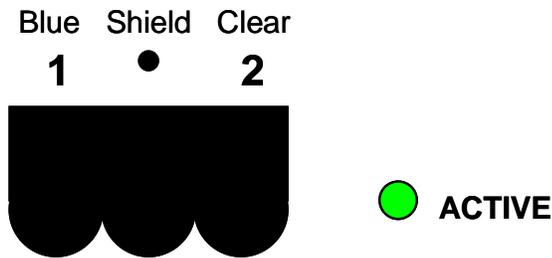


The RIO interface is an adapter (slave) and is connected to a scanner (master) that controls the data transfer.

For example, the master/slave relationship can be accomplished using the 460X-RIO-XXX module (adapter/slave unit) with the Rockwell Automation PLC5 (scanner/master unit). Ladder logic must be programmed into a PLC to perform BTR/BTW commands to receive and transmit data between the module and the PLC. The module also supports limited high speed data transfer via the Input and Output images.

## 1.2  Module Internal Database
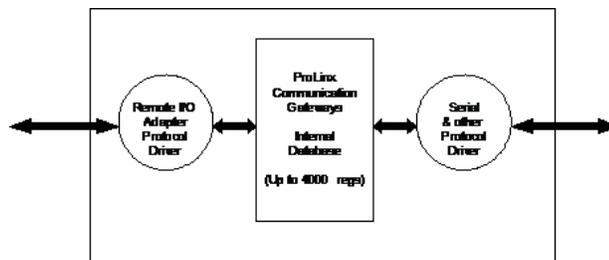
The internal database is central to the functionality of the module. This database is shared between all the ports on the module and is used as a conduit to pass information from one device on one network to one or more devices on another network. This permits data from devices on one communication port to be viewed and controlled by devices on another port.

In addition to data from the slave and master ports, status and error information generated by the module can also be mapped into the internal database.

### 1.2.1  Remote I/O Access to Database

This same internal database is used by the RIO interface to pass information between the module and the RIO scanner.
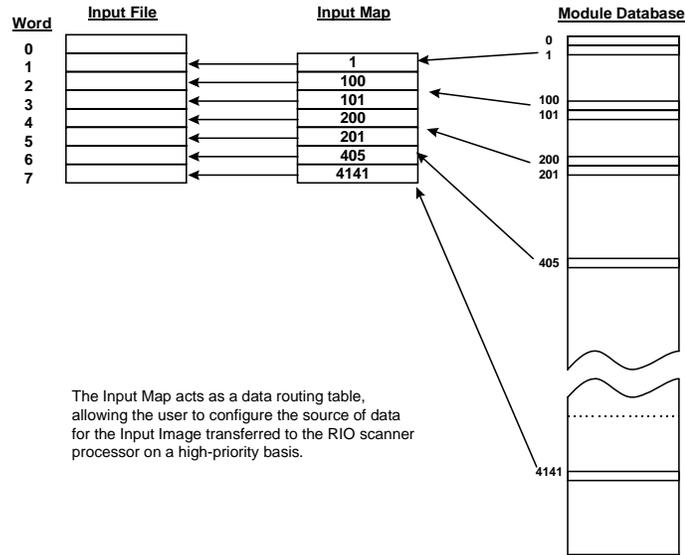
A RIO scanner attached to the module can request data from the module's database using BTR commands. BTW commands  transfer data from the RIO scanning device to the module's database. Each data-block is capable of transferring up to 60-words of data in each block. The module sequentially steps through the list of read and write blocks configured in the module to transfer the data between the module and the RIO scanner. The following illustration shows these relationships:
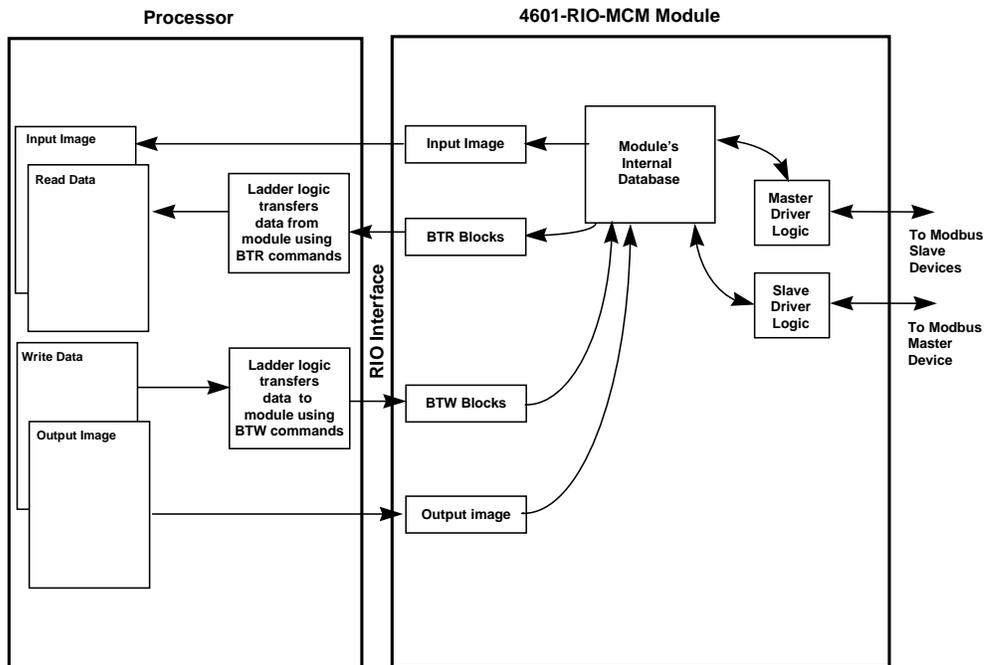


In addition to the block transfer operations, the module reports high-speed data to the RIO scanner through the input and output image table. The size of this table depends on the rack size selected. The following table defines the input/output word count for the different rack size selections:

| Rack Size | Input Word Count | Output Word Count |
| --- | --- | --- |
| 1/4 Rack | 1 | 1 |
| 1/2 Rack | 3 | 3 |
| 3/4 Rack | 5 | 5 |
| Full Rack | 7 | 7 |

The source for the input word(s) and the destination of the output word(s) in the internal database is user configured via the CFG file (See [RIO] section in this manual). Each word is associated with an independent register in the database. The following illustration shows the relationship between the internal database, the input map and processor input image:



The Input Map acts as a data routing table, allowing the user to configure the source of data for the Input Image transferred to the RIO scanner processor on a high-priority basis.

The same relationship exists for the output image except the data is transferred from the PLC to the module's database.

# 2　Protocol Functional Specifications

## 2.1　Remote I/O Specifications

| Type | Specifications |
| --- | --- |
| **Software Configurable Parameters** | |
| Rack Number Addressing | 0 to 63 |
| Rack Size | ¼-rack, ½-rack, ¾-rack and full rack |
| Starting Group | 0,2,4,6 |
| Last Rack | Yes or No |
| Baud Rate | 57.6K, 115K, 230K |
| **Functional Specifications** | |
| | Supports block-transfers of data with scanner |
| | Supports I/O data movement. Amount determined by rack size configuration |
| | BTW Command: 62 words |
| | BTR Command: 63 words |
| **Physical Connection** | |
| Remote I/O connector | Standard 3-screw termination connector. Terminal orientation to allow cable to exit top of connector |

# 3    RIO Protocol Configuration

*In This Chapter*

## 3.1    Install 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 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.

**4**   Save the file to your Windows Desktop, so that you can find it easily when you have finished downloading.

**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 module.

*To install ProSoft Configuration Builder from the Product CD-ROM*

**1**   Insert the ProSoft Solutions Product CD-ROM into the CD-ROM drive of your PC. Wait for the startup screen to appear.

**2**   On the startup screen, click **PRODUCT DOCUMENTATION**. This action opens a Windows Explorer file tree 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 **SETUPCONFIGURATIONTOOL** folder, double-click the "**PCB_*.EXE**" file and follow the instructions on your screen to install the software on your PC. The information represented by the "*" character in the file name is the PCB version number and, therefore, subject to change as new versions of PCB are released.

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.

### 3.1.1 Set Up the Project

To begin, start ProSoft Configuration Builder. If you have used other Windows configuration tools before, you will find the screen layout familiar. ProSoft Configuration Builder's window consists of a tree view on the left, an information pane, and a configuration pane on the right side of the window. When you first start ProSoft Configuration Builder, 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 ProSoft Configuration Builder window with a new project.
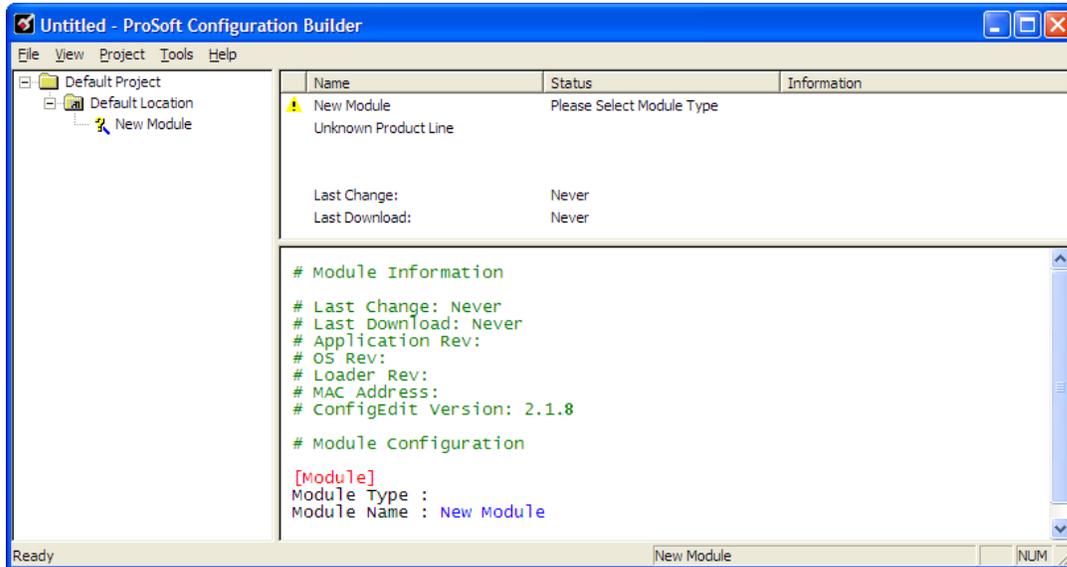
Your first task is to add the RIO module to the project.

**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.
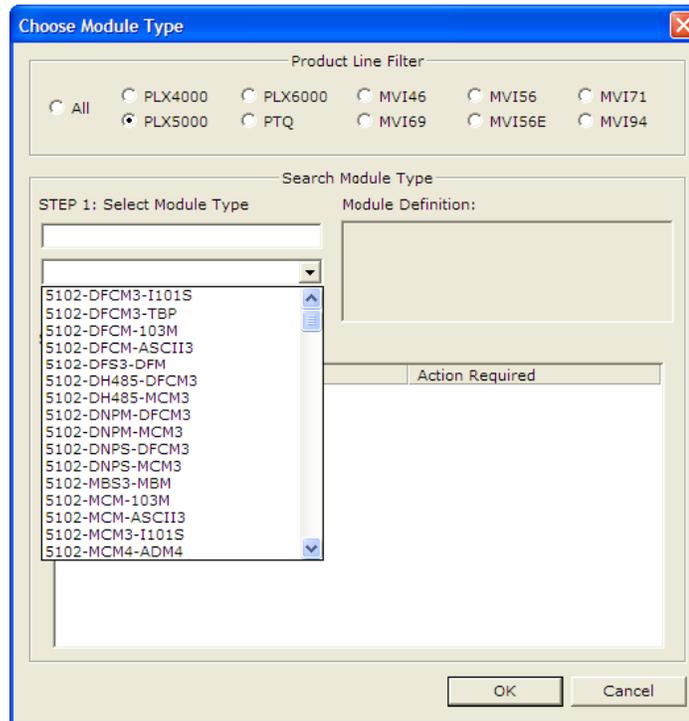


**3** In the **PRODUCT LINE FILTER** area of the dialog box, select **PROLINX.** In the **SELECT MODULE TYPE** dropdown list, select RIO, and then click **OK** to save your settings and return to the **PROSOFT CONFIGURATION BUILDER** window.

The next task is to set the module parameters.

### 3.1.2  To Configure Module Parameters

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

**2** Double-click the 📋 icon to open the **EDIT** dialog box.

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

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

### 3.1.3  To Create Optional Comment Entries

**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.
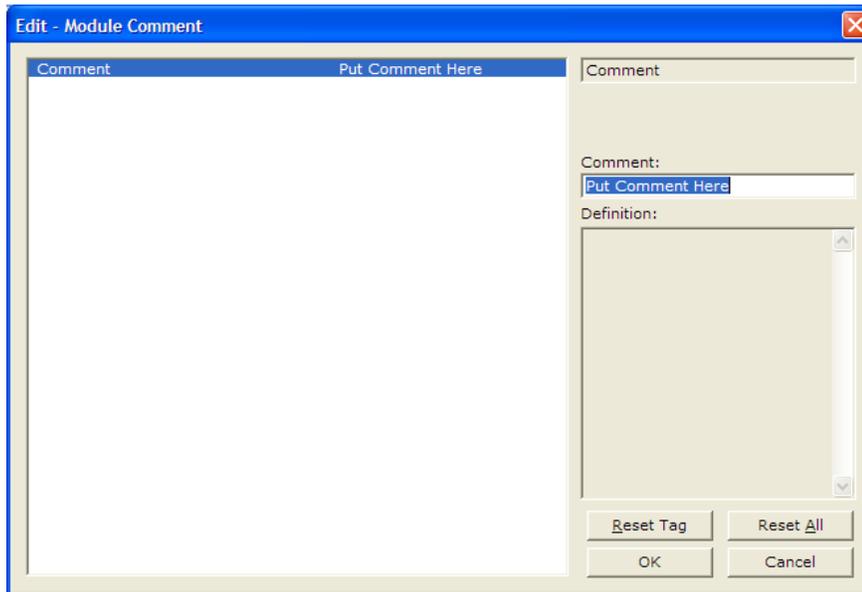


**3**  Enter your comment and click **OK** to save your changes.

### 3.1.4  Printing a Configuration File

**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.**

### 3.1.5 Downloading a File from PC 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.
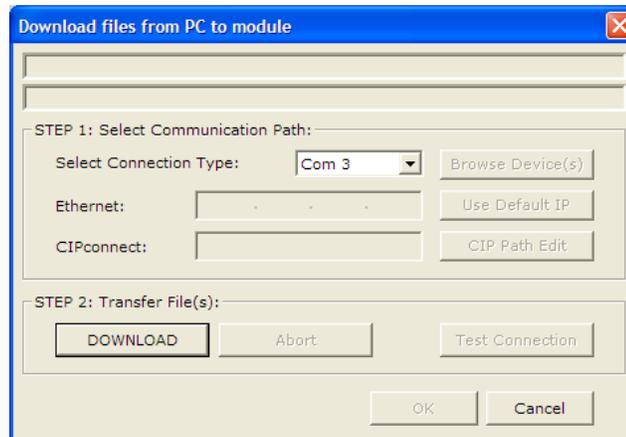
**4** Select the port to use for the download.
**5** Click the **DOWNLOAD** button.

## 3.2 [RIO]

The [RIO] section of the CFG file contains the information used to configure and operate the RIO interface in the ProLinx module.

The amount of data and the placement of the data that is to transfer to/from the module and the scanner is user configured in this section. In addition, this section also contains the communication parameters for the RIO adapter configuration, as well as the Input and Output register map. The Input/Output register map associates the internal database registers with the PLC input and output images.
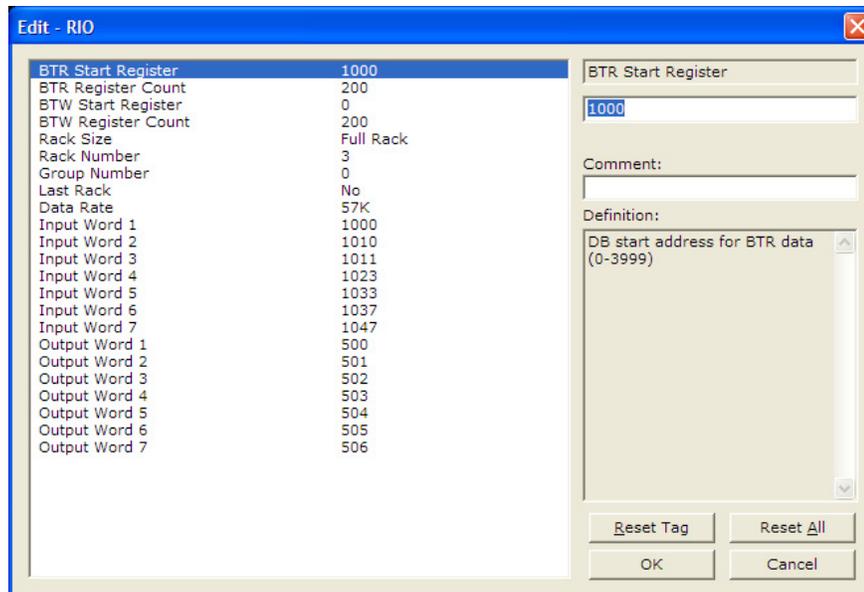


### 3.2.1 BTR Start Register

0 to 3999

This parameter specifies the starting register in the virtual database for the BTR data to be transferred from the module to a processor.

### 3.2.2 BTR Register Count

0 to 4000

This parameter specifies the number of database words to be transferred from the module using the BTR operation. Each block of data transferred from the module to processors can contain up to 60 words of data.

### 3.2.3 BTW Start Register

0 to 3999

This parameter specifies the starting register in the virtual database for the BTW data to be read from processors to the module.

### 3.2.4 BTW Register Count

0 to 4000

This parameter specifies the number of words to be accepted using the BTW operation. Each block received by the module can contain up to 60 words of data.

### 3.2.5 Rack Size

0 to 3

This parameter specifies the rack size that the module is to emulate. The code values entered represent the following rack sizes: 0=1/4 rack, 1=1/2 rack, 2=3/4 rack and 3=full rack. The rack size determines the number of input and output words.

### 3.2.6 Rack Number

0 to 63

This parameter specifies the rack number of the RIO interface. Valid entries are 0 to 63 and the number must be unique on the RIO network.

The following table describes the relationship between the Rack Number parameter in the module (decimal), and the corresponding octal value in the PLC5 processor.

| Prolinx (decimal) | PLC5 (octal) | Prolinx (decimal) | PLC5 (octal) | Prolinx (decimal) | PLC5 (octal) | Prolinx (decimal) | PLC5 (octal) |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 16 | 20 | 32 | 40 | 48 | 60 |
| 1 | 1 | 17 | 21 | 33 | 41 | 49 | 61 |
| 2 | 2 | 18 | 22 | 34 | 42 | 50 | 62 |
| 3 | 3 | 19 | 23 | 35 | 43 | 51 | 63 |
| 4 | 4 | 20 | 24 | 36 | 44 | 52 | 64 |
| 5 | 5 | 21 | 25 | 37 | 45 | 53 | 65 |
| 6 | 6 | 22 | 26 | 38 | 46 | 54 | 66 |
| 7 | 7 | 23 | 27 | 39 | 47 | 55 | 67 |
| 8 | 10 | 24 | 30 | 40 | 50 | 56 | 70 |
| 9 | 11 | 25 | 31 | 41 | 51 | 57 | 71 |
| 10 | 12 | 26 | 32 | 42 | 52 | 58 | 72 |
| 11 | 13 | 27 | 33 | 43 | 53 | 59 | 73 |
| 12 | 14 | 28 | 34 | 44 | 54 | 60 | 74 |
| 13 | 15 | 29 | 35 | 45 | 55 | 61 | 75 |
| 14 | 16 | 30 | 36 | 46 | 56 | 62 | 76 |
| 15 | 17 | 31 | 37 | 47 | 57 | 63 | 77 |

### 3.2.7 Group Number

0,2,4,6

This parameter specifies the group number for the RIO interface. Valid entries are 0, 2, 4 and 6.

### 3.2.8 Last Rack

Yes or No

This parameter specifies if the module is the last rack. A value of Yes signifies the module is the last rack, and a value of No indicates the module is not the last rack.

### 3.2.9 Data Rate

57,115,230

This parameter specifies the data transfer rate to be used on the RIO interface. Valid values for the parameter are as follows: 57 = 57K baud, 115 = 115K baud and 230 = 230K baud. Invalid entries for this parameter will automatically set the data rate to 57K baud.

### 3.2.10 Input Word 1 ... 7

0 to 3999

This parameter specifies the virtual database address to be associated with the input value. The module will constantly update the Input word value with the data stored in the register selected.

### 3.2.11 Output Word 1 ... 7

0 to 3999

This parameter specifies the virtual database address to be associated with the output value. The module will constantly update the database register selected with the data present in the Output Image word.

## 3.3    Remote I/O Adapter Cable Connection
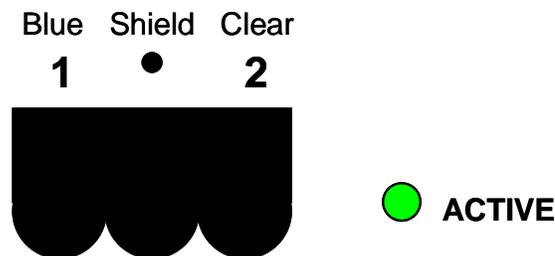


The RIO interface uses the standard Belden 9463 (Blue Hose) cable and is terminated as described in the Rockwell Automation Remote I/O documentation.

No termination resistor is provided on the RIO adapter communication card, therefore any necessary termination resistance must be applied via the screw terminal connector.

# 4    LED Indicators

Troubleshooting the Remote I/O adapter communication modules 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 Remote I/O status LED. The *ProLinx Reference Guide* provide information on the module's other LEDs.

## 4.1    Remote I/O Interface

| LED | Color | Description |
| --- | --- | --- |
| ACTIVE | Off | No communication detected on the Remote I/O link. Verify connection to scanner, power, and use Debug terminal capabilities. |
| | Green Flashing | Remote adapter not actively controlling I/O (Scanner to adapter communication link is normal). Verify if the processor is in program, or duplicate node address on network. |
| | Green Solid | Normal indication. Remote I/O adapter is operational. Check base module APPERR led to be sure |

# 5    Remote I/O Adapter Status and Error Data

The second and most thorough troubleshooting method is the powerful Debug port on the module which provides much more complete access to the internal operation and status of the module. Accessing the Debug capabilities of the module is accomplished easily by connecting a PC to the Debug port and loading a terminal program such as ProSoft Configuration Builder or HyperTerminal.

The following topics list the register addresses that contain error and status data. Use the Database View option from the ProLinx Main Menu to view the contents of each register. The *ProLinx Reference Guide* provides information on using this option.

The module uses internal database addresses from 9000 through 9013. Addresses 9014 through 9099 contain no valid data.

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).

| Example Internal Database Address | Word Offset | Description |
|---|---|---|
| 9000 | 0 | Output/Reset Command Count (1|7) |
| 9001 | 1 | Output Command Count |
| 9002 | 2 | BTW Received Count |
| 9003 | 3 | Communication Failure Count |
| 9004 | 4 | BTW Processed Block Count |
| 9005 | 5 | BTW Parsed Block Count |
| 9006 | 6 | BTW Command Control Count |
| 9007 | 7 | BTW Bad Block Number Count |
| 9008 | 8 | BTW Bad Data Size Count |
| 9009 | 9 | BTR Block Built Count |
| 9010 | 10 | BTR Request Block Count |
| 9011 | 11 | Read Image Update Count |
| 9012 | 12 | Current RIO Error Code |
| 9013 | 13 | Last RIO Error Code |
| 9014 | 14 | No Valid Data |
| --- | | |
| 9099 | | |

Note: The example addresses shown above assumes RIO Port. Note that each active serial port will have one of these Error Status data blocks available in the internal database.

Refer to the Error Codes to interpret the status/error codes present in the data area (page 24).

## 5.1 Remote I/O Adapter Error Codes

The list of potential error codes reported in the RIO communication status block are listed below:

| Code | Description |
| --- | --- |
| 0 | Normal Operation |
| 1 | Remote I/O cable disconnected |
| 2 | Remote I/O disconnected, rack inhibited |
| 3 | PLC faulted or not in run mode, rack reset |

# 6    Ladder Programming for RIO Module

*In This Chapter*

In order to communicate with the RIO interface on a ProLinx module, the Remote I/O Scanner (usually a PLC) must be set up and programmed to scan the interface. The example given in this document is for the Rockwell Automation PLC5 processor. Other examples may be available on the ProSoft Technology web site at www.prosoft-technology.com. Refer to this site for the latest information on this and other ProLinx products.

## 6.1    Initial Setup

This section discusses the initial configuration parameters that must be set to interface with the RIO communication module on the PLC5. Parameters set in this configuration must match those set in the ProLinx module.

The first parameter that must be defined for the module is the rack size. This parameter determines the number of words in the input and output images. These words will appear in the I1: and O0: files on the PLC. Use the RSLogix 5 software to configure the 1B channel on the PLC as displayed below:
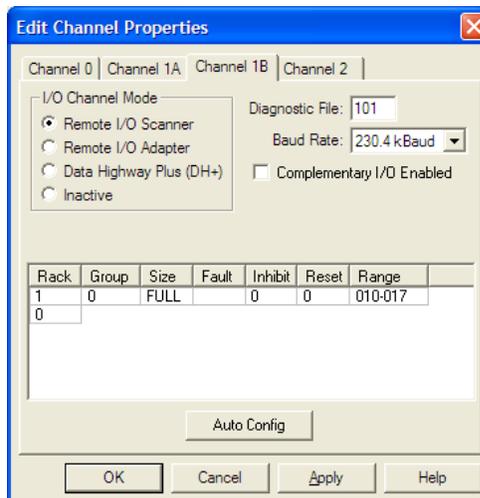
This example setup defines the module to be a full rack (8-input words and 8-output words) at rack address 1, group 0. You must define the configuration and I/O status files when installing and configuring the module. The configuration file is defined in the field shown in the display above (Diagnostic File: 101 in the example). The RSLogix software will automatically generate this file. The I/O status file is defined in the controller setup dialog box displayed below (I/O Status S:16 = 99):
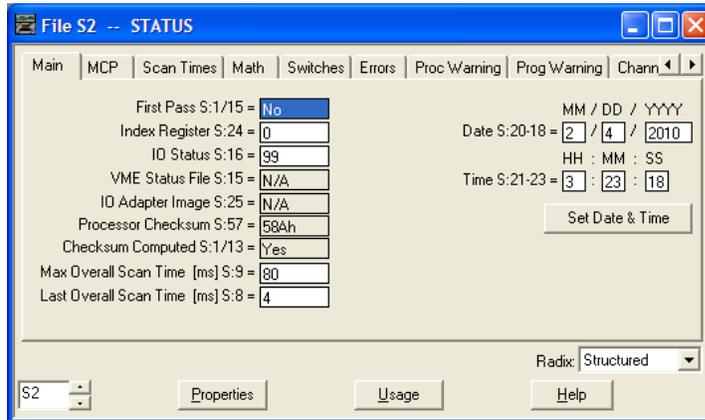


## 6.2    Input and Output Data Images

Data in the input and output images is automatically transferred between the module and the PLC. Therefore, no ladder logic is required to interface with this data. The input and output map information in the ProLinx module's configuration file (RIOMCM.CFG) defines the source and destination of this data. Each word in the I/O image is assigned by the user to be associated with a register in the module's virtual database.

Using the configuration defined above, the input image data will be stored in the PLC data table I1:010 to I1:017. Data in the table is sourced from the module and placed in the data table by the RIO driver. An example of the file is shown below:
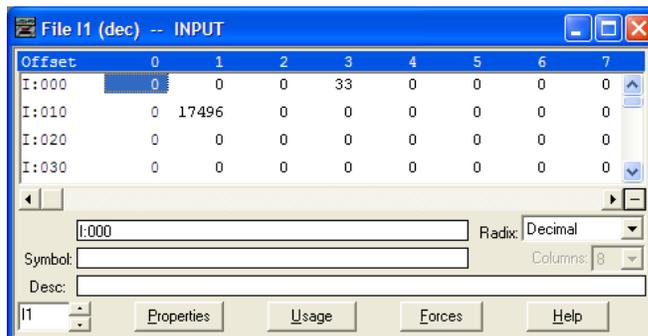
The output image for the example is stored in data table O0:010 to O0:017. Data in this table is set in the ladder logic and used for the control of devices attached to the ProLinx communication module. An example of the file is shown below:
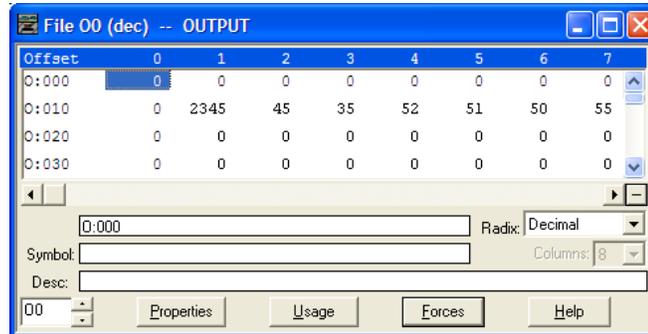


## 6.3    Ladder Logic Programming

After this initial configuration is performed, it is now time to build the ladder logic. It is highly recommended that the ladder logic provided by ProLinx be used as a starting point to make certain the module communicates. Additionally, it provides a base from which to expand. If you deviate from the ladder logic provided, it will be difficult for technical support to provide an expedient answer to your problem.

The ladder logic is defined in two rungs: a BTR rung to transfer data from the module to the processor and a BTW rung to transfer data from the processor to the module. Each rung is discussed below.

### 6.3.1  BTR Ladder Rung

The BTR rung transfers data from the module to the PLC. Data is loaded into the data block by the module in a fixed format. The block contains a header and a data section as defined below:

| Word # | Description |
|--------|-------------|
| 0 | BTR block identification code to indicate data set being transferred in the data block. |
| 1 | BTW block identification code of block the module wishes to receive from the PLC. This word is copied to the BTW block by the ladder logic. |
| 2 | This word specifies the number of valid data values in the block. The range of values contained in this field is from 0 to 60. |
| 3 to 62 | These words in the block contain the data being transferred from the module to the PLC. |

The first word of the header defines the block number being transferred from the module to the PLC. This block code identifies the data set transferred in the block. Block numbers less than 0 are used if the module is transferring less than two blocks of data. If the module transfers only blocks -1 and -2, the module is configured for no read data transfers. If the module transfers blocks -1 and 0, the module is configured for one data block (1 to 60 words of data) and only the data in block 0 is valid. The data set transferred is identified by the block as follows:

```
Data Start Address = Block ID * 60
```

Therefore, the first word of data received in block 0 should be stored at data word offset 0. The first word of data received in block 1 should be stored at data word offset 60.

The next word in the header represents the BTW block identification code the module is requesting from the PLC. The BTW logic should handle all blocks requested by the module. This word should be copied to the first word of the BTW block to be transferred next. Refer to the BTW Rung section below for a discussion of how this word should be handled in the logic.

The last word of header information defines the number of valid words of data in the block. The simplest way to handle the ladder logic is to configure the data read area to be an even multiple of 60 words. This prevents the ladder logic from having to handle short block messages. The BTR operations that interface with the RIO module always transfer the same block sizes, therefore, there is no optimization by setting the data area to a smaller size. In fact, the added code in the ladder logic may slow the data transfer operation.

The data area follows the header section.This is the portion of the data block that must be transferred to the user defined data table. The user is responsible for setting up data tables and ladder logic to handle the BTR blocks. An example of ladder logic to process four BTR blocks is displayed below:
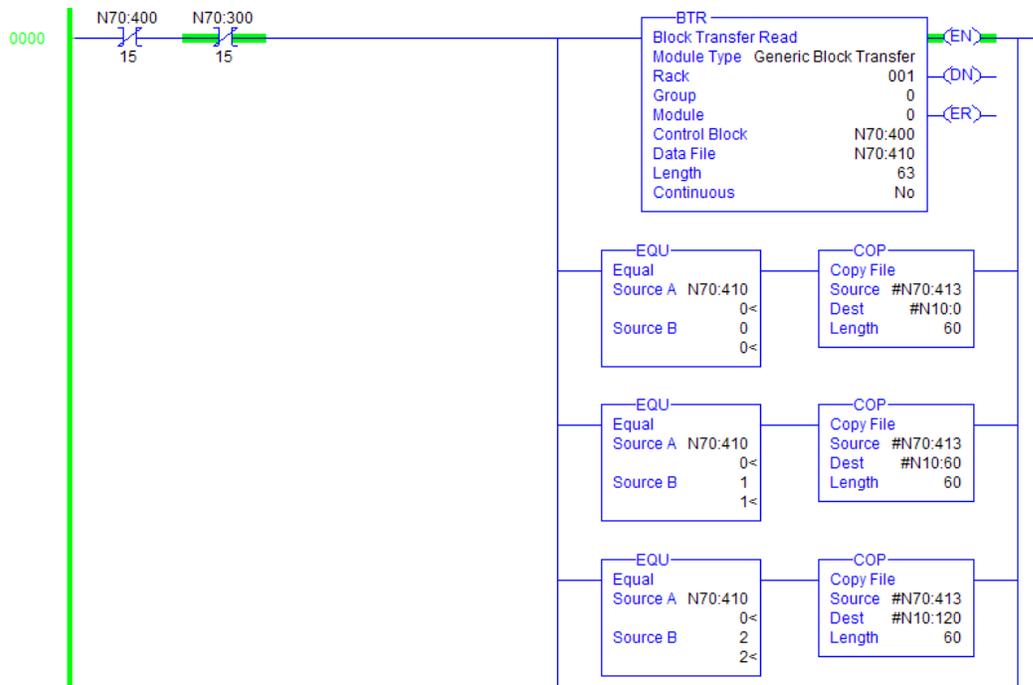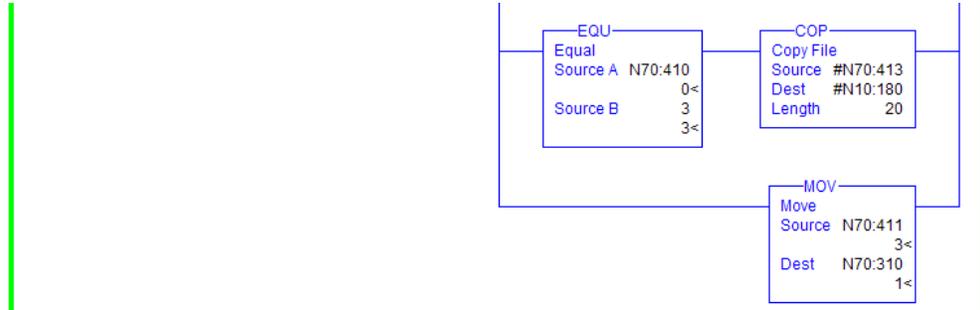
## 6.3.2  BTW Ladder Rung

The BTW rung transfers data from the PLC to the ProLinx communication module. Data is loaded into the data block by the user defined ladder logic in the PLC. The block contains a header and a data section as defined below:

| Word # | Description |
|---|---|
| 0 | BTW block identification code to indicate data set being transferred in the data block. |
| 1 | This word specifies the number of valid data values in the block. The range of values contained in this field is from 0 to 60. |
| 2 to 61 | These words in the block contain the data being transferred from the PLC to the module. |

The first word of the header defines the block number being transferred from the PLC to the module. This block code identifies the data set transferred in the block.

This block number is normally copied from the BTW identification code field in the BTR block received by the PLC. Block numbers less than 0 are used if the module is requesting less than two blocks of data. If the module transfers only blocks -1 and -2, the module is configured for no write data transfers. If the module transfers blocks -1 and 0, the module is configured for one data block (1 to 60 words of data) and only the data in block 0 is valid. The data set transferred is identified by the block as follows:

```
Data Start Address = Block ID * 60
```

Therefore, the first word of data received in block 0 will be stored at the BTW Start Register address specified in the user configuration of the module. The first word of data received in block 1 will be stored at data word offset 60 from the BTW Start Register parameter in the module.

The last word of header information defines the number of valid words of data in the block. The simplest way to handle the ladder logic is to configure the data write area to be an even multiple of 60 words. This prevents the ladder logic from having to handle short block messages. The BTW operations that interface with the RIO module always transfer the same block sizes, therefore, there is no optimization by setting the data area to a smaller size. In fact, the added code in the ladder logic may slow the data transfer operation.

The data area follows the header section. This portion of the data block is filled in by the user ladder logic in the PLC. This information is transferred from the PLC and placed in the RIO communication module's database. An example of ladder logic to process four BTW blocks is displayed below:
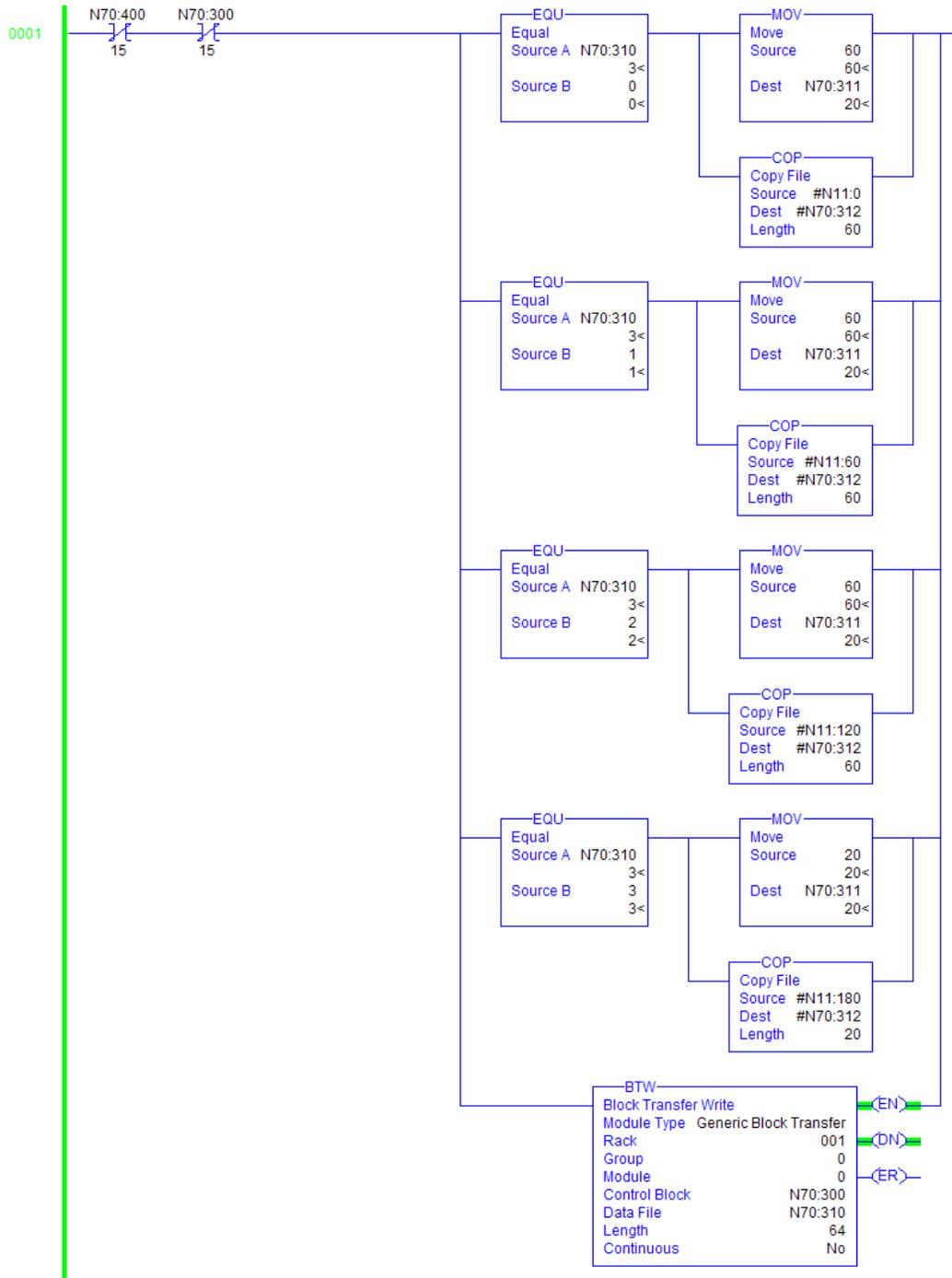
# 7 Support, Service & Warranty

## 7.1 How to Contact Us: Technical Support

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 associated ladder files, if any
2 Module Operation
   o Configuration/Debug status information
   o LED patterns
3 Details about the serial, Ethernet or fieldbus devices interfaced with, if any.

Note: *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.*

| | |
|---|---|
| **Internet** | Web Site: www.prosoft-technology.com/support<br>E-mail address: support@prosoft-technology.com |
| **Asia Pacific**<br>(location in Malaysia) | Tel: +603.7724.2080, E-mail: asiapc@prosoft-technology.com<br>Languages spoken include: Chinese, English |
| **Asia Pacific**<br>(location in China) | Tel: +86.21.5187.7337 x888, E-mail: asiapc@prosoft-technology.com<br>Languages spoken include: Chinese, English |
| **Europe**<br>(location in Toulouse, France) | Tel: +33 (0) 5.34.36.87.20,<br>E-mail: support.EMEA@prosoft-technology.com<br>Languages spoken include: French, English |
| **Europe**<br>(location in Dubai, UAE) | Tel: +971-4-214-6911,<br>E-mail: mea@prosoft-technology.com<br>Languages spoken include: English, Hindi |

| North America (location in California) | Tel: +1.661.716.5100, <br> E-mail: support@prosoft-technology.com <br> Languages spoken include: English, Spanish |
| --- | --- |
| Latin America (Oficina Regional) | Tel: +1-281-2989109, <br> E-Mail: latinam@prosoft-technology.com <br> Languages spoken include: Spanish, English |
| Latin America (location in Puebla, Mexico) | Tel: +52-222-3-99-6565, <br> E-mail: soporte@prosoft-technology.com <br> Languages spoken include: Spanish |
| Brasil (location in Sao Paulo) | Tel: +55-11-5083-3776, <br> E-mail: brasil@prosoft-technology.com <br> Languages spoken include: Portuguese, English |

## 7.2 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 (page 34). In the event of any inconsistency between the RMA Policies and the Warranty, the Warranty shall govern.

### 7.2.1 All Product Returns:

a) In order to return a Product for repair, exchange or otherwise, the Customer must obtain a Return 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 31). 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. Returns for credit require that all accessory parts included in the original box (i.e.; antennas, cables) be returned. Failure to return these items will result in a deduction from the total credit due for each missing item.

### *7.2.2 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

   i. If a defect is found and is determined to be customer generated, or if the defect is otherwise not covered by ProSoft's warranty, there will be no credit given. Customer will be contacted and can request module be returned at their expense;

   ii. If defect is customer generated and is repairable, customer can authorize ProSoft repair the unit by providing a purchase order for 30% of the current list price plus freight charges, duties and taxes as applicable.

### *7.2.3 Procedures for Return of Units Out of Warranty:*

a) Customer sends unit in for evaluation to location specified by ProSoft, freight prepaid.

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:**

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

## 7.3     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.

### 7.3.1  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 (3) years from the date of shipment for Product purchased **on or after** January 1st, 2008, or one (1) year from the date of shipment for Product purchased **before** January 1st, 2008 (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 from date of original shipment. 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 remanufactured replacement parts. ProSoft reserves the right, and at its sole discretion, may replace unrepairable units with new or remanufactured equipment. All replacement units will be covered under warranty for the 3 year period commencing from the date of original equipment purchase, not the date of shipment of the replacement unit. 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 warranteed 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.

### 7.3.2  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.

### 7.3.3  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.

### 7.3.4 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.

### 7.3.5 Disclaimer of all Other Warranties

The Warranty set forth in What Is Covered By This Warranty (page 34) 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.

### 7.3.6 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 include, 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.

### 7.3.7 Time Limit for Bringing Suit

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

### 7.3.8 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.

### 7.3.9 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.

### 7.3.10 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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