ICDM-RX/PN1

PROFINET IO to Modbus

Manual







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1 Introduction

1.1 Installation Overview



Use the *ICDM-RX Hardware Installation and Configuration Manual* found at **www.pepperl-fuchs.com** to do the following:

- 1. Install the hardware.
- 2. Configure the IP address.
- 3. If necessary, upload the latest firmware.
- 4. Attach the serial device.

This *User Guide* is organized to reflect the installation order after you have used installed the hardware and done basic network configuration (assign IP address).

- 1. Configure the serial device or devices.
- 2. Configure the Modbus device.
- 3. Configure the ICDM-RX/PN1 in TIA Portal.

In addition, this User Guide also provides the following information:

- IO data handling
- Provides an example project
- Discusses advanced functions
- Provides information about the Network, Data Mapping, Diagnostics, and System web pages

1.2 Supported Models



H

This *User Guide* supports the ICDM-RX/PN1 Industrial Gateway, which includes the following products:

- ICDM-RX/PN1-DB9/RJ45-PM
- ICDM-RX/PN1-DB9/RJ45-DIN
- ICDM-RX/PN1-ST/RJ45-DIN
- ICDM-RX/PN1-2DB9/RJ45-DIN
- ICDM-RX/PN1-2ST/RJ45-DIN
- ICDM-RX/PN1-4DB9/2RJ45-DIN

Note

Industrial Gateway products are typically referred to as ICDM-RX/PN1 in this User Manual unless there is product specific information.

1.3 Software and Documentation

You can access the appropriate firmware assembly, PortVision DX, and the *ICDM-RX Hardware Installation and Configuration Manual* from: https://www.pepperl-fuchs.com.



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Configuring a Serial Port

Use the following procedure to configure the serial ports.

- 1. Open the ICDM-RX/PN web interface using your browser. The default IP address is 192.168.250.250. You can use PortVision DX to program your IP address, if necessary.
- 2. Click Serial and the Serial Port Overview page displays.

PepperliFuchs				
Port 1 Port 2 Port 3 Port 4				
erial Port Overview				
his is the current configuration of the serial	port(s). Select a serial port	from the menu above to c	hange the configuration.	
Serial Port Settings	Port 1	Port 2	Port 3	Port 4
Port Name:				
Port Mode:	RS-232	RS-232	RS-232	RS-232
Baud Rate:	38400	38400	38400	38400
Parity:	none	none	none	none
Data Bits:	8	8	8	8
Stop Bits:	1	1	1	1
Flow Control:	none	none	none	none
RS-485 Terminating Resistor:	off	off	off	off
DTR Mode:	off	off	off	off
Rx Timeout Between Packets (ms):	200	200	200	200
Discard Messages With Errors:	yes	yes	yes	yes
Serial Port Protocol:	Modbus/RTU-to-Slaves	Modbus/RTU-to-Slaves	Modbus/RTU-to-Slaves	Modbus/RTU-to-Slaves
Modbus To-Slaves Settings				
Response Timeout (ms):	1000	1000	1000	1000
Inactivity Wait Time Before Tx (ms):	0	0	0	0
Lost Device Search Enable:	no	no	no	no
Send Write Messages First:	no	no	no	no
Disable Writes (Read Only):	no	no	no	no
Device ID Offset Mode:	Off	Off	Off	Off
Device ID Offset:	0	0	0	0
Valid Rcvd Msg Device ID Range:	1-255	1-255	1-255	1-255
Valid On Port Device ID Range:	1-255	1-255	1-255	1-255
Modbus To-Master Interface Settings				
Discard Modbus Error Responses:	N/A	N/A	N/A	N/A
Modbus Master/Slaves Settings (Maste	r with Private Slaves)			
Forward Broadcasts From Master:	N/A	N/A	N/A	N/A
Private Slave Device ID Range:	N/A	N/A	N/A	N/A

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3. Click the port number that you want to configure and the corresponding port page displays.

rt 1 Serial Configuration	
erial Configuration	Modbus Settings
ort Name: ort Mode: aud Rate: aud Rate: arity: arity: none \checkmark ata Bits: top Bits: low Control: S-485 Terminating Resistor: TR Mode: x Timeout Between Packets (ms): 200 iscard Rx Pkts With Errors:	Serial Port Protocol: Modbus/RTU-to-Slaves Modbus To-Slaves Settings Response Timeout (ms): 1000 Lost Device Search Enable:
	Private Slave Device ID Range: min: 1 max: 1

- 4. Configure the serial port to match the serial device that you plan on attaching to that serial port and click **Save** when you are done. Refer to the following tables if you need information about the options on the **Port Configuration** page.
 - Serial Port Configuration Serial Device Options (below)
 - Serial Port Configuration Modbus Settings on page 11

Serial Port Configuration - Serial Configuration			
Port Name	A user definable string used to describe the serial interface. Valid characters include a-z, A-Z, 0-9, underscores, spaces and dashes. All other characters are discarded. Up to 80 character ASCII string. The default is blank.		
Port Mode	Select the communications mode for the serial device that you are connecting to the port. The available modes are RS-232, RS-422, and RS-485.		
Baud Rate	Select a baud rate from the list. The baud rate that you select determines how fast information is transferred through a port.		
Parity	 Select a method for error checking. None - When the parity is set to none, there is no parity bit, and ICDM-RX/PN does not perform parity checking. Odd - Indicates that the sum of all the 1-bits in the byte plus the parity bit must be odd. When the total is odd, the parity bit is set to zero, when it is even, the parity bit is set to one. Even - When the sum of all the 1-bits is even, the parity bit must be set to zero; when it is odd, the parity bit must be set to one. 		
Data Bits	Select the number of bits that make up the data. Choose from 5, 6, 7 or 8- bits.		
Stop Bits	Select the number of bits to mark the end of data transmission.		

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Serial Port Confi	guration - Serial Configuration (Continued)
Flow Control	 Specifies the ability to start and stop the flow of data without the loss of bytes. Select a method for controlling the flow of data from the following list: None - Indicates flow control is not in affect. RTS/CTS - Request To Send (RTS) tells the receiving device that the sending device has data that is ready to send and Clear To Send (CTS) indicates the device is ready to accept data. XON/XOFF - When selected, applies the standard method of controlling data flow between two modems. Half Duplex - Transmits data in half-duplex mode.
RS-485 Terminator Resistor	 This option displays on supported models. Select the state of the terminator resistor in RS-485 mode. The terminator resistor is available on the DIN rail models. on - Enable RS-485 Terminator Resistor off - Disable RS-485 Terminator Resistor
DTR Mode	 Select the state of Data Terminal Ready (DTR). on - Enables DTR. off - Disables DTR.
Rx Timeout Between Packets	 Specifies the following information, once the start of a packet is received: How long the ICDM-RX/PN should wait (in milliseconds) before timingout, if the ETX Rx Detect length is one byte or two bytes and the ETX byte(s) are not received. The time to wait in milliseconds between serial packets if the ETX Rx Detect length is set to none.
Discard Rx Pkts With Errors	By default, this box is checked and the ICDM-RX/PN discards serial packets with errors. Clear the check box when you need to receive a serial packet with errors to troubleshoot an issue.

Serial Port Configuration - Modbus Settings				
Serial Port Protocol	 The Modbus protocol, setting for this serial port: Modbus/RTU-to-Slaves – Configures the serial port to communicate to Modbus/RTU slaves. Modbus/ASCII-to-Slaves – Configures the serial port to communicate to Modbus/ASCII slaves. Modbus/RTU-to-Master – Configures the serial port to communicate to a Modbus/RTU master. Modbus/ASCII-to-Master – Configures the serial port to communicate to a Modbus/ASCII master. Modbus/RTU-to-Master/Slaves – Configures the serial port to communicate to a Modbus/RTU-to-Master/Slaves – Configures the serial port to communicate to a serial bus with a Modbus/RTU master and Modbus/RTU slave(s). Modbus/ASCII-to-Master/Slaves – Configures the serial port to communicate to a serial bus with a Modbus/ASCII master and Modbus/ASCII slaves. 			
Modbus To-Slaves	s Settings			
Response Timeout (Default = 750 msec)	The maximum allowable time (0 to 65535 msec.) for a slave device to respond to a message before the message is considered timed out.			
Lost Device Search Enable Not supported: 1- port (Default = Off)	If selected, lost devices that were on this port are searched for on other Modbus/RTU and Modbus/ASCII slave ports that also have this option set.			

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Serial Port Confi	guration - Modbus Settings (Continued)			
Inactivity Wait Time Before Tx (ms) (Default = 0 ms)	The minimum time (0 to 65535 msec.) that the ICDM/RX-PN1 waits after receiving a response or transmitting a Modbus request before transmitting the next request.			
Send Write Messages First (Default = Off)	If selected, it transmits any write messages before transmitting any read messages that may have already been queued for transmission.			
Disable Writes (Read Only) (Default = Off)	If selected, it disables transmission of all standard Modbus write messages.			
Device ID Offset Mode (Default = Off)	 Off disables Device ID Offset functionality. Add-to-Msg-ID adds the Device Offset to the message device ID. Subtract-from-Msg-ID subtracts the Device ID Offset from the message device ID. 			
Device ID Offset	 0 = disables Device ID Offset functionality. 1-254 = dependent on the Device ID Offset Mode, is added to or subtracted from the message device ID before the Modbus message is transmitted out the serial port. 			
Modbus To-Master Settings				
Discard Modbus Errors (Default = forwarded to the Modbus network through the ICDM/RX-PN1. Off)				
Modbus Master/S	lave Settings			
Forward Broadcasts from Master (Default = Off)	If selected, all broadcast messages from the serial master will be forwarded to the Modbus network through the ICDM/RX-PN1.			
Private Slave Device ID Range (Default: Min = 1, Max = 1)	This range (1-255) defines the expected slave device ID range on the serial bus. Modbus request messages received on this port within this device ID range will not be forwarded to the Modbus network.			
	The ICDM/RX-PN1 has a built-in auto-detect algorithm for detecting private slave device(s) with ID(s) not defined within the private device ID range.			
	The minimum value must be less than or equal to the maximum value.			

3 Configuring a Modbus Device

3.1 TCP/IP Configuration Page



Use the following procedure to configure Modbus over TCP (not Modbus TCP) characteristics for the port.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Modbus and the Modbus over TCP (not Modbus/TCP) Overview page displays.

P/IP Configuration Modbus/TCP	Configuration Remote	Modbus Configuration	Alias Configuration	
erview Socket 1 Socket 2	Socket 3 Socket 4			
dbus over TCP (not Mod	bus/TCP) Overvie	W		
is the current configuration of the	he Modbus over TCP/IP	socket(s). Select a sock	et port from the menu at	oove to change the
iguration.				
odbus over TCP/IP Settings	Socket 1	Socket 2	Socket 3	Socket 4
Protocol:	Modbus/RTU-to- Master	Modbus/RTU-to- Master	Modbus/RTU-to- Master	Modbus/RTU-to- Master
Enabled:	no	no	no	no
Listen:	no	no	no	no
Listen Port:	8000	8001	8002	8003
Connect To Mode:	Never	Never	Never	Never
Connect Port	0	0	0	0
Disconnect Mode:	Never	Never	Never	Never
Idle timeout (ms):	0	0	0	0
Rx Timeout Between Packets (ms):	100	100	100	100
Discard Modbus Error	no	no	no	no

3. Click the device number that you want to configure and the corresponding page displays.

Report Function Function	Modbus Network Data N	lapping Diagnostics System IC	DM-RX/PN1-4DB9/2RJ45-DIN Logout
TCP/IP Configuration Modbus/TCP (Configuration Remote Mod	ous Configuration Alias Configurat	ion
Overview Socket 1 Socket 2	Socket 3 Socket 4		
Modbus over TCP (not Mode	ous/TCP) Socket 1 Co	onfiguration	
TCP Configuration		TCP/IP Port note	
Connect To Mode: Enable: Listen: Listen Port: Connect To Mode: Connect Port: Connect IP Address: Disconnect Mode: Idle Timeout (ms): Rx Timeout Between Packets (ms): Discard Modbus Error Responses:	Modbus/RTU-to-Master	TCP/IP ports 0, 22, 23, 80, 443, 502, 4606 and 4607 are no	t allowed.
			Save
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4. Configure the Modbus settings to match the device that you plan on using and click **Save** when you are done.



Modbus over TCP (not Modbus/TCP) Socket Configuration Page			
TCP Configuration	1		
Connect To Mode	 Modbus/RTU-to-Master – Configures the TCP/IP connection(s) to communicate to Modbus/RTU master(s). Modbus/ASCII-to-Master – Configures the TCP/IP connection(s) to communicate to Modbus/ASCII master(s). 		
Enable (Default = Off)	If selected, this TCP/IP socket interface will be enabled		
Listen (Default = Off)	If selected, the TCP/IP socket interface will listen for a connection at the specified Listen Port.		
Listen Port (Defaults: Port 1=8000 Port 2=8001 Port 3=8002 Port 4=8003)	 The Listen Port values are 1-65535. If Enable and Listen are both selected, allows acceptance of: Up to six connections from external applications if there is no active Connect-to connection. Up to five connections if there is an active Connect-to connection. The following TCP/IP ports are not allowed: 0, 22, 23, 80, 443, 502, 4606, and 4607. 		
Connect to Mode (Default = Never)	 If Enable is selected, this setting determines how to connect to an application. If Never: Do not attempt to make a connection. If Connect-Always: Always attempt to maintain a connection to the application at Connect IP Address and Connect Port 		
Connect Port (Default = 0)	Socket port to connect to (1 to 65535). Used in conjunction with Connect to Mode and Connect IP Address.		
Connect IP Address (Default = 0)	IP Address of application to create a connection. Used in conjunction with Connect to Mode and Connect Port. The IP Address of this ICDM-RX/PN1 will not be accepted as valid configuration data.		
Disconnect Mode (Default = Never)	 Mode on which to disconnect from the application. Never – Will not disconnect when connection(s) are idle. Idle– Utilizes the Idle Timer to determine when to close the connection. 		
Idle Timer (Default = 0)	If the Disconnect Mode is set to Idle, the idle or inactivity time (1 to 65535 ms) when the connection(s) will be closed.		
Rx Timeout Between Packets (Default = 100)	Receive timeout (0-65565) between packets in msec. This is the maximum spacing between received bytes allowed before the received Modbus message is expected to be complete.		
Discard Modbus Error Responses	If enabled, Modbus error responses are discarded.		

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3.2



Modbus/TCP Configuration Page

Use the following procedure to configure Modbus/TCP characteristics for the port.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Modbus | Modbus/TCP Configuration and the Modbus/TCP Configuration page displays.

lodbus/TCP Config	uration		
Modbus/TCP Slave (F	rom Master) Configuration	TCP/IP Port note	
	Enabled TCP/IP Port	TCP/IP ports 0, 22, 23, 80,	
Modbus/TCP Port 1:	yes 502	443, 4606 and 4607 are not allowed.	
Modbus/TCP Port 2	503		
Modbus/TCP Port 3	505		
Modbus/TCP Port 4	506		
Modbus/TCP Port 5	507		
Modbus/TCP Port 6	508		
Modbus/TCP Port 7	509		
Modbus/TCP Port 8	510		
Options:			
Discard Modbus Error Res	oonses: 🗌		
Discard Modbus Error Res	oonses:		

3. Configure the characteristics for your environment. Refer to the following table for information about this page.

Modbus/TCP Configuration Page								
Modbus TCP/IP Port 1	Modbus TCP/IP Port 1							
Enabled	Always enabled. Cannot be disabled.							
TCP/IP Port	The standard Modbus TCP/IP port of 502. This port is always enabled.							
Modbus TCP/IP Ports	2 to 8							
Enabled (Default: No)	If selected, the ICDM-RX/PN1will listen for Modbus/TCP requests on the configured TCP/IP port.							
TCP/IP Port Default Port $2 = 503$ Default Port $3 = 505$ Default Port $4 = 506$ Default Port $5 = 507$ Default Port $6 = 508$ Default Port $7 = 509$ Default Port $8 = 510$	The specified TCP/IP port(1-65535) that the ICDM-RX/PN1 will listen for Modbus/TCP requests on. Default ports are the first seven unassigned ports, as determined by the Internet Assigned Numbers Authority after the standard Modbus/TCP port of 502. TCP/IP ports 0, 22, 23, 80, 443, 4606 and 4607 are not allowed. Enabling TCP/IP ports other than the defaults may cause disruptions on your network. Please verify any configuration abardees with your IT department.							

3.3

Remote Modbus/TCP Device Configuration Page



Use the following procedure to configure Modbus/TCP Device characteristics for the port.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Modbus I Remote Modbus Configuration and the Modbus/TCP Configuration page displays.

emote	Modbus/TCP D	evice Configur	ation							
dd Remote Device ID	Configuration Remote IP Address	Remote Modbus/TCP Port	Timeout (ms)	Enable Substitute Device ID	Substitute Device ID	Dedicated Connection	Send Writes First	Disable Broadcast Messages	Route on Pre-Alias Device ID	Delete
124	10.8.40.12	502	1000							
125	10.8.40.12	502	1000							
126	10.8.9.23	502	1000							
127	10.8.9.23	502	1000							
									Delete All	

Click the **Add Remote Configuration** button to add additional remote devices. Refer to the following table for details.

Remote Modbus/TC	P Device Configuration Page
Device ID #	The Device ID (also often called the unit ID) of the remote device must be unique. The Device ID range is 1-255.0 means that it is not configured.
Remote IP Address	IP address of the Modbus/TCP device. All 0s means that it is not configured. The IP address of the ICDM-RX/PN1 will not be accepted as valid configuration data.
Remote Modbus/TCP Port (Default = 502)	The TCP/IP port (1-65535) to connect to on the remote device.
Timeout (ms) (Default = 1000 msec)	The maximum allowable time (0 to 65535 msec) for a slave device to respond to a message before the message is considered timed out.
Enable Substitute Device ID	 If this option is selected: In all messages sent to the Modbus/TCP device, the configured Device ID will be replaced with the Substitute Device ID. The response received from the device, which will contain the Substitute Device ID, will then be changed back to the Device ID before returning the response to the message originator.
Substitute Device ID	The device ID used if the Enable Substitute Device ID option is selected.
Dedicated Connection (Default = Off)	If selected, a dedicated Modbus/TCP connection will be used to connect to this remote device. This is most commonly used when connecting to another gateway, multiple devices are being accessed, and maximum bandwidth is desired.

Remote Modbus/TC	P Device Configuration Page (Continued)
Send Writes First (Default = Off)	If selected, will forward write messages before forwarding any pending read messages. This is most commonly used when multiple messages may be outstanding for the remote device(s) and low latency for write messages is desired.
Disable Broadcast Messages (Default = Off)	If selected, will disable broadcasts to this remote device. If multiple remote devices are accessed through another gateway, then this option must be selected for all remote devices configured to that gateway to prevent broadcast messages from being sent to those devices.
Route on Pre-Alias Device ID (Default = Off)	 This setting only applies to a Modbus message if the following two statements are true: The Modbus message device ID has been aliased, or changed, as a result of a corresponding Alias Device ID configuration via the Modbus Alias Id Configuration page. A Remote Modbus/TCP Device configuration exists for the prealiased, or original, device ID. If selected and all requirements are true, then the Remote Device ID configuration for the pre-aliased device ID will be applied to the Modbus message. This includes the IP address/port, timeout and control flags.
Delete	If enabled, that Device ID or IDs are deleted when you click the Save button.

3.4 Alias Configuration Page



Use the following procedure to configure Modbus Alias Device ID configuration characteristics for the port.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Modbus I Alias Configuration and the Modbus Alias Device Id Configuration page displays. Refer to the following table for information about the configuration options

FICDM-RX/PN1 [icdmrxpn1]	×	+									[×
\leftarrow \rightarrow C \textcircled{a}	2 🔏	10.8.11.201	/modbusA	liasConfig.asp			… ⊚	☆	l	1	Ð	٢	≡
	Serial	Modbus	Network	Data Mapping	Diagnost	ics System	n ICDM-					Log	out
TCP/IP Configuration Modbu	us/TCF	Configurat	tion Remo	ote Modbus Conf	iguration	Alias Confi	guration						
Modbus Alias Device I	d Co	nfigurat	ion										

Rx Device ID	Alias Device ID	Modbus/TCP Master	Modbus Serial Master	Modbus over TCP Master	Delete
10	105				
19	106				
21	107				
				Delete All	
					Save
					Save

Modbus Alias Device Id Configuration Page						
Rx Device ID	The device ID (also often called the unit ID) of the received message from a master. Device IDs range from 1 to 255.					
Alias Device ID	The alias device ID to convert the received device ID to. Alias Device IDs range from 1 to 255.					
Modbus/TCP Master (Default = Off)	If selected, this applies the alias device ID configuration to messages received from Modbus/TCP masters.					
Modbus Serial Master (Default = Off)	If selected, this applies the alias device ID configuration to messages received from serial Modbus masters.					
Modbus over TCP Master (Default = Off)	If selected, this applies the alias device ID configuration to messages received from Modbus RTU/ASCII over Ethernet TCP/IP masters.					

4 Configuring the ICDM-RX/PN1 in TIA Portal

4.1 Installing the GSD File



Use the following steps to install the ICDM-RX/PN1 GSD file into TIA Portal.

1. Open the ICDM-RX/PN1 home page, download and unzip the GSDML zip file to a working directory.

If you have not previously configured an IP address using PortVision DX, the default IP address is 192.168.250.250 with a subnet mask of 255.255.0.0. If you do not use PortVision DX to program the IP address, you may need to change your system IP address to initially communicate with the ICDM-RX/PN1.

- 2. Open TIA Portal and click Project View.
- 3. Use the Options | Install general station description file (GSD) menu to install the GSD file.

4.2 Adding the ICDM-RX/PN1



Use these steps to add the ICDM-RX/PN1

1. From the Hardware catalog, under Other field devices | PROFINET IO | Gateway | Pepperl+Fuchs | ICDM-RX/PN1, select the model corresponding to your device, and drag it into the Network view area. To connect the device to PLC, click the link on the device and select PLC_1.PROFINET interface_1 from the pop-up menu, as shown in the following screen shot.



3. A valid IP address and a device name are required to establish a connection (Application Relationship) between an ICDM-RX/PN1 gateway and an IO controller. The next two subsections describe various methods to assign IP address and device name to the ICDM-RX/PN1.

4.3 IP Address Assignment



The ICDM-RX/PN1 gateway supports three methods for IP address assignment according to GSDML Specification V2.32.

- LOCAL A device specific method for IP address assignment.
- DHCP The Dynamic Host Configuration Protocol for IP address assignment.
- DCP IP address assignment via Discovery and basic Configuration Protocol (DCP).



Note

The ICDM-RX/PN1's default IP address is 192.168.250.250 and the default subnet mask is 255.255.0.0. You may need to change your laptop or PC IP address range to access the web interface or you can use PortVision DX to change the IP address without changing your settings. Refer to the *ICDM-RX Hardware Installation and Configuration Manual* for detailed information.

4.3.1 Assigning an IP Address Statically

IP addresses can be assigned statically using one of the following methods:

- Embedded web interface (or PortVision DX)
- Assign IP address function of TIA Portal on-line access

Assigning IP Address Statically Using the Web Page



4.3.1.1

You can use the following procedure to configure a static IP address using the web interface.

- 1. Open a web browser and enter the ICDM-RX/PN1 gateway address.
- 2. Click Network | Configuration.
- 3. Select the Use static config below radio button.



- 4. Enter an IP address, subnet mask, and gateway address.
- 5. Click the Save button.

COMTROL Home Serial Mo	bus Network Data Mapping Diagnostics System ICDM-RV/	PN1-4DB9/2RJ45-DIN Logout
Configuration Password Security Key Network Configuration	/s/Certs	
General Device Name: icdmrxpn1 TCP Keepalive: 60 s Boot Timeout: 15 s Telnet Timeout: 300 s	IP Configuration (IPv4) ○ Use DHCP ③ Use static configuration below: IP Address: 192.168.250.250 Subnet Mask: 255.255.0.0 Default Gateway: 192.168.250.1 NOTE: Changing these options will cause the gateway to reboot.	
	Default settings displayed.	
		© Pepperl+Fuchs Comtrol, Inc

A reboot is required for the new IP address to take effect.

6. Click System I Reboot and the ICDM-RX/PN1 will reboot in 10 seconds or you can click on the Reboot Now button to reboot immediately.

	Home	Serial	Modbus	Network	Data Mapping	Diagnostics	System	ICDM-RX/PN1-4DB9/2RJ45-DIN	Logout
Update Firmware	Configura	tion File	System	Snapshot	Restore Defaul	ts Reboot			
Rebooting will drop ICDM-RX. Reboot Now	all connec	tions, ap	oply any p	ending set	tings, and restar	t the			_
								© Pepperl+Fuchs Cor	ntrol, Inc.





Assigning IP Address Statically Using TIA Portal You can also use the following procedure to configure a static IP address using TIA Portal.

1. Double-click Project tree | Online access | Your Ethernet Adapter | Accessible device [192.168.250.250] | Online & diagnostics to open the Online access window, where Your Ethernet Adapter is the name of your networking interface, and Accessible device [192.168.250.250] is the gateway, as shown in this figure.

Project tree	•
Devices	
1 O O III	2
Online access	
🍸 Display/hide interfaces	
Intel(R) 82562V-2 10/100 Network Conne	. 📷
🔻 🛄 D-Link DGE-530T Gigabit Ethernet Adapter	
Pupdate accessible devices	
 Accessible device [192.168.250.250] 	
🞖 Online & diagnostics	



- 2. Click Functions | Assign IP address and enter the desired IP configurations, as shown in the next screen shot.
- 3. Click the **Assign IP address** button and then the IP configuration is assigned to the gateway.



You can access the gateway using the new IP address immediately. A reboot is not required.

4.3.1.3



Configuring TIA Portal Project Not to Set the IP Address

When using static IP address assignment either through the web interface or TIA Portal on-line access, you will need to configure the TIA Portal project not to set IP address in project.

- 1. In TIA Portal, double-click the ICDM-RX/PN1 module to open the Device View.
- 2. On the **Properties I General** tab, click the **PROFINET interface [X1] I Ethernet** addresses, which opens the Ethernet addresses properties window.
- 3. Make sure the IP address is set directly at the device radio button is selected, as shown in this figure.

General 10 tags System constants Texts General Catalog information Ethernet addresses Interface networked with General Ethernet addresses Interface networked with General Subnet: PNNE_1 Advanced options Interface networked with Interface networked with Interface options Nadd new subnet Interface networked with Interface options Interface networked with IP protocol Port 1 [X1 P1] Port 2 [X1 P2] IP protocol IP protocol Set IP address in the project Hardware interrupts Subnet: 192 168 250 250 Shared Device Synchronize router settings with IO controller Use router Bouter address: 0 0 0	CDMRXPN1	[ICDM-RX/P	N1-4DB9/2RJ45-DIN]			S Properties				
General Catalog information Ethernet addresses PROFINET interface [X1] General Interface networked with Ethernet addresses Subnet: PNNE_1 Add new subnet Interface options Interface options Interface options Add new subnet Port 1 [X1 P1] Port 2 [X1 P2] Identification & Maintenance IP protocol Hardware interrupts Subnet: Shared Device Synchronize router settings with IO controller Use router Bouter address: 0	General	IO tags	System constants	Texts						
PROFINET interface [X1] Interface networked with General Subnet: Ethernet#addresses Subnet: Advanced options Add new subnet Interface options Add new subnet Port 1 [X1 P1] Port 2 [X1 P2] Identification & Maintenance IP protocol Hardware interrupts Subnet: Shared Device Subnet: Image: Subnet interrupts Subnet: Shared Device Subnet: Image: Subnet interrupts Subnet: Image: Subnet interrupts Subnet: Shared Device Subnet: Image: Subnet interrupts Subnet: Image: Subnet interrupts Subnet: Image: Subnet interrupts Subnet: Image: Subnet interrupts Subnet interrupts Image: Subnet inte	General Catalog in	nformation	Ethernet addres	sses						
Ethernet addresss Subnet: PNIE_1 • Advanced options Interface options • Real time settings • Port 1 [X1 P1] • Port 2 [X1 P2] Identification & Maintenance Hardware interrupts Shared Device IP protocol Port 1 [X1 P1] Port 2 [X1 P2] Identification & Maintenance Hardware interrupts Shared Device IP address: 192, 168, 250, 250 Subnet mask: 255, 255, 0, 0 Shared Device Synchronize router settings with IO controller Use router O 0, 0	PROFINET interface [X1] General Ethernet addresses		Interface ne	Interface networked with						
Advanced options Interface options Real time settings Port 1 [X1 P1] Port 2 [X1 P2] Identification & Maintenance Hardware interrupts Shared Device Shared Device Subnet mask: 255,255,0,0 Synchronize router settings with IO controller Use router Router address: 0,0,0,0				Subnet:	PN/IE_1					
Real time settings Port 1 [X1 P1] Port 2 [X1 P2] Identification & Meintenance Hardware interrupts Shared Device If address: 192 168 255 255 0 Subnet mask: 255 255 0 O Synchronize router settings with 10 controller Use router Router address: 0 0 0	 Advanced Interfa 	f options ce options			Add new subne	et				
Port 1 [X1 P1] Port 2 [X1 P2] Identification & Maintenance Hardware interrupts Shared Device Subnet mask: 255, 255, 0, 0 Synchronize router settings with 10 controller Use router Router address: 0, 0, 0, 0	Real til	me settings	ID protocol							
Port 2 [X1 P2] Identification & Maintenance Hardware interrupts Shared Device Subnet mask: 255, 255, 0, 0 Synchronize router settings with 10 controller Use router Router address: 0, 0, 0, 0	Port 1	[X1 P1]	ir protocor							
Identification & Maintenance Hardware interrupts Shared Device IP address: 192.168.250.250 Subnet mask: 255.255.0.0 Synchronize router settings with 10 controller Use router Router address: 0.0.0.0	Port 2	[X1 P2]			O Set IP address in th	ne project				
Hardware interrupts	Identification	n & Maintenand	e -		IP address:	103 168 350 360				
Shared Device Subnet mask: 255, 255, 0, 0 Synchronize router settings with IO controller Use router Router address: 0, 0, 0, 0	Hardware in	terrupts	•		n autorezz.	192 100 200 200				
Synchronize router settings with IO controller Use router Router address: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Shared Device				Subnet mask:	255.255.0.0				
Use router Router address: 0.0.0.0					Synchronize router	settings with 10 controller				
Router address: 0 0 0 0					Use router					
					Router address:	0.0.0				
IP address is set directly at the device				1	IP address is set di	rectly at the device				



4.3.2 Assigning an IP Address via DHCP

>

The ICDM-RX/PN1 gateway supports DHCP for IP address assignment. DHCP is disabled by default. Use the following steps to enable DHCP.

- 1. Open a web browser and enter the ICDM-RX/PN1 IP address. The default IP address is 192.168.250.250.
- 2. Click Network | Configuration.
- 3. Select the **Use DHCP** radio button and click the **Save** button.

ecomtrol Home Serial Mod	ous Network Data Mapping Diagnostics System ICDM-RX	/PN1-4DB9/2RJ45-DIN Logout
Configuration Password Security Keys Network Configuration General Device Name: icdmrxpn1 TCP Keepalive: 60 s Boot Timeout: 15 s Telnet Timeout: 300 s	/Certs IP Configuration (IPv4) Use DHCP Use static configuration below: IP Address: 10.8.11.201 Subnet Mask: 255.255.0.0 Default Gateway: 10.8.0.253 NOTE: Changing these options will cause the gateway to reboot.	
		© Pepperl+Fuchs Comtrol, Inc.

A reboot is required for the change to take effect.

 Click System I Reboot and the ICDM-RX/PN1 will reboot in 10 seconds or you can click on the Reboot Now button to reboot immediately.

	Home Serial	Modbus Nel	twork Data Mappi	ng Diagnostics	System	ICDM-RX/PN1-4DB9/2RJ45-DIN	Logout
Update Firmware	Configuration File	e System Sna	pshot Restore De	aults Reboot			
Reboot							
Rebooting will drop ICDM-RX.	all connections, a	pply any pendi	ng settings, and re	start the			
Reboot Now							
							ntrol Inc

Once rebooted, the gateway attempts to obtain an IP address from a DHCP server. You can use PortVision DX to find out the new IP address of the gateway or do a network scan in TIA Portal.



Notes

- DHCP can only be enabled or disabled via the web interface. Certain versions of SIMATIC STEP 7 have a function to enable DHCP if a PROFINET IO device supports it. However, the ICDM-RX/PN1 does not support enabling DHCP through STEP 7.
- Similar to static IP address assignment, when DHCP is enabled, you will need to configure the TIA Portal project not to set IP address in project. Refer to *Configuring TIA Portal Project Not to Set the IP Address* (Page 22) to set the IP address is set directly at the device option.



4.3.3 Assigning an IP Address via IO Controller



An IO controller can assign IP address to the ICDM-RX/PN1 via DCP. The IO controller and the ICDM-RX/PN1 gateway have to be on the same subnet.

- 1. In TIA Portal, double-click the ICDM-RX/PN1 module to open the **Device View**.
- 2. On the **Properties I General** tab, click the **PROFINET interface [X1] I Ethernet addresses**, which opens the **Ethernet addresses properties** window.

CDMRXPN1 [ICDM-RX/PN1-4	DB9/2RJ45-DIN]		Properties
General IO tags Sy	stem constants Text	5	
General Catalog information	Ethemet addresses		
PROFINET interface [X1] General	Interface networked	l with	
Ethernet addresses		Subnet: PN/IE_1	
· Advanced options		Add new subnet	
Interface options			
Real time settings	IP protocol		
Port 1 [X1 P1]	in protocor		
Port 2 [X1 P2]	1	 Set IP address in the project 	
Identification & Maintenance	6	IP address 102 168 20	0. 250
Hardware interrupts	÷ .	1 100 132 . 100 . 23	0 - 250
Shared Device		Subnet mask: 255 . 255 . 0	. 0
		Synchronize router settings with IO c	ontroller
		Use router	
		Router address: 0 0 0	0

- 3. Make sure the Set IP address in the project radio button is selected.
- 4. Manually enter the IP address for the ICDM-RX/PN1 gateway.
- 5. Compile and download the project.

The new IP configuration takes effect when a connection is established between the ICDM-RX/PN1 and the IO controller. A reboot is not required.

4.3.4 Special Considerations Regarding IP Assignment

When an IP address is assigned by an IO controller, the ICDM-RX/PN1 does not store the assigned IP address in the non-volatile memory. If the ICDM-RX/PN1 is rebooted, it starts with the 0.0.0.0 IP address after the reboot. The ICDM-RX/PN1 stays in that state until a connection is reestablished with the IO controller, at which point the (same) IP address is reassigned by the IO controller. This behavior is a requirement of the PROFINET specification.

Since the 0.0.0.0 is not a valid IP address, the ICDM-RX/PN1 is not assessable via the web interface, Telnet, or SSH. You can use PortVision DX and TIA Portal to discover the ICDM-RX/PN1 and assign a static IP address. For information using PortVision DX to configure the IP address, refer to the *ICDM-RX Hardware Installation and Configuration Manual*.

Pepperl+Fuchs recommends using static IP address assignment when possible. The web interface always works regardless of the presence of an IO controller or not.

In addition, DCP IP assignment overwrites the static or DHCP IP assignment. For example: an IO controller is configured to set IP address in the project. The IO controller is powered off temporarily. A new IP address is assigned to the ICDM-RX/PN1 using PortVision DX. Later when the IO controller is turned back on, it changes the gateway's IP address back to the address that was configured in the project.



4.4 Device Name Assignment

Use one of the following methods to configure the Device Name.

- Web interface
- TIA Portal

4.4.1 Assigning the Device Name Using the Web Interface



You can use the Network | Configuration page to assign the device name for PROFINET IO.

- 1. If necessary, open the gateway web interface with your web browser using the IP address.
- 2. Click Network | Configuration.
- 3. Enter the PROFINET IO Device Name. The PROFINET IO device name is not case-sensitive and the default is empty. The device name must be specified according to DNS conventions.
 - Parts of the name within the device name; in other words, a string between two periods, must not exceed a maximum of 63 characters.
 - No special characters such as umlauts (**ä**, **ö** etc.), brackets, underscore, slash, blank etc. The dash is the only permitted special character.
 - The device name must not begin or end with the "-" character.
 - The device name must not begin with numbers.
 - The device name must not have the structure **n.n.n.n** (n = 0...999).
 - The device name must not begin with the character string "port-xyz-" (x, y, z = 0...9).
- 4. Click the **Save** button.

COMTROL Home Serial Mod	bus Network Data Mapping Diagnostics System ICDM-RX/PN1-4D89/2R345-D	N Logout
Configuration Password Security Keys Network Configuration	/Certs	
General Device Name: icdmrxpn1 x	IP Configuration (IPv4) O Use DHCP	
TCP Keepalive: 60 s Boot Timeout: 15 s Telnet Timeout: 300 s	Use static configuration below: IP Address: 10.8.11.201 Subnet Mask: 255.255.0.0 Default Gateway: 10.8.0.253 NOTE: Changing these options will cause the gateway to reboot.	
	Saye	
	© Pepperl+Fuchs	Comtrol, Inc.

A reboot is required for the new name to take effect.



5. Click System I Reboot to reboot the gateway.



4.4.2 Assigning the Device Name in TIA Portal



Use the following procedure to configure the Device Name using TIA Portal.

- 1. In TIA Portal, open on-line access.
- 2. Click Function I Assign name, enter the desired PROFINET device name.
- 3. Click the Assign name button.



 Diagnostics 	A						
General	Assign PROFINET device name						
 Functions 							
Assign IP address							
Assign PROFINET device name	Configured PROFINET device						
Reset to factory settings	BROCHIET during an and	ICDN/RVPN1					
	PROFINE I device name:	ICOMRAPNI					
	Device type:	ICDM-RX/PN1-4DB9/2R					

The new device name takes effects immediately. A reboot is not required.



4.4.3 Configuring the Device Name in TIA Portal Project



After assigning a device name to the ICDM-RX/PN1, the same device name also needs to be configured in the TIA Portal project.

- 1. In TIA Portal, double-click the ICDM-RX/PN1 module to open the **Device View**.
- 2. On the Properties I General tab, click the PROFINET interface [X1] I Ethernet addresses, which opens the Ethernet addresses properties window.
- 3. When the **Generate PROFINET device name automatically** check box is selected, a default device name is entered automatically. If the ICDM-RX/PN1 has been assigned a different device name, then un-check the check box and manually enter the device name.

CDMRXPN1	[ICDM-RX/PN	1-4DB9/2RJ45-DIN]		Q Properties		
General	IO tags	System constants	Texts			
General		Π		 IP address is set directly at the device 		
Catalog i	nformation					
PROFINET int	terface [X1]	PROFINET				
General						
Ethernet	addresses			Generate PROFINET device name automatically		
▼ Advance	d options	PROF	NET device name:	icdmrxpn1 icdmrxpn1		
Interfa	ce options					
Real ti	ime settings		Converted name:			
Port 1	[X1 P1]		Device number:	1		
Port 2	[X1 P2]					
Identificatio	n & Maintenance	e -				
Hardware in	terrupts					
Shared Devi	ice	-				

4. Compile and download the project.



Notes

- Configuring a PROFINET device name in the project does not automatically assign that name to the ICDM-RX/PN1. Use the procedures in Assigning the Device Name Using the Web Interface (Page 25) or Assigning the Device Name in TIA Portal (Page 26) to assign a device name to the ICDM-RX/PN1.
- The device name must be unique on the network.



4.5 Establishing a PROFINET IO Connection

At this point, an ICDM-RX/PN1 gateway was added to a TIA Portal project, the IP address and device name were assigned. The next step is to establish a connection between the gateway and IO controller before starting configuration of the IO modules. You may need to compile and download the project and if necessary, reboot the ICDM-RX/PN1.

Open the **Diagnostics I PROFINET IO Diagnostic** web page on the ICDM-RX/PN1. Verify under the PLC Interface section, that a PROFINET IO connection has been successfully established between the gateway and IO controller, the Active Application Relationships should be 1. The **Status** LED has a solid, steady light on the ICDM-RX/PN1 and the status LED(s) on the IO controller should be solid green.

Frequent Forme Serial Mod	lbus Network	Data Ma	apping	Diagnostics
Communication Modbus Diagnostics PR	ROFINET IO Dia	nostics	Data M	lapping Diagr
System Information				
System Information				
PLC Interface				7
PLC Interface Active Application Relationships:	1			
PLC Interface Active Application Relationships: Application Relationship 1 Uptime:	1 00:01:03	5		
PLC Interface Active Application Relationships: Application Relationship 1 Uptime: Application Relationship 2 Uptime:	1 : 00:01:0 : N/A	5		

If a connection has not been established, here are some troubleshooting tips:

- Check if the correct GSD file is installed in TIA Portal.
- Check if the ICDM-RX/PN1 module in TIA Portal is using the right GSD revision. If an
 older version of the GSD file was installed before, you may need to change GSD revision,
 or remove the ICDM-RX/PN1 device(s) from an existing project, and reinsert it after the
 new GSD file is installed.

ICDMRXPN1 [I	CDM-RX/PN	1-4D	B9/2RJ45-DIN]			📴 Properties 🚺 Info 🚺 🗓 Diagnostics				
General	IO tags	Sys	tem constants	Texts						
✓ General Catalog info	ormation		Catalog informa	ation						
 PROFINET interf General 	face [X1]	_		Short designa	ation:	ICDM-RX/PN1-4DB9/2RJ45-DIN				
Ethernet ad Advanced o	dresses ptions			Descrip	otion:	4 serial ports; 2 Ethernet ports; DIN rail mount with DB9 connectors				
Interface Real time	options settings									
IO cyc Port 1 [X1	le 1 P1]	•								
Port 2 [X1 Identification 8	1 P2] Maintenance			Firmware ver	e no.: rsion:	V1.0.5				
Hardware inter	rrupts		Hardwar	e product ver	rsion:	1				
Shared Device				GSI	D file:	gsdml-v2.35-pepperl+fuchs-icdmrxpn1-20200304.xml				
						Update module description				

- Check if the right model is added in the project.
- Remove any modules and submodules of the ICDM-RX/PN1 in TIA project. Only keep the head module.
- Check if the gateway has a valid IP address. See IP Address Assignment (Page 20) for IP address assignment.
- Verify that the gateway has a valid device name. See *Device Name Assignment* (Page 25) for assigning device name.
- Make sure there are no other devices on the same network using the same IP address or device name.

TDOCT-6598 0220

- Make sure the matching device name is configured in TIA Portal project.
- Make sure there is no other IO controller that is having or trying to establish a connection with the gateway.
- Go to **Diagnostics I System Log** web page, look for any possible error messages.

4.6 Status LED Behavior

The ICDM-RX/PN1 has a single Status LED.

Status LED Activity						
Blinks every 10 seconds	No PLC connection					
On (solid)	One or more PLC connections have been established					
Flashing	 LED flashing mode is enabled in PortVision DX Error detection or diagnostics information available 					

4.7 Configuring IO Modules

IO modules are used to exchange input and output data with the shared memory blocks provided by the ICDM-RX/PN1. The ICDM-RX/PN1 gateway has two categories of IO modules:

- Coils for accessing shared coils
- · Holding Registers for accessing shared holding registers

4.7.1 Inserting IO Modules and Submodules



Use the following procedure to insert IO modules and submodules.

- 1. Double-click the ICDM-RX/PN1 module in the **Network** view to open the **Device overview** window.
- 2. From the **Catalog I Module**, select the **Coils** or **Holding Registers** and drag it into one of the highlighted slots in the **Device overview** window.

Device overview									
Y Module	 Rack	Slot	Laddress	Q address	~	Catalo	g		
ICDMRXPN1	0	0				Search>		ini.	init
Interface	0	0 X1				Filter	<alb.< td=""><td></td><td>-</td></alb.<>		-
	0	1			1	Can Hand	Imadula	1000	
	0	2			Module				
					Coils				
							olding Regis	sters	

- Slot 1 is reserved for Holding Registers.
- Slot 2 is reserved for Coils.

Once an IO module is inserted into a slot, you can configure the submodules for that IO module. There are input and output submodules with various IO sizes.

Device overview								-
Y Module		Rack	Slot	I address	Q address	✓ Catalog		
 ICDMRXPN1 		0	0			<search></search>	iril.	init
Interface		0	0 X1			Filter Calls	-	(mb)
 Holding Registers_1 		0	1			N The Hand module		
Read 100 Registers		0	11	68267		- Intead module		
Read 200 Registers		0	12	268667		- Module		
Write 100 Registers		0	13		64263	Colls		
Write 200 Registers	0 14		264663	Holding Registers				
		0	15			Submodules		
		0	16			Read 25 Regist	ters	
		0	17			Read SU Registe	ers	
		0	18			Read 100 Regist	ers	
		0	2			Read 200 Regist	ers	
						Write 25 Regist	ers	
						Write 50 Regist	ers	
						Write 100 Regist	ers	
						Write 200 Regist	ers	

Each submodule can be inserted to one of the eight available sub-slots of an IO module. Subslot 1 is reserved for Block 1 of the shared Holding Registers or Coils. Sub-slot 2 is for the Block 2 of shared Holding Registers or Coils, so on and so forth.

Sub-Slot	Allowed Submodules
1-8 of a Holding Register	Read 25, 50, 100, or 200 Registers Write 25, 50, 100, or 200 Registers
1-8 of a Coils	Read 48, 80, 160, or 320 Coils Write 48, 80, 160, or 320 Coils

In the *Inserting Submodules in TIA Portal* figure (above), a Read 100 Registers submodule and a Read 200 Registers submodule are inserted in sub-slot 1 and 2 of slot 1 respectively. A Write 100 Registers submodule and a Write 200 Registers submodule are inserted in sub-slot 3 and 4 of slot 2 respectively.

The PLC therefore will read 100 holding registers at shared block 1 and 200 holding registers at shared block 2, also write to 100 holding registers at shared block 3 and 200 holding registers at shared block 4.

Similarly, you can configure a Coils module by inserting desired input and output submodules into the sub-slots of the Coils module.

Here are some tips when configuring IO modules and submodules.

- A Coils or Holding Registers module must be inserted first in order to configure the submodules.
- If you do not find an exact matching IO size, select the next size (larger). For instance, use the Read/Write 100 Holding Registers submodule for a device that has 80 holding registers.
- The sub-slots are independent. However, each block must have the correct read or write access enabled for PROFINET IO. Use web page Data Mapping I Shared Memory to configure share memory blocks read/write access.
- Each sub-slot can only have one submodule. Therefore the block can only have read only
 or write only access.

Note

Certain versions of TIA Portal may not allow a module without any submodules. You must insert at least one submodule for a Coils and Holding Registers module.



4.8 Setting the IO Cycle Update Time



Use the following procedure to set the IO Cycle Update Time.

- 1. Double-click the ICDM-RX/PN1 module to open the **Device View**.
- 2. On the Properties I General tab, click the PROFINET interface [X1] I Real time settings, which opens the Real time settings window.
- **3.** Select the **Set update time manually** radio button and select the desired update time. The fastest IO cycle update time is 8ms.

DM4P2E [Mod	lule]				Properties	1 Info	C Diagnostics	
General	IO tags	Syster	m constants Texts			Sec. Parts		
General Catalog information PROFINET interface [X1] General			Real time settings NO cycle					
Ethernet ac Advanced o Interface	Ethernet addresses Advanced options Interface options		Update time					ms
Real tim Port 1 [X Port 2 [X	Real time settings Port 1 [X1 P1] Port 2 [X1 P2]		Can be set Adapt update time when send	l clock changes	8.000			ms
Hardware identifier Identification & Maintenance Hardware identifier Shared Device		e	Watchdog time Accepted update cycles without 10 data:	3				
			Watchdog time:	24.000				ms

Project Example

>

5

This section demonstrates how to read and write shared memory blocks in PLC. This example uses an ICDM-RX/PN1-4DB9/2RJ45-DIN. By default, the Holding Registers Block 1-2 and Coils Block 1-2 are PROFINET IO readable. The Holding Registers Block 3-4 and Coils Block 3-4 are PROFINET IO writeable.

- 1. In a new TIA Portal project, add an IO controller and the ICDM-RX/PN1-4DB9/2RJ45-DIN.
- 2. Insert a Holding Register module to Slot 1. Then insert two Read 200 Registers submodules into Sub-slot 1 and 2. Insert two Write 200 Registers submodules into Sub-slot 3 and 4, as shown in the figure below.
- 3. Insert a Coils module to Slot 2. Then insert two Read 320 Coils submodules into Sub-slot 1 and 2. Insert two Write 320 Coils submodules into Slot 2 Sub-slot 3 and 4.

🐈 Module	 Rack	Slot	I address	Q address
 ICDMRXPN1 	0	0		
Interface	0	0 X1		
 Holding Registers_1 	0	1		
Read 200 Registers	0	11	68467	
Read 200 Registers_1	0	12	468867	
Write 200 Registers	0	13		64463
Write 200 Registers_1	0	14		464863
	0	15		
	0	16		
	0	17		
	0	18		
 Coils_1 	0	2		
Read 320 Coils	0	21	868907	
Read 320 Coils_1	0	22	908947	
Write 320 Coils	0	23		864903
Write 320 Coils_1	0	24		904943
	0	25		
	0	26		
	0	27		
	0	28		

5.1 Reading Shared Holding Registers



The first Read 200 Registers submodule has an input IO address range 68..467 (400 bytes), which is mapped into 200 16-bit holding registers at address range 400001-400200 of the shared Holding Registers Block 1.

- 1. Add a data block Data_block_1 to the project.
- 2. Create an array of 200 of words structure as the input data buffer, called HoldingRegBlock1 as shown in the following figure.

	Da	tal	block1	
		Na	me	Data type S
1	-0	•	Static	
2	-0		HoldingRegBlock1	Array[0199] of Word
3	-00		HoldingRegBlock3	Array[0199] of Word
4	-0		RecRdCoilsBlock	Array[039] of Word
5		•	<add new=""></add>	

3. Add a DPRD_DAT instruction into the main block to copy data from input IO address into the HoldingRegBlock1 structure in the data block, as shown in the following figure.

	Network 1:		
	Comment		
1		0000 047	
		DPRD_DAI	
	EN	ENO -	
	227 - LADDR		%MW10
		RET_VAL	- "RetVal1"
			"Datablock1".
		RECORD	- HoldingRegBlock1
		RECORD	HoldingRegBlock1

- Parameter LADDR Enter the hardware identifier of the input submodule, which can be found in the Properties tab I General I Hardware identifier, as show in the following figure.
- **Parameter** RECORD **Enter** Data_block_1.HoldingRegBlock1.

ead 200 Registers [Read 200 Registers]						
General	IO tags	System constants	Texts			
Show hardwa	are system con	stant 💌			-	
Name			Туре	Hardware identifier	Used by	
	XPN1~Holding	dule 277	PLC_1			

4. Compile and download the project.



5. In TIA Portal, go on-line and watch the Datablock1. The following figure shows the input data value of Holding Registers Block 1.

	Da	tal	olo	ck1			
-		Name			Data type	Start value	Monitor value
1	1 🕣		 Static 				
2	-		•	HoldingRegBlock1	Array[0199] of Word		
3	-			HoldingRegBlock1[0]	Word	16#0	16#0000
4	-0			HoldingRegBlock1[1]	Word	16#0	16#0000
5	-0			HoldingRegBlock1[2]	Word	16#0	16#0000
6	-			HoldingRegBlock1[3]	Word	16#0	16#0000
7	-0			HoldingRegBlock1[4]	Word	16#0	16#0000
8	-0			HoldingRegBlock1[5]	Word	16#0	16#0000
9	-0			HoldingRegBlock1[6]	Word	16#0	16#0000
10	-			HoldingRegBlock1[7]	Word	16#0	16#0000
11	-0			HoldingRegBlock1[8]	Word	16#0	16#0000
12	-			HoldingRegBlock1[9]	Word	16#0	16#0000
13				HoldingRegBlock1[10]	Word	16#0	16#0000

5.2 Writing Shared Holding Registers

The first Write 200 Registers submodule has an output IO address range 64..463 (400 bytes), which is mapped into 200 16-bit holding registers at address range 400401-400600 of the shared Holding Registers Block 3.

- 1. In the same Datablock1, create an array of 200 of words structure as the output data buffer called HoldingRegBlock3.
- 2. Add a DPWR_DAT instruction into the main block to copy data from the HoldingRegBlock3 structure in the data block to output IO address.

Network 2:				
Comment				
	D	PWR_DAT		
281 -	EN LADDR	ENO	%MW12	
"Datablock1". HoldingRegBlock3 —	RECORD	RET_VAL	"RetVal2"	

- Parameter LADDR Enter the hardware identifier of the output submodule, which can be found in the **Properties tab I General** or **System** constants.
- **Parameter** RECORD Enter Datablock1.HoldingRegBlock3.

5.2.1 Access Shared Memory Blocks using Data Record Instruction

Shared memory blocks can also be accessed using the RDREC and WRREC data record instructions.

The ICDM-RX/PN1 allows you to index into a shared memory block, or access multiple consecutive shared memory blocks together using the data record instructions.



The following figure shows an example of a read data record instruction (RDREC) and the table lists its parameters. For more information regarding the RDREC instruction, refer to TIA Portal help system.



RDREC Instruction Parameters	Declaration	Description				
REQ	Input	REQ = 1: Transfer data record				
ID	Input	Hardware identifier of the input submodule.				
INDEX	Input	Record indexes of the input submodule. Note: index uses 16-bit word address.				
MLEN	Input	The length in bytes of the data record to be read.				
VALID	Output	New data record was received and is valid.				
BUSY	Output	BUSY = 1: the reading process is not yet complete.				
ERROR	Output	ERROR = 1: An error occurred during the reading process.				
STATUS	Output	Block status of error information.				
LEN	Output	Length of the read data record information.				
RECORD	InOut	Target range for the data record read.				
i	Name	Address	Display format	Monitor value	Modify value	9
----	---------------	----------	----------------	---------------	--------------	-----
1	"StartRecRd"	%M0.1	Bool	FALSE	TRUE	🗹 🚹
2	"RecRdId"	%MW20	DEC	278	278	M 🚹
3	"RecRdIndex"	%MD22	DEC+/-	10	10	M 🚹
4	"RecRdMLen"	%MW26	DEC	20	20	M 🚹
5	"RecRdBusy"	%M0.3	Bool	FALSE		
6	"RecRdValid"	%M0.2	Bool	TRUE		
7	"RecRdError"	%M0.4	Bool	FALSE		
8	"RecRdStauts"	%MD28	Hex	16#0000_0000		
9	"RecRdLen"	%MW32	DEC	20		
10		Add new>				

A watch table is used to set the parameters of the RDREC instruction and monitor the result.

Example #1: Read 160 coils from address range 161-320 of shared Coils Block 1. Set RecRdld to the hardware identifier (278) of the Read 320 Coils submodule in Slot 2 Sub-slot 1. Set RecRdIndex to 10 (in 16-bit word address), which will index into Block 1 at address 160. Set RecRdMLen to 20, which will read 20 bytes (160 coils) at the address specified by the index parameter. If successful, the target range will contain the data read and the RecRdLen will contain the actual number of bytes read.

Example #2: Read shared Coils Block 1 and 2 together. Set RecRdld to the hardware identifier (278) of the first Read 320 Coils submodule in Slot 2 Sub-slot 1. Set RecRdIndex to 0, which will read from the beginning of Block 1. Set RedRdMLen to 80 (bytes), which will read a total of 640 coils from address 1 to 640 (Block 1 and 2).

Note

Note in Example #2, only the first block needs an IO submodule. The ICDM-RX/PN1 allows data record instructions to access subsequent blocks without corresponding IO submodules. When accessing shared memory blocks, all blocks being accessed must have PROFINET IO read or write access enabled.

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6 Using the Network Menus

6.1 Network Configuration Page



You can use the Network Configuration page to change the ICDM-RX/PN1 network configuration after using PortVision DX for initial network configuration.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Network and the Network Configuration page displays.

ECOMTROL Home Serial Modb	Dus Network Data Mapping Diagnostics System ICDM-RX/PN1-4D89/2RJ45-DIN Logout
Configuration Password Security Keys	s/Certs
General Device Name: icdmrxpn1 TCP Keepalive: 60 s Boot Timeout: 15 s Telnet Timeout: 300 s	IP Configuration (IPv4) Use DHCP Use static configuration below: IP Address: 10.8.11.201 Subnet Mask: 255.255.0.0 Default Gateway: 10.8.0.253 NOTE: Changing these options will cause the gateway to reboot.
	Save
	© Pepperl+Fuchs Comtrol, Inc.

Network Configuration	Network Configuration Page						
General							
Device Name	You can enter a 16-character Device Name to identify this ICDM-RX/PN1 on the Home page.						
TCP Keepalive Default = 60	The TCP protocol has a keepalive feature where the two network stacks periodically ping each other to make sure the connection is still up. Upon loss of a TCP/IP connection, the network stack starts a timer. If the TCP/IP connection is still lost after the number of seconds set by the TCP Keepalive value, then the ICDM-RX/PN1 closes the connection and frees all the ports associated with the connection. If the ICDM-RX/PN1 was the originator of the first connection, it will then try to re-connect the TCP/IP connection. This allows the ICDM- RX/PN1 to be connected and ready to send/receive data even after a network disturbance. For most networks the default value should not need to be changed.						
Boot Timeout Default = 15	Allows you to change the bootloader time-out value before the default application, PN1 (PROFINET to Modbus) loads. You may need to increase this time-out value to 45 for compatibility with spanning tree devices (normally switches). If you change the time-out value to 0, this prevents PN1 firmware from loading.						
Telnet Timeout	Allows you to change the telnet time-out value before telnet times out. You may need to increase this time-out value to 45 for compatibility with spanning tree devices (normally switches). If you change the time-out value to 0, this prevents the firmware from loading.						

Network Configuration Page (Continued)						
IP Configuration (IPv4	•)					
Use DHCP	Configures the ICDM-RX/PN1 to use DHCPv4 mode. If you select Use DHCP, the IPv4 Address field below is disabled and set to 0.0.0. See your System Administrator to acquire a unique reserved IPv4 address if you are using DHCP. They will need the MAC address of the unit to provide you with an IPv4 address.					
Use static configuration below	Configures the ICDM-RX/PN1 with the static IPv4 address information that you provide in the IPv4 Address, IPv4 Netmask, and IPv4 Gateway fields below. The ICDM-RX/EN is shipped from the factory with the following default IPv4 network settings: IPv4 address = 192.168.250.250 IPv4 Netmask = 255.255.0.0 IPv4 Gateway address = 192.168.250.1					

6.2 Password Menu



Use the following information to configure a password for this ICDM-RX/PN1.



Note

There is not password set from the factory.

- 1. Click Network | Password.
- 2. If changing an existing password, enter that password in the Old Password field.
- 3. Enter a new password and enter the confirmation password.

	OL Hom	e Serial	Modbus Network	Data Mapping	Diagnostics	System		Logout
Configuration	Password	Security	Keys/Certs					
Password	Configura	ation						
Old Passwo	ord:							
New Passw Confirm Ne	ord: w Password:							
			Save					
							© Pennerl+Fuchs Co	mtrol Inc

4. Click the Save button.

When anyone attempts to log into the ICDM-RX/PN1, you must enter the following:

- admin for the username
- · The configured password for the password



6.3 Security Page

The following table discusses the Security Settings page options.

	Home	e Serial	Modbus	Network	Data Mapping	Diagnostics	System		Logout
Configuration Pass	sword	Security	Keys/Ce	rts	<i></i>				
Security Settin	gs								
Enable Secure Co	onfig Mo	de:							
Enable Telnet/ssh	n:		\checkmark						
Enable SNMP:			\checkmark						
Minimum Allowed	SSL/TL	S Version:	SSLv3.0	~					
				Save					
							_		
								© PepperI+Fuchs Cor	ntrol, Inc

Security Settings Options	
Enable Secure Config Mode	 If Secure Config mode is enabled, unencrypted access to administrative and diagnostic functions is disabled. Secure Config mode changes ICDM-RX/PN1 behavior as follows: Telnet access to administrative and diagnostic functions is disabled. SSH access is still allowed.
	 Unencrypted access to the web server via port 80 (http:// URLs) is disabled. Encrypted access to the web server via port 443 (https:// URLs) is still allowed.
	 Administrative commands that change configuration or operating state that are received using the Pepperl+Fuchs MAC mode proprietary Ethernet protocol number 0x11FE are ignored.
Enable Telnet/ssh (Default = Enabled)	This option enables or disables the telnet security feature after you click Save and the ICDM-RX/PN1 has been rebooted.
Enable SNMP (Default = Enabled)	This option enables or disables the SNMP security feature after you click Save and the ICDM-RX/PN1 has been rebooted.
Minimum Allowed SSL/TLS Version	You can select the appropriate version for your environment. SSLv3.0 TLSv1.0 (default) TLSv1.1 TLSv1.2



Use the following steps to change security settings in the ICDM-RX/PN1.

- 1. Click the Network I Security.
- 2. Click the appropriate check boxes in the **Security Settings** page to enable or disable security accordingly.
- 3. After making changes, you must click **Save**.
- 4. You may need to configure security keys or certificates depending on your choices.



6.4 Keys/Certs Page

The Key and Certificate Management page is discussed in the following table.

	OL Ho	me Seri	al Modbus	Network	Data Mapping	Diagnostics	System		Logout
Configuration	Password	d Securi	ty Keys/Ce	erts					
Key and C	ertificate	e Mana	gement						
RSA Key p RSA Serve DH Key pai	air used by r Certificate ir used by S	SSL and e used by SL serve	SSH servers SSL servers 's:	: Factory : Factory Factory	Browse Delete Browse Delete				
Note Key and certi Files must be	ficate chan in DER form	ges will t a nat.	ake effect af	fter a rebo	ot.	Save			
The RSA key the identity o clients will be from the web	and RSA ce f the serve unable to a browser an	rtificate a r. If you u authentic id other S	are used tog Ipdate one v ate the serv ISL clients.	ether by c vithout upo er and you	lients to authent Jating the other, 1 will receive war	icate nings			
								© Pepperl+Fuchs Co	ntrol, Inc.

Key and Certificate Ma	anagement Options
RSA Key pair used by SSL and SSH servers	 This is a private/public key pair that is used for two purposes: It is used by some cipher suites to encrypt the SSL/TLS handshaking messages. Possession of the private portion of this key pair allows an eavesdropper to both decrypt traffic on SSL/TLS connections that use RSA encryption during handshaking.
	 It is used to sign the Server RSA Certificate in order to verify that the ICDM-RX/PN1 is authorized to use the server RSA identity certificate.
	Possession of the private portion of this key pair allows somebody to pose as the ICDM-RX/PN1. If the Server RSA Key is to be replaced, a corresponding RSA identity certificate must also be generated and uploaded or clients are not able to verify the identity certificate.
RSA Server Certificate used by SSL servers	This is the RSA identity certificate that the ICDM-RX/PN1 uses during SSL/TLS handshaking to identify itself. It is used most frequently by SSL server code in the ICDM-RX/PN1 when clients open connections to the ICDM-RX/PN1 secure web server or other secure TCP ports. If an ICDM-RX/PN1 serial port configuration is set up to open (as a client) a TCP connection to another server device, the ICDM-RX/PN1 also uses this certificate to identify itself as an SSL client if requested by the server. In order to function properly, this certificate must be signed using the Server RSA Key. This means that the server RSA certificate and server RSA key must be replaced as a pair.

Key and Certificate Management Options (Continued)						
DH Key pair used by SSL servers	This is a private/public key pair that is used by some cipher suites to encrypt the SSL/TLS handshaking messages. Possession of the private portion of the key pair allows an eavesdropper to decrypt traffic on SSL/TLS connections that use DH encryption during handshaking					
Client Authentication Certificate used by SSL servers	If configured with a CA certificate, the ICDM-RX/PN1 requires all SSL/TLS clients to present an RSA identity certificate that has been signed by the configured CA certificate. As shipped, the ICDM-RX/PN1 is not configured with a CA certificate and all SSL/TLS clients are allowed. See <i>Client Authentication</i> (below) for more detailed information.					



Note

All ICDM-RX/PN1 units are shipped from the factory with identical configurations. They all have the identical, self-signed, Pepperl+Fuchs Server RSA Certificates, Server RSA Keys, Server DH Keys, and no Client Authentication Certificates.

For maximum data and access security, you should configure all ICDM-RX/PN1 units with custom certificates and keys.

6.4.1 Client Authentication

If desired, controlled access to SSL/TLS protected features can be configured by uploading a client authentication certificate to the ICDM-RX/PN1. By default, the ICDM-RX/PN1 is shipped without a CA (Certificate Authority) and therefore allows connections from any SSL/TLS client.

If a CA certificate is uploaded, the ICDM-RX/PN1 only allows SSL/TLS connections from client applications that provide to the ICDM-RX/PN1 an identity certificate that has been signed by the CA certificate that was uploaded to the ICDM-RX/PN1.

This uploaded CA certificate that is used to validate a client's identity is sometimes referred to as a trusted root certificate, a trusted authority certificate, or a trusted CA certificate. This CA certificate might be that of a trusted commercial certificate authority or it may be a privately generated certificate that an organization creates internally to provide a mechanism to control access to resources that are protected by the SSL/TLS protocols.

To control access to the ICDM-RX/PN1 SSL/TLS protected resources you should create your own custom CA certificate and then configure authorized client applications with identity certificates signed by the custom CA certificate.

6.4.2 Changing Keys and Certificates



Use the following steps to update security keys and certificates in the ICDM-RX/PN1.

- 1. Click Network | Keys/Cert.
- 2. Click **Browse** to locate the key or certificate file, highlight the file, and click **Open**. Refer to *Keys/Certs Page* (Page 42) for detailed information.
- Click Upload when you return to the Key and Certificate Management area. The key or certificate notation changes from factory or none to User when the ICDM-RX/PN1 is secure.
- 4. Changes will not take effect until the ICDM-RX/PN1 is rebooted.
- 5. Click System I Reboot to reboot the ICDM-RX/PN1.



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7 Data Mapping Menus

Modbus to Modbus Configuration Page



7.1

Use this page to configure Modbus to Modbus communications.

- 1. Open the ICDM-RX/PN1 web interface using your browser.
- 2. Click Data Mapping I Modbus to Modbus to open the Modbus to Modbus Configuration page.
- 3. Click the Add Default Configuration button.

Modbus to Modbus	Configuration Page
Line	 This is the configuration line number. If the configuration entry has been saved, the line number is not directly modifiable.
	• If the configuration entry is in the process of being added and has not been saved, then the line number can be set to anywhere in the configuration list.
	 The placement of the entry in the saved list is in relation to the current list of saved entries. For example, if you wish to place an entry before the current 4th entry, then enter 4 for the line number.
	 If more than one entry is added at one time, the order is pre- served but final line numbers may or may not be the same as the selected numbers.
Active	If selected, the configuration becomes active when the Save button is clicked. The Data Mapping process immediately begins to perform the configured operations. If not selected, the configuration becomes inactive when the Save button is clicked. The Data Mapping process then ignores the configured operations.
Modbus (Read)	
Device ID	The Modbus Device ID to be read.If access to the Shared Memory is desired:
	 The Shared Memory must be enabled. The Shared Memory device ID must be entered. If a Device ID for a Modbus slave is entered, the ICDM-RX/PN1 gateway routes the message to the appropriate location.
Function Code	Select the Modbus Read function code: • 01: Coil Status (00x) - read one or more coils
	02: Input Status (10x) – read one or more discrete inputs
	• 03: Holding Registers (40x) - read one or more holding registers
	04: Input Registers (30x) – read one or more input registers
Address (Base 1)	Enter the Modbus address in Base 1 format. (The address of the tables starts at 1, instead of 0 for Base 0). Enter only the lower 16 bits of the address (1-65536).
Length (Regs/Coils)	Enter the number of registers or coils to be read.

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Modbus to Modbus	Configuration Page (Continued)
Poll Rate (ms)	Enter the rate at which the Data Mapping process should read the configured Modbus device or Shared Memory.
Modbus (Write)	
Change of State	If selected, the Data Mapping process only writes the received data to the write Modbus Device if:The data is being received for the first time.
	The received data has changed.
	The previous write attempt to the write Modbus Device was unsuccessful.
Device ID	The Modbus Device ID to be written to.If access to the Shared Memory is desired:
	 The Shared Memory must be enabled. The Shared Memory device ID must be entered. If a Device ID for a Modbus slave is entered, the ICDM-RX/PN1 gateway routes the message to the appropriate location.
Function Code	Select the Modbus Write function code: • 05: Single Coil (10x) - write one coil
	06: Single Register (40x) – write one holding register
	 15: Multiple Coils (30x) – write one or more coils
	16: Multiple Registers (40x) – write one or more holding registers
Address (Base 1)	Enter the Modbus address in Base 1 format. (The address of the tables starts at 1, instead of 0 for Base 0). Enter only the lower 16 bits of the address (1-65536).
Length (Regs/Coils)	Enter the number of registers or coils to be written.
Functions	
Save	When this button is clicked:The settings are verified.
	Any changes are saved.
	 The Data Mapping process immediately is reconfigured and begins performing the configured operations.
Delete	If selected, the entry is deleted from the list when Save is selected.
Delete All	If selected, the entire list will be deleted when Save is selected.
Add Default Configuration	Adds a default entry to the end of the list. The entry will not become active until it is saved by clicking Save .
Clone Line	Add a new configuration entry to the end of the list that is identical to the entered line number. The entry will not become active until it is saved by clicking Save . Note that no action will be taken if the entered line number is invalid.
Sort By (Read Device ID)	Reorders the list based on the Read Device ID when Save is selected.
Sort By (Write Device ID)	Reorders the list based on the Write Device ID when Save is selected.

7.2 Shared Memory Configuration Page

The Shared Memory functionality enables multiple methods for communicating between a wide variety of controllers, Modbus masters and Modbus slave devices.

- The Shared Memory interface contains eight 200 Holding Register blocks and eight 320 Coil blocks.
- All Modbus masters, (Modbus/TCP, serial Modbus RTU/ASCII, and Modbus RTU/ASCII over Ethernet TCP/IP), can read the contents of the Shared Memory blocks.
- Data Mapping configurations can read Shared Memory blocks.
- Write access can be controlled to each Holding Register and Coil block. Each block can be can be restricted to:
 - A port-specific serial master
 - A Modbus/TCP master
 - Modbus Object message(s)
 - Tag/File to Modbus Data Mapping configuration(s).
 - Modbus to Modbus Data Mapping configuration(s)
- The Shared Memory contents can be displayed and cleared via the web pages.
- Diagnostics for each block include read, write and blocked write message counts.
- Blocked write messages are recorded in the Write Violation Log.

This table displays the supported Holding Register Block Function Codes:

Function Code	Description
3	Read Holding Registers
4	Read Input Registers
6	Write Single Register
16	Write Multiple Registers
22	Write Mask Register
23	Read Write Registers

This table shows the supported Coil Block Function Codes:

Function Code	Description
1	Read Coils
2	Read Discrete Input
5	Write Single Coil
15	Write Multiple Coils



Click Data Mapping | Shared Memory to open the Shared Memory Configuration page.

	Memory Co	inigui	ration												
Enable	Shared Memory	Y													
Shared	Memory Device	ID	-	252											
Holding	Register Start	Addres	ss (Base	1) 400	001										
	teldine peele	is (Dasi	e 1)	1											
Block	Address Ran	ige	Accept Broadca Message	t PNI Ist Rea Es Enal	Disable D Mapping W d On Los ble PNIO Re Connecti	ata rites [t ad	Clear Data On Lost PNIO	Write Master(s)		Serial Port , IP Address	,	Description			
1	400001-4002	200		P				All (Except PROFINET IO) 🗸	-			200 read write holding	re D		
2	400201-4004	100			1			All (Except PROFINET IO) ~		All (Except PROFINET IO) V				200 read write holding	re D
3	400401-4006	500						PROFINET IO ~				200 read write holding	re D		
4	400601-4008	300						PROFINET IO	-			200 read write holding	re D		
5	400801-4010	000						All (Except PROFINET IO) 🗸	-			200 read write holding	re D		
6	401001-4012	200						All (Except PROFINET IO) 🗸	-			200 read write holding	re D		
7	401201-4014	100]			All (Except PROFINET IO) 🗸				200 read write holding	re D		
8	401401-4016	500						All (Except PROFINET IO) 🗸	~			200 read write holding	re D		
hared (Block	Coils Coil Range	Ac Broa Mes	cept adcast sages	PNIO Read Enable	Disable Data Mapping Writes On Lost PNIO Read Connection	Clea Data Los PNI Connec	ar On et O ction	Write Master(s)	s 1	erial Port / IP Address		Description			
1	1-320						4	All (Except PROFINET IO) 🗸			3	20 read write coils	Display		
2	321-640			\square			/	All (Except PROFINET IO) 🗸			3	20 read write coils	Display		
3	641-960	1					F	ROFINET IO V			3	20 read write coils	Display		
4	961-1280						F	PROFINET IO			3	20 read write coils	Display		
5	1281-1600						4	All (Except PROFINET IO) $\!$			3	20 read write coils	Display		
6	1601-1920						/	All (Except PROFINET IO) \lor			3	20 read write coils	Display		
7	1921-2240	1					4	All (Except PROFINET IO) 🗸			3	20 read write coils	Display		
8	2241-2560						1	All (Except PROFINET IO) 🗸			3	20 read write coils	Display		

The following table provides details about the configuration options. Click the **Display** button to view detailed information about a specific block or coil.

Shared Memory Config	guration Page								
Enable Shared Memory (Default = Off)	If selected, enables the Shared Memory functionality.								
Shared Memory Device ID (Default = 252)	The Device ID (also often called the unit ID) of the Shared Memory must be unique within the public Modbus network. The Device ID range is 1 to 255.								
Holding Register Start Address (Base 1) (Default = 400001)	Specifies the starting address of the Shared Memory Holding Register blocks. The range is 400001 to 463935.								
Coil Block Start Address (Base 1) (Default = 1)	Specifies the starting address of the Shared Memory Coil blocks. The range is 1 to 64255.								
Shared Holding Registers									
Block	Specifies the block number.								
Address Range	Specifies the block address range.								

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Shared Memory Confi	guration Page (Continued)
Accept Broadcast Messages (Default = Disabled)	If selected, the Shared Memory block(s) will accept broadcast messages addressed to their memory block(s).
PNIO Read Enable	If selected, the Shared Memory block is added to the PROFINET IO configuration.
Disable Data Mapping Writes On Lost PNIO Read Connection (Default = Disabled)	If selected, the Data Mapping process performs writes to this Shared Memory block only when there is an active PROFINET IO read connection to this block.
Clear Data On Lost PNIO Connection (Default = Disabled)	If selected, the Shared Memory block's data are cleared when all PROFINET IO connections to this block are lost.
Write Master(s) [Defaults: Block 3 and 4: PROFINET IO Other blocks: All (Except PROFINET IO)]	 Indicates which master(s) have write access to the Shared Memory block. All (Except PROFINET IO) – Except for PROFINET IO connections, all Modbus masters, Modbus Object and Data Mapping functions have write access to the block.
	 Port specific serial master: Port-1 Port-2 (2-port and 4-port models only) Port-3 (4-port models only) Port-4 (4-port models only) Modbus/TCP - Modbus/TCP master(s) at a specified IP address.
	 Ethernet TCP/IP – Ethernet TCP/IP master(s) at a specified IP address. PROFINET IO – PROFINET IO connection. Only one PROFINET IO connection can access the block at one time. Modbus to Modbus – Modbus to Modbus configuration(s).
Serial Port / IP Address (Default = blank)	IP address of the Modbus/TCP master, Ethernet TCP/IP master or PROFINET IO controller. Zeros indicate that there is no configuration. This does not apply to All (PROFINET IO), port-specific serial masters, PROFINET IO, or Modbus to Modbus configuration(s)
Description (Default = 200 read write holding registers)	User-defined description of the Shared Memory block. ASCII string with a maximum of 80 characters in length.
Shared Coils	
Block	Specifies the block number.
Coil Range	Specifies the coil range.
Accept Broadcast Messages (Default = Disabled)	If selected, the Shared Coil(s) accept broadcast messages from Modbus masters addressed to their memory block(s).
PNIO Read Enable	If selected, the Shared Coil is added to the PROFINET IO configuration.
Disable Data Mapping Writes On Lost PNIO Read Connection (Default = Disabled)	If selected, the Data Mapping process performs writes to this Shared Coil only when there is an active PROFINET IO read connection to this coil.
Clear Data On Lost PNIO Connection (Default = Disabled)	If selected, the Shared coil's data are cleared when all PROFINET IO connections to this coil are lost.



Shared Memory Confi	guration Page (Continued)
Write Master(s) [Defaults: Coil 3 and 4: PROFINET IO Other Coil: All (Except PROFINET IO)]	 Indicates which master(s) have write access to the Shared Coil. All (Except PROFINET IO) – Except for PROFINET IO connections, all Modbus masters, Modbus Object and Data Mapping functions have write access to the coil. Port specific serial master: Port-1 Port-2 (2-port and 4-port models only)
	 Port-3 (4-port models only) Port-4 (4-port models only) Modbus/TCP - Modbus/TCP master(s) at a specified IP address.
	 Ethernet TCP/IP – Ethernet TCP/IP master(s) at a specified IP address.
	 PROFINET IO – PROFINET IO connection. Only one PROFINET IO connection can access the coil at one time.
	 Modbus to Modbus – Modbus to Modbus configuration(s).
Serial Port / IP Address (Default = blank)	IP address of the Modbus/TCP master, Ethernet TCP/IP master or PROFINET IO controller. Zeros indicate that there is no configuration. <i>This does not apply to All (Except PROFINET IO), port-specific serial masters, PROFINET IO, or Modbus to Modbus configuration(s)</i>
Description (Default = 200 read write holding registers)	User-defined description of the Shared Coil. ASCII string with a maximum of 80 characters in length.

7.3 Data Mapping Verification Page

The Verify Data Mapping page is used to check for the following configuration problems.

Configuration Issue	Description
Write conflicts to PROFINET IO PLCs	This occurs when two or more Data Mapping configurations can write to the same PLC tag or File locations.
Write conflicts to Modus devices	This occurs when two or more Data Mapping configurations can write to the same Modbus device address.
Write to Shared Memory conflicts	This occurs when two or more Data Mapping configurations can write to the same Shared Memory address.
Invalid Shared Memory Addresses	This occurs when Data Mapping configuration can write to an invalid Shared Memory address.
Shared Memory block write protection violations	This occurs when a Data Mapping configuration can write to a Shared Memory address that is write- protected and there is no write access allowed.

Access the **Data Mapping Verification** page by clicking **Data Mapping I Verify Data Mapping**. The following page indicates that the are no conflicts or violations detected.

	Home Serial M	lodbus Network	Data Mapping	Diagnostics	System	ICDM-RX/PN1-4DB9/2RJ45-DIN	Logout
Modbus to Modbus	Shared Memory	Verify Data Mappin	g Shared Me	mory Map			
Data Mapping Ve	erification	ice conflicts detecte					
Shared memory is n	ot enabled. No ac	cess allowed to shar	red memory.				
						© Pepperl+Fuchs Co	mtrol, Inc.

The following page demonstrates what is displayed when there are multiple conflicts with the Data Mapping configurations.

- A write to PROFINET IO PLC conflict. Two configurations are writing to the same tag. Conflicting settings are highlighted in red.
- Two configuration are writing to the same address on a Modbus device.
- There are two separate conflicts writing to the same Shared Memory addresses. Conflicting settings are highlighted in red.

	ITRO	L H		rial Modbus Network Da	ıta Mappinç	Diagnostics				
Modbus	to Moc	Ibus Sh	ared Mer	mory Verify Data Mapping	Shared Mr	emory Map				
Data M	lappir	ng Veri	ificatio	n						
No data r	mappin	g write t	o Modbu	s device conflicts detected.						
Data mar	ping v	rite to S	hared Mi	emory conflicts detected:						
		1	_	Modbus (Per	ad)			Modbus (Write)		
Conflict Num	Line	Active	Device ID	Function Code	Address (Base 1)	Length (Regs/Coils)	Device ID	Function Code	Address (Base 1)	
1	1	yes	50	03: Holding Registers (40x)	1	50	252	16: Multiple Registers (40x)	201	
1	2	yes	51	03: Holding Registers (40x)	1	50	252	16: Multiple Registers (40x)	201	
2	з	yes	1	01: Coil Status (00x)	41	10	252	15: Multiple Coils (10x)	23	
2	4	yes	2	03: Holding Registers (40x)	12	15	252	15: Multiple Coils (10x)	23	
No data r	mappin	g invalid	Shared M	vemory addresses detected.			-			



7.4 Shared Memory Map Page

The **Shared Memory Map** page is provided to show the Built-in Configuration and PROFINET IO access to each Shared Memory block. Write conflicts are shown highlighted in red as shown in the second image.

_			·	nory map	ared Men	oing Sn	ata Mapp	verity D	iemory	Snared M	odbus	lodbus to M
^								ry Map	Memo	hared	ping S	ata Map
	ers	holding registers	ad write	200 re	iption:	Descr	ess 🗸	Write Acc	1 🗸	ster Block	ding Regis	Shared Hole
		+0	+9	+7	+6	+5	+4	+3	+2	+1	+0	Addrocc
		.,	10	.,	10	1.5		13	12	MM1	MM1	400001
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2		400011
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400021
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400031
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400041
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400051
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400061
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400071
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400081
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400091
		MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	400101
									MM2	MM2	MM2	400111
												400121
												400131
												400141
												400151
												400161
												400171
												400181
												400191

ubus to k	lodbus Shari	ed Memory \	/enty Data Ma	pping Shared	i Memory Map						
ata Map	ping Share	d Memory	Мар								
Shared Hold	ding Register Blo	ck 2 🔻 🛛 Wi	rite Access 💌	Description	1: 200 read	write holding	registers				
Address	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	
400201	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	
400211	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	
400221	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	MM1	
400231	MM1	MM1	MM1	MM1	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	
400241	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	MM1,MM2	
400251	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	
400261	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	
400271	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	
400281	MM2	MM2	MM2	MM2							
400291											
400301											
400311											
400321											
400331											
400341											
400351											
400361											
400371											
100381											
400391											

Access the **Data Mapping Shared Memory Map** page by clicking **Data Mapping I Shared Memory Map**.

- 1. Select the shared holding register or coil block that you want to review.
- 2. Select Write Access or Read Access.

lodbus to M	odbus	Shared Me	mory	Verify D	ata Mapi	oing Sh	ared Mer	nory Mar				
	• •		,	,.		<u> </u>		,	_			
ata Map	ping S	hared M	emo	гу Мар								^
Shared Hole	ding Regis	ster Block 1	3	Write Acc	cess 🗸	Descr	iption:	200 re	ad write	holding	registers	
Shared Hold	ling Regis	ster Block 2	15									
Shared Hold	ting Regis	ster Block 3		-	-		-	_				
Shared Hole	ling Regis	ster Block 5	2	+3	+4	+5	+6	+/	+8	+9		
Shared Hold	ling Regis	ster Block 6	40	MMO	MMO	MMO	MMO	MMO	MMO	MMO		
Shared Hold	ting Regis	ster Block 8	12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coil	Block 1		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coil	Block 2		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coll Shared Coll	Block 3 Block 4		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coil	Block 5		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coil	Block 6		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
Shared Coil Shared Coil	Block / Block 8		12	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
400091	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
400101	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2	MM2		
400111	MM2	MM2	MM2									
400121												
400131												
400141												
400151												
400161												
400171												
400181												
400191												
ote: MM = I	1odbus t	o Modbus;	PNIO	= PROFIN	NET IO							\sim

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8 Diagnostics Menus

8.1 Serial Communication Statistics

The default **Diagnostics** menu page is the **Serial Communication Statistics** page.

COMTROL Home Serial Modbus	Network Data I	Mapping	Diagnostics	System	ICDM-RX/PN1-4DB9/2RJ45-DIN	Logout
Communication Modbus Diagnostics PRO	FINET IO Diagnosti	cs Data M	lapping Diag	nostics Sy	stem Log	
Serial Statistics TCP Statistics Serial Log	js					
Serial Communication Statistics						-
Serial Interface Statistics	Port 1	Port 2	Port 3	Port 4		
TX Byte Count (To Device):	137960	30632	119344	33304		
TX Message/Response Count:	17245	3829	14918	4163		
RX Byte Count (From Device):	951894	247065	385000	269008		
RX Message/Response Count:	17206	3801	5916	4138		
Tx or Rx Broadcast Message Count:	0	0	0	0		
Master/Slaves Private Messages:	N/A	N/A	N/A	N/A		
Parity Error Count:	0	0	0	0		
Framing Error Count:	0	0	0	0		
Overrun error count:	0	0	0	0		
Dropped Message/Response Count:	0	0	0	0		
Invalid Modbus Message/Response	Count: 1	0	0	3		
Device Timeouts:	35	21	9001	21		
Blocked Write Messages:	0	0	0	0		
					© Pepperl+Fuchs Co	mtrol. Inc.

The following table provides detailed information about the **Serial Communication Statistics** page.

Serial Communication Stat	istics Page
TX Byte Count (To Device)	Displays the number of bytes transmitted out the serial port.
TX Message/Response Count	Displays the number of messages or responses transmitted out of the serial port.
RX Byte Count (From Device)	Displays the number of bytes received on the serial port.
RX Message/Response Count	Displays the number of messages or responses received on the serial port.
Tx or Rx Broadcast Message Count	Displays the number of broadcast messages transmitted out the serial port.
Master/Slaves Private Messages	Displays the number of private messages detected, those between a master and private slave(s), on a serial port configured in Master/Slaves mode.
Parity Error Count	Displays the number of parity errors received on the serial port. Typically occurs due to an incorrect parity setting.
Framing Error Count	Displays the number of framing errors received on the serial port. Typically occurs due to an incorrect baud rate or stop bit setting.
Overrun Error Count	Displays the number of overrun errors received on the serial port. This typically occurs to one of the following events: incorrect flow control, incorrect baud rate, incorrect data size, or incorrect stop bit setting.
Dropped Message/Response Count	Displays the number of messages or responses dropped to any of the following: Incomplete message or response.
	 Did not receive valid start and/or end characters (Modbus/ASCII only).

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Serial Communication Statistics Page (Continued)					
Invalid Modbus Message/Response Count	 Displays the number of invalid messages or responses received to any of the following events: Message received after the timeout period. This may require increasing the Device Response Timeout. 				
	Incorrect device ID in response message.				
	 Incorrect function code in response message. 				
Device Timeouts	Displays the number of device timeouts that occurred when there was no response for a Modbus message.				
Blocked Write Messages	Displays the number of Modbus write messages that were not transmitted as a result of the Disable Writes (Read Only) option being set.				

8.2

Modbus RTU/ASCII over Ethernet TCP Statistics Page

Click Diagnostics | Communication | TCP Statistics to access the Modbus RTU/ASCII over Ethernet TCP Statistics page.

mmunication Modbus Diagnostics PROFINET IO	Diagnostics Data Map	ping Diagnostics	System Log	
rial Statistics TCP Statistics Serial Logs				
odbus RTU/ASCII over Ethernet TCP Stat	istics			
Reset Statistics				
Ethernet TCP/IP Interface Statistics	Socket 1	Socket 2	Socket 3	Socket 4
TX Byte Count (To Application):	522420	6500	23270	980995
TX Response Count:	8040	100	358	15095
Dropped TX Responses:	0	0	0	0
RX Byte Count (From Application):	64336	800	2864	120760
RX Message Count:	8042	100	358	15095
Dropped RX Messages Due to Congestion:	0	0	0	0
Dropped Invalid or Incomplete RX Messages:	0	0	0	0
Dropped RX Messages Due To Invalid CRCs:	0	0	0	0
Remote Connection Status:	10.8.40.11:56924	(no connection)	(no connection)	10.8.40.11:56957

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This table provides information about the **Modbus RTU/ASCII over Ethernet TCP Statistics** page.

Modbus RTU/ASCII over E	Ethernet TCP Statistics Page
TX Byte Count (To Application)	The number of bytes transmitted out of the TCP/IP connection(s).
TX Response Count	The number of responses transmitted out of the TCP/IP connection(s).
Dropped TX Responses	The number of responses that were intended to be transmitted out the TCP/IP connection(s) but could not be and were dropped. This typically occurs when one or more connections close unexpectedly.
RX Byte Count (From Application)	The number of bytes received on the TCP/IP connection(s).
RX Message Count	The number of messages received on the TCP/IP connection(s).
Dropped RX Messages Due to Congestion	The number of messages that were dropped to the gateway being overly congested. This typically occurs when the application(s) send messages faster than the slave device(s) can respond.

Modbus RTU/ASCII over Ethernet TCP Statistics Page				
Dropped Invalid or Incomplete RX Messages	The number of messages from the application(s) that were dropped to:Containing an invalid Modbus message format.			
	Containing an incomplete Modbus message.			
Dropped RX Messages Due to Invalid CRCs	The number of messages from the application(s) that were dropped due to an invalid Modbus/RTU CRC or Modbus/ASCII LRC.			
Remote Connection Status	Displays remote TCP/IP connections.			

8.3 Serial Interface Logs Page

Access the Serial Interface Logs page by clicking Diagnostics | Communication | Serial Logs.

The **Serial Interface Logs** page provides a log of received and transmitted serial port messages. Up to 512 bytes per message and up to 32 messages are logged. It is intended to help with debugging serial connectivity problems, determining the proper start and end of transmission bytes, and diagnosing device problems.

The format is as follows:

Pkt(n): ddd:hh:mm:ss.ms Tx/Rx:<Data>

Where:

ddd - days since last system restart

hh - hours since last system restart

ms - minutes since last system restart

 ${\tt ss}$ – seconds since last system restart

mm - milliseconds since last system restart

<Data> - Data packet received.

- For Modbus slave data, all data bytes shown in hex (xxh) format.
- For Raw/ASCII and Modbus/ASCII data
- ASCII characters displayed as characters
- Non-ASCII displayed in hex (xxh) format

COM Propert-Fachs	TROL Home Ser	ial Modbu	us Network Data Mapping Diagnostics Sys	tem ICDM-RX/PN1-4DB9/2RJ45-DIN	Logou
ommuni	cation Modbus Diagnos	stics PROF	FINET IO Diagnostics Data Mapping Diagnostic	s System Log	
erial Sta	atistics TCP Statistics	Serial L	ogs		
erial I	nterface Logs				
Reset L	.og Refresh				
-	D. /T. D. L. L. /C. L	12 nackote	may of E12 butoc)		
Port 1	RX/TX Packets (first a	2 packets	, max of 512 bytes).		
Port 1 Pkt	ddd hh:mm:ss:ms	Tx/Rx	Data	Ê.	
Port 1 Pkt 1	ddd hh:mm:ss:ms 049 17:40:53.181	Tx/Rx	Data (57h)(03h)(00h)(0Dh)(00h)(02h)(59h)(FEh)		
Port 1 Pkt 1 2	ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183	Tx/Rx Tx Tx	Data (57h)(03h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(05h)(89h)(33h)		
Port 1 Pkt 1 2 3	ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187	Tx/Rx Tx Tx Tx Tx	Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h)		
Port 1 Pkt 1 2 3 4	ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187 049 17:40:56.199	Tx/Rx Tx Tx Tx Tx Tx Tx	Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh)		
Port 1 Pkt 1 2 3 4 5	Access (nrst 3 ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187 049 17:40:55.187 049 17:40:55.207	Tx/Rx Tx Tx Tx Tx Tx Tx Tx Tx	, max or 512 bytes). Data (57h)(03h)(00h)(0Dh)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h)		
Port 1 Pkt 1 2 3 4 5 6	ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187 049 17:40:55.187 049 17:40:57.207 049 17:40:58.211	Tx/Rx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx	max 0512 bytes). Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h)		
Port 1 Pkt 1 2 3 4 5 6 7	Active Content ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187 049 17:40:55.187 049 17:40:55.207 049 17:40:55.211 049 17:40:55.219	Tx/Rx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx	Data (57h)(03h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(60h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h)		
Port 1 Pkt 1 2 3 4 5 6 7 8	Active Content ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:54.183 049 17:40:55.187 049 17:40:55.187 049 17:40:55.187 049 17:40:55.207 049 17:40:57.207 049 17:40:57.201 049 17:40:57.211 049 17:40:52.219 049 17:41:00.223	Tx/Rx Tx	Data (57h)(03h)(00h)(00h)(02h)(59h)(FEh) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh)		
Port 1 Pkt 1 2 3 4 5 6 7 8 9	Kx / 1x Packets (lifst a ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:55.187 049 17:40:55.187 049 17:40:55.187 049 17:40:55.219 049 17:40:55.207 049 17:40:58.211 049 17:40:58.212 049 17:40:223 049 17:41:01.223	Tx/Rx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx Tx	, max or 512 oytes). Data (57h)(03h)(00h)(0Dh)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(00h)(05h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(58h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(06h)(69h)(38h)		
Port 1 Pkt 1 2 3 4 5 6 7 8 9 10	Active Content ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:55.187 049 17:40:55.187 049 17:40:55.187 049 17:40:55.207 049 17:40:57.207 049 17:40:57.207 049 17:40:57.207 049 17:40:59.219 049 17:41:00.223 049 17:41:01.231 049 17:41:02.245	Tx/Rx Tx Tx	max or 512 bytes). Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(00h)(00h)(05h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(62h)(59h)(FEh)		
Port 1 Pkt 1 2 3 4 5 6 7 8 9 10 11	Action Action ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:53.181 049 17:40:55.187 049 17:40:55.187 049 17:40:55.187 049 17:40:57.207 049 17:40:57.207 049 17:40:55.211 049 17:40:59.219 049 17:41:02.23 049 17:41:02.23 049 17:41:02.245 049 17:41:02.245	Tx/Rx Tx	max or 512 bytes). Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (57h)(03h)(00h)(02h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(02h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(02h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h)		
Port 1 Pkt 1 2 3 4 5 6 7 8 9 10 11 12	Kx / 1x Packets (IIFX 3 ddd hh:mm:ss:ms 049 17:40:53.181 049 17:40:55.187 049 17:40:55.187 049 17:40:55.187 049 17:40:55.207 049 17:40:55.211 049 17:40:55.211 049 17:40:52.219 049 17:41:02.223 049 17:41:02.223 049 17:41:02.245 049 17:41:02.245 049 17:41:02.246 049 17:41:02.254	Tx/Rx Tx	max or 512 bytes): Data (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(33h) (59h)(03h)(00h)(02h)(00h)(66h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (57h)(03h)(00h)(00h)(00h)(02h)(59h)(FEh) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (57h)(03h)(00h)(00h)(00h)(66h)(69h)(38h) (59h)(03h)(00h)(00h)(00h)(00h)(69h)(38h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (57h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h) (58h)(03h)(00h)(00h)(00h)(05h)(89h)(38h)		



8.4 Known Modbus Slave Device List Page

The **Known Modbus Slave Device List** page provides device specific status and statistics for each device connected locally to one or more of the serial ports or remotely through a remote Modbus/TCP device configuration.

nmunicati	on Modbus	Diagnos	tics PRO	FINET IO D	agnostics	Data Mapp	ing Diagnost	ics System	Log					
dbus Devi	ces Modbu	s/TCP Int	terface M	1odbus/TCI	o Connectio	ns Alias Di	agnostics S	hared Memo	ry					
own Mo	dbus Slave	e Device	e List											
Reset Stati	stics													
uto-Loc	ated Serial	Modbus	Devices											
ort 1 Mo	dbus/RTU Pi	ublic Sla	ve(s):											
Device	Active?	Тх	Rx	Time-	Last Rsp	Avg Rsp	Min Rsp	Max Rsp	Error	Invalid	Blocked	Tx Broad-		
ID		Regs	Resps	outs	Time	Time	Time	Time	Resps	Resps	writes	casts		
1	yes	11195	11192	4	0.03 sec	0.04 sec	0.03 sec	0.28 sec	0	1	0	0		
5	yes	3626	3624	2	0.03 sec	0.03 sec	0.02 sec	0.05 sec	0	0	0	0		
19 ort 3 Mor	yes dbuc/PTU Di	209 Iblic Ela	209	0	0.04 Sec	0.04 sec	0.03 sec	0.05 sec	0	0	0	U		
OFL 2 MO		JUIIC SIA	ve(s).		Lact	A.v.a	Min	May				Tv		
Device ID	Active?	Tx Reqs	Rx Resps	Time- outs	Rsp	Rsp	Rsp	Rsp	Error Resps	Invalid Resps	Blocked Writes	Broad-		
83	VAC	3671	3647	6	0.03 sec	0.04 sec	0.03 sec	0.06 sec	0	0	0	Casts		
ort 3 Mo	dbus/RTU P	ublic Sla	ve(s):		0.0000000	0.04 000	0.00 000	0.00 000						
Device ID	Active?	Tx Reqs	Rx Resps	Time- outs	Last Rsp Time	Avg Rsp	Min Rsp Timo	Max Rsp Timo	Error Resps	Invalid Resps	Blocked Writes	Tx Broad-		
87	00	2258	23	2128	0.03 sec	0.03 sec	0.03 sec	0.04 sec	0	1	0	0		
89	no	2263	19	2131	0.05 sec	0.05 sec	0.04 sec	0.05 sec	0	1	õ	õ		
91	no	3729	19	3597	0.03 sec	0.03 sec	0.03 sec	0.04 sec	0	1	0	0		
105	yes	899	896	0	0.03 sec	0.04 sec	0.03 sec	0.10 sec	0	0	0	0		
106	yes	3153	3150	0	0.04 sec	0.04 sec	0.03 sec	0.30 sec	0	0	0	0		
107	yes	893	890	0	0.03 sec	0.04 sec	0.03 sec	0.06 sec	0	0	0	0		
ort 4 Mo	dbus/RTU Pi	ıblic Sla	ve(s):											
Device ID	Active?	Tx Reqs	Rx Resps	Time- outs	Last Rsp Time	Avg Rsp Time	Min Rsp Time	Max Rsp Time	Error Resps	Invalid Resps	Blocked Writes	Tx Broad- casts		
197	yes	3981	3981	0	0.05 sec	0.04 sec	0.03 sec	0.28 sec	0	0	0	0		
ontigure	eu kemote l	MOODUS	Devices:											Ту
Device ID	IP Address	IP Port	Active	? Tx Reqs	Rx Resps	Time- outs	Last Rsp Time	Avg Rsp Time	Min Rsp Tim	Ma Rsp T	x Err	ps Path	Invalid Resps	Broad- casts
124	10.8.40.12	502	yes	8228	8228	0	0.11 sec	0.10 sec	0.10 se	c 0.41	sec 0	0	0	0
125	10.8.40.12	502	yes	1902	1886	15	0.11 sec	0.10 sec	0.10 se	c 0.12	sec 0	45	0	0
126	10.8.9.22	502	yes	1049	1049	0	0.11 Sec	0.10 Sec	0.02 se	c 0.13	sec 0	0	0	0
12/	10.0.9.22	302	yes	1031	1031	U	0.10 Sec	0.10 Sec	0.10 Se	0.12	sec U	U	U	U

Access the Known Modbus Slave Device List page by clicking Diagnostics | Modbus Diagnostics | Modbus Devices.

Known Modbus S	Slave Device List Page - Public Devices
Active?	 Displays the status of device: Yes means that the last request received a valid response and did not time out.
	• No means that the last request timed out or the device has not yet received a message.
IP Address	Displays the IP address associated with the local device under Configured Remote Modbus Devices.
IP Port	Displays the TCP/IP port associated with the remote device under Configured Remote Modbus Devices.
Tx Req	Displays the number of Modbus messages transmitted to this device.
Rx Rsp	Displays the number of Modbus responses received from this device.
Timeouts	Displays the number of response timeouts associated with this device.
Last Rsp Time	Displays the last response time from the Modbus device.
Avg Rsp Time	Displays the TCP/IP port associated with the remote device under Configured Remote Modbus Devices.
Tx Req	Displays the number of Modbus messages transmitted to this device.
Rx Rsp	Displays the number of Modbus responses received from this device.
Timeouts	Displays the number of response timeouts associated with this device.

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Known Modbus S	Slave Device List Page - Public Devices (Continued)
Last Rsp Time	Displays the last response time from the Modbus device.
Avg Rsp Time	Displays the average response time from the Modbus device.
Min Rsp Time	Displays the minimum response time from the Modbus device.
Max Rsp Time	Displays the maximum response time from the Modbus device.
Error Rsp	Displays the number of responses with Modbus error indications.
No Path	This displays under Configured Remote Modbus Devices the number of times the network path could not be connected. This could be a result of:
	Out of Modbus/TCP connections.
	Modbus/TCP device not responding.
	Incorrect IP address.
Invalid Responses	Displays the number of invalid messages or responses received to any of the following:
	 Message received after the timeout period. This may require increasing the Device Response Timeout.
	 Incorrect device ID in response message.
	 Incorrect function code in response message.
Blocked Writes	Displays the number of Modbus write messages that were not transmitted for this device. This only occurs when the Disable Writes (Read Only) serial port option is selected.
Tx Broadcasts	Displays the number of Modbus broadcast messages transmitted to this device.

Known Modbus	Slave Device List Page - Private Devices
Device ID	Displays the device ID associated with this device. Note that if the Device ID Offset Mode option is enabled, the actual device ID transmitted out the serial port displays as (SP=xxx).
Requests	Displays the number of private requests addressed to this Modbus device.
Responses	Displays the number of private responses from this Modbus device.
Req Or Resp?	Displays the number of private requests/responses addressed to/from this Modbus device that could not be identified specifically as either a request or a response.
No Responses	Displays the number of requests that this Modbus device did not respond to.
Last Rsp	Time Displays the last response time from the Modbus device.
Avg Rsp Time	Displays the average response time from the Modbus device.
Min Rsp Time	Displays the minimum response time from the Modbus device.
Max Rsp Time	Displays the maximum response time from the Modbus device.
Error Rsp	Displays the number of responses with Modbus error indications.



8.5 Modbus/TCP and Serial Modbus Master Statistics Page

Click **Diagnostics | Modbus Diagnostics | Modbus/TCP Interface** to access the **Modbus/TCP and Serial Modbus Master Statistics** page, which is explained in the following table.



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Note

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The Modbus/TCP interface uses the standard socket port of 502.



Modbus/TCP and Serial Modbus Master Statistics Page						
Modbus/TCP Slave Mo	ode Specific Statistics					
Active Modbus/TCP Slave Connections	Displays the current number of active Modbus/TCP slave connections. These connections were initiated by a controller to the ICDM-RX/PN1.					
Modbus/TCP Slave Connections Opened	Displays the total number of Modbus/TCP slave connections that have been opened.					
Modbus/TCP Slave Connections Closed	Displays the total number of Modbus/TCP slave connections that have been closed.					
Messages Received From Modbus/TCP Master(s)	Displays the total number of Modbus/TCP messages received from Modbus/TCP master(s).					
Responses Sent to Modbus/TCP Master(s)	Displays the total number of Modbus/TCP responses sent to Modbus/TCP master(s).					
Responses Dropped to Modbus/TCP Master						
Modbus Broadcasts Received From Modbus/TCP Master	Displays the number of Modbus broadcast messages received from Modbus/TCP Masters.					
Invalid Command Lengths	Displays the number of messages received with invalid command lengths.					
Invalid Message Data Errors	Displays the number of messages received with invalid message data errors. These errors occur when the ICDM-RX/PN1receives a message that cannot be processed due to improper message data.					
Invalid Request Protocol Types	Displays the number of messages received with invalid protocol errors. This occurs when a message is received with a protocol other than the Modbus/TCP protocol value of zero.					
Modbus/TCP Master M	Iode Specific Statistics					
Active Modbus/TCP Master Connections	Displays the current number of active Modbus/TCP master connections. These connections were initiated by the ICDM-RX/PN1 to a Modbus/TCP slave.					
Modbus/TCP Master Connections Opened	Displays the total number of Modbus/TCP master connections that have been opened.					
Modbus/TCP Master Connections Closed	Displays the total number of Modbus/TCP master connections that have been closed.					
Messages Sent To Modbus/TCP Slave(s)	Displays the total number Modbus messages sent to remote Modbus/TCP slaves.					
Responses Received From Modbus/TCP Slave(s)	Displays the total number of Modbus responses received from the Modbus/TCP Slave(s).					
Invalid Response Data Errors From Modbus/TCP Slave(s)	Displays the number of response data errors to polling requests returned from the Modbus/TCP Slave(s). Possible causes include: Incorrect transaction ID incorrect.					
	Message command length to large.					
	Incorrect device Id in response.					
Remote Modbus/TCP Device Timeouts	Displays the number of messages to remote devices that were determined to have timed out by this gateway.					
Unexpected Responses From Modbus/TCP Slave(s)	Displays the number of responses received when no response was expected.					



Modbus/TCP and Serie	al Modbus Master Statistics Page (Continued)
Error Responses from Modbus/TCP Slave(s)	 Displays the number of responses received from Modbus/TCP slaves with errors indicated. This may be caused by such things as: Device timeouts detected by slave Modbus/TCP device, such a gateway.
	Invalid device address.
	Invalid device ID.
	Invalid message data.
Unexpected Response Function Codes From Modbus/TCP Slave(s)	Displays the number of unexpected response function codes from Modbus/TCP slaves. This occurs when a response was received with a different function code than what was sent.
Invalid Response Protocol Types From Modbus/TCP Slave(s)	Displays the number of responses with invalid protocol errors. This occurs when a response is returned with a protocol other than the Modbus/TCP protocol value of zero.
Failed Modbus/TCP Connection Attempts to Modbus/TCP Slave(s)	Displays the number of failed Modbus/TCP connection attempts to the specified PLC IP address.
Modbus/TCP Connection Problems	 Displays the number of Modbus/TCP connection attempt problems. This occurs when the device responds and the connection is made, but there are problems setting up the connection options. The possible option problems include: Setting the TCP connection to TCP_NODELAY. Setting the socket connection to SO OOBINLINE.
	 Setting the socket connection to SO_KEEPALIVE.
Unexpected Dropped Connections	Displays the number of Modbus/TCP connections that were unexpectedly dropped.
Non-Mode Specific Sta	atistics/Diagnostics
No Available Modbus/TCP Connection Errors	Displays the number of connections aborted when there are no available Modbus/TCP connections. This error occurs when the maximum number of Modbus/TCP connections has been reached and the ICDM-RX/PN1 is attempting to form another Modbus/TCP connection.
Improper Configuration Errors	Displays the number of errors that were caused by improper configuration errors.
System Resource Errors	Displays the numbers of system resource errors. These errors are typically caused by congestion and/or non-responding devices.
First Error Description	Displays the first error detected.
Last Error Description	Displays the last or most recent error detected.

8.6 Modbus/TCP Connections Page

Access the **Modbus/TCP Connections** page by clicking Diagnostics | Modbus Diagnostics | Modbus/TCP Connections.



Modbus/TCP Connections Page						
Slave Mode (From Master) Modbus/TCP Connections <i>Note</i> : Only displayed if active connections.						
Remote Connection	The Modbus/TCP master connection in IP Address:Port Number format (xxx.xxx.xxx.xxx:pppp).					
Local IP Port	The local TCP/IP port on the ICDM-RX/PN1. The standard Modbus/TCP port of 502 is always enabled. Optionally, up to seven additional Modbus/TCP ports may also be enabled.					
Rx Requests	Displays the number of Modbus requests that have been received since the connection was opened.					
Tx Responses	Displays the number of Modbus responses that have been transmitted since the connection was opened.					
Time Since Open	The time that has elapsed since the connection was opened.					
Master Mode (To Note: Only displa	Slave) Modbus/TCP Connections ayed if active connections.					
Remote Connection	The Modbus/TCP master connection in IP Address:Port Number format (xxx.xxx.xxx.xxx:pppp).					
Tx Requests	Displays the number of Modbus requests that have been transmitted since the connection was opened.					
Rx Responses	Displays the number of Modbus responses that have been received since the connection was opened.					
Dedicated	Indicates if the connection is dedicated for a specified Modbus device ID.					
Device ID	If the connection is dedicated, the corresponding device ID.					
Time Since Open	The time that has elapsed since the connection was opened.					



8.7 Modbus Alias Device ID Statistics Page

Access the **Modbus Alias Device ID Statistics** page by clicking **Diagnostics I Modbus Diagnostics I Alias Diagnostics**.

	OL Ho	me Serial Moo	lbus Netwo	ork Data Maj	pping Diagnosti	s System			Logout
Communicati	on Modb	us Diagnostics	PROFINET IO	Diagnostics	Data Mapping Di	iagnostics	System Log		
Modbus Devi	ces Modb	ous/TCP Interface	Modbus/T	CP Connectio	ns Alias Diagnos	stics Share	ed Memory		
Modbus Ali Reset Statis	ias Device	e Id Statistics Modbus/TCP Master	Modbus Serial	Modbus over TCP	Modbus/TCP	Modbus Serial	Modbus over TCP		
10	105	Ves	master	Master	2261	Count	Count		
19	106	no	ves	ves	0	0	8633		
21	107	yes	yes	yes	2254	0	0		
								© Pennerl+Fuchs Co	mtrol Inc

Modbus Alias D	evice ID Statistics Page
Rx Device ID	Displays the device ID (also often called the unit ID) of the received message from a master.
Alias Device ID	The alias device ID to convert the received device ID to.
Modbus/TCP Master	If selected, this applies the alias device ID configuration to messages received from Modbus/TCP masters.
Modbus Serial Master	If selected, this applies the alias device ID configuration to messages received from serial Modbus masters.
Modbus over TCP Master	If selected, this applies the alias device ID configuration to messages received from Modbus RTU/ASCII over Ethernet TCP/IP masters.
Modbus/TCP Count	Number of Aliased Modbus messages received from Modbus/TCP masters.
Modbus Serial Count	Number of Aliased Modbus messages received from Modbus Serial masters.
Modbus over TCP Count	Number of Aliased Modbus messages received from Modbus over TCP masters.

8.8 Shared Memory Contents

This page displays the contents of a Shared Holding Register and Shared Coil blocks.

Access this page by clicking **Diagnostics I Modbus Diagnostics I Shared Memory** and select the **Holding Register Block** or **Shared Coil Block** that you want to display in the drop list.

8.8.1 Shared Holding Block Register Blocks

The following image illustrates Shared Holding Register Block 1. Use the drop list to view other register blocks.

Communicat	ion Mo	dbus Diad	inostics	PROFINE	T IO Dia	anostics	Data Ma	pping Dia	anostics	System Log
tedhue Deu	icon M	adhua/TCI	Intorf	Madh		Connection	Aline	Disenset	ice Char	red Memory
loabus Dev	ices M	oubus/ICF	' Inten	ace moub	us/TCP (Jonnection	IS Allas	Diagnost	ics sna	red Memory
harod Me	mory	Contonte	-							
	anory	contents	•							
hared Memo	ry Config			Reset Stat	istics		Refresh	1		Clear This Block Clear Entire Shared Memory
hared Holdin	a Registe	r Block 1	1	Write Me	ssanes:	40	Descri	ntion:		200 read write bolding registers
	y negiste	DIUCKIV	1	Read Mes	sanes.	1620049	Write	Enabled	Master(s): All (Except PROFINET IO)
isplay For	mat:	HEX	\sim	Blocked V	Vrites:	0	Accent	Broadca	ists.	No
ata lines p	er row:	10 ~		Divercu v		×	necep	Distuct		
Address	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
400001	5751	5752	0000	0000	0000	0000	0000	0000	0000	0000
400011	0000	5953	5954	5955	5956	5957	5958	5959	595A	595B
400021	595C	595D	595E	595F	5960	5961	5962	5963	5964	5965
400031	5966	5967	5968	5969	596A	596B	596C	596D	596E	596F
400041	5970	5971	5972	5973	5974	5975	5976	5977	5978	5979
400051	597A	597B	597C	597D	597E	597F	5980	5981	5982	5983
400061	5984	5985	5986	5987	5988	5989	598A	598B	598C	598D
400071	598E	598F	5990	5991	5992	5993	5994	5995	5996	5997
400081	5998	5999	599A	599B	599C	599D	599E	599F	59A0	59A1
400091	59A2	59A3	59A4	59A5	59A6	59A7	59A8	59A9	59AA	59AB
400101	59AC	59AD	59AE	59AF	59B0	59B1	59B2	59B3	59B4	5985
400111	59B6	59B7	59B8	0000	0000	0000	0000	0000	0000	0000
400121	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400131	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400141	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400151	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400161	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400171	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400181	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
400191	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000

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Shared Memory Content	Shared Memory Contents Page						
Shared Memory Config button	Click this button to jump to the Shared Memory Configuration page.						
Reset Statistics button	Click this button to reset the following: • Write messages • Read messages • Blocked writes						
Refresh button	Click this button to refresh this page.						
Clear This Block button	Click this button to clear the diagnostics and data contents of this Holding Register block.						
Clear Entire Shared Memory button	Click this button to clear the diagnostics and data contents of all Holding Register and Coil blocks.						
Shared Holding Register Block drop list	Use this drop list to select the Shared Holding Register Block or Shared Coil Block that you want to display.						
Rx Rsp	Displays the number of Modbus responses received from this device.						

Shared Memory Content	s Page (Continued)
Display Format	Selectable data format to display the contents of the Holding Register block data. • Hex - 16 bit word (default)
	 word-16 - unsigned 16 bit decimal
	• word-32 - unsigned 32 bit decimal
	string - ASCII character string
Data line per row	Selectable data entries per row to display the contents of the Holding Register block data.
	 10-per-row – ten entries display per row 20-per-row – twonty ontries displayed per row (default)
	 Zo-per-row – twenty entries displayed per row (default)
Write Messages	Displays the number of successful write messages to this Shared Memory block.
Read Messages	Displays the number of read messages addressed to this Shared Memory block.
Blocked Writes	Displays the number of write messages that were blocked, or prevented, from writing to this Shared Memory block. Note that blocked writes are treated as write violations and are added to the Write Violation Log.
Description	This is the description from the Shared Memory Configuration page.
Write Enabled Master(s)	Displays how this is configured in the Shared Memory Configuration page.
Accept Broadcasts	Displays if the Accept Broadcast Messages option is enabled in the Shared Memory Configuration page.



8.8.2 Shared Coil Blocks

This page displays the contents of the selected Shared Coil block.

Access this page from the **Shared Memory Configuration** page and click **Display** next to the Coil block that you want to display.

Communicat	tion Mo	dbus Di	agnostic	s PROF	INET IO	Diagnost	ics D	ata Ma	pping [Diagnos	stics 9	System	Log				
1odbus Dev	vices M	odbus/T	CP Inter	face M	odbus/T	CP Conne	ections	Alias	Diagno	stics	Shared	d Memo	ry				
hared Me	emory	Conter	ts														
hared Memo	ry Config		R	eset Statis	tics		Ref	resh			Clea	r This Bl	ock (lear Ent	ire Shar	ed Mem	ory
hared Coil Bl	ock 1		. w	rite Mes	sages: ()	Des	criptio	n:		320	read w	rite co	ils			
	UCK 1		Re	ad Mes	sages: 1	620049	Wri	te Fna	bled M	aster(5): All (I	Except	PROFIN	VET IO)			
			BI	ocked W	/rites: 0)	Acc	ept Bro	oadcas	ts:	No						
Address	+15	+14	+13	+12	+11	+10	+9	+8	+7	+6	+5	+4	+3	+2	+1	+0	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
241	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
273	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
289	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
305	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000

Shared Memory Contents Page - Shared Coil Blocks						
Shared Memory button	Selecting this button returns you to the Shared Memory Configuration page.					
Config button	Selecting this button returns you to the Shared Memory Configuration page.					
Reset Statistics button	Click this button to clear the diagnostics for this Holding Register block.					
Refresh button	Click this button to refresh the data on the page.					
Clear This Block button	This button clears the diagnostics and data contents of the Holding Register block in the drop list.					
Clear Entire Shared Memory button	Click this button to clear the diagnostics and data contents of all Holding Register and Coil blocks.					
Shared Coil Block Drop List	Use this drop list to display data for a specific Shared Holding Register Block or Shared Coil Block.					
Write Messages	Displays the number of successful write messages to this Shared Memory block.					
Read Messages	Displays the number of read messages addressed to this Shared Memory block.					
Blocked Writes	Displays the number of write messages that were blocked, or prevented, from writing to this Shared Memory block. Note that blocked writes are treated as write violations and are added to the Write Violation Log.					
Description	This is the description from the Shared Memory Configuration page.					



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Shared Memory Contents Page - Shared Coil Blocks (Continued)					
Write Enabled Master(s)	Displays how this is configured in the Shared Memory Configuration page.				
Accept Broadcasts	Displays if the Accept Broadcast Messages option is enabled in the Shared Memory Configuration page.				

8.9 **PROFINET IO Diagnostics**

The following table provides you information about the **Diagnostics | PROFINET IO Diagnostics** page.

COMTROL Home Serial Modbus	Network Data Mapping	Diagnostics	System		Logou		
Communication Modbus Diagnostics PRO	FINET IO Diagnostics Data	Mapping Diagn	ostics	System Log			
rstem Information							
PLC Interface							
Active Application Relationships:	1						
Application Relationship 1 Uptime:	20:12:46						
Application Relationship 2 Uptime:	N/A						
Total Application Relationships:	7						
Transmit Retries:	0						
Transmit Errors:	0						
System Errors:	4						
Record Read Errors:	0						
Ethernet Interface							
Ethernet Port 1 Link Status:	Link down						
Ethernet Port 2 Link Status:	100Mbps full duplex						
PROFINET IO Frames Transmitted:	1423362						
PROFINET IO Frames Received:	2406136						
Non PROFINET IO Frames Received:	3028195						
System Resource							
Heap Memory (total / free):	7120KB / 4506KB (63%)						
Idle Count (min / current / max):	891 / 2202 / 2393						
Idle Count History (1 / 5 / 15 mins):	2194 / 2191 / 2190						

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PROFINET IO Diagnostics	PROFINET IO Diagnostics Page						
PLC Interface							
Active Application Relationships	The number of active application relationships.						
Application Relationship 1 Uptime	The uptime of application relationship 1.						
Application Relationship 2 Uptime	The uptime of application relationship 2.						
Total Application Relationships	The total number of application relationships that have been established.						
Transmit Retries	The number of retries occurred when transmitting PROFIET IO frames.						
Transmit Errors	The number of errors occurred when transmitting PROFINET IO frames.						
System Errors	The number of system errors detected: Port MAC address information not available 						
	Errors occurred when accessing Ethernet interface						
	Invalid application relationship number						
	Invalid module, submodule, slot, or subslot number						
Record Read Errors	The number of errors occurred when reading record data.						

PROFINET IO Diagnostics Page (Continued)							
Ethernet Interface							
Ethernet Port Link 1 Status	The link status of Ethernet port 1.						
Ethernet Port Link 2 Status	The link status of Ethernet port 2. Only available on models with dual Ethernet ports.						
PROFINET IO Frames Transmitted	The number of PROFINET IO frames transmitted.						
PROFINET IO Frames Received	The number of PROFINET IO frames received.						
Non PROFINET IO Frames Received	The number of non PROFINET IO frames received.						
System Resource							
Heap memory (total / free)	Memory usage (total and free memory).						
Idle count (min / current / max)	The minimum, current, and maximum CPU idle count.						
Idle count history (1 / 5 / 15 mins)	The average CPU idle count in the last 1, 5, and 15 minutes.						

8.10 Modbus to Modbus Diagnostics Page

Access the **Modbus to Modbus Diagnostics** page by clicking **Diagnostics | Data Mapping Diagnostics | Modbus to Modbus**.

nmuni	ation Mo	dbus Diagnostics P	ROFINET IO D	Diagnostic	Data I			System Log								
dbus t	Modbus															
dhus	to Modb	us Diagnostics														
1003		us blagnostics														
Reset S	tatistics															
	acouco															
			Mo	dbus (Re	ad)	-			Modbus (Write)							
	Device	Function	Address (Base	Tx	Rx Msqs	No Path	Error Resps	Unexpected Resps	Device ID	Function Code	Address (Base	Tx Msgs	Rx Msgs	No Path	Error Resps	Unexpected Resps
Line	ID	Code	1)	msys												
Line 1	1D 87	Code 03: Holding Registers (40x)	1) 14	22506	22	0	22481	0	252	16: Multiple Registers (40x)	1	22	22	0	0	0
Line 1 2	1D 87 89	Code 03: Holding Registers (40x) 03: Holding Registers (40x)	1) 14 3	22506 22504	22 18	0	22481 22483	0	252 252	16: Multiple Registers (40x) 16: Multiple Registers (40x)	1 12	22 18	22 18	0	0	0

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Modbus to Mode	ous Diagnostics
Line	Displays the configuration line number.
Device ID (Read)	Displays the Modbus Device ID that is being read. This may be the device ID of either the Shared Memory or a Modbus slave device.
Function code	Displays the function being used to perform the read operation.
Address (base 1)	Displays the Modbus address in Base 1 format.
Tx Messages	Displays the number of read messages transmitted to the Shared Memory or Modbus device.
Error Responses	Displays the number of read response errors received from the Shared Memory or Modbus device.

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Modbus to Mode	ous Diagnostics
No Path	 Displays the number of no path conditions. No path conditions occur when any of the following occur: There is no valid destination to send the Modbus message.
	 There are no serial ports configured as slave ports.
	 There is no remote Modbus configuration for the device ID. If there is a remote Modbus configuration, the gateway is unable to connect to the Modbus/TCP IP address.
Unexpected Responses	Displays the number of unexpected read responses received from the Shared Memory or Modbus device. These occur when an incorrect function code is received in the response, or a response message is received when it is not expected.
Device ID (Write)	Displays the Modbus Device ID that is being written to. This may be the device ID of either the Shared Memory or a Modbus slave device.
Function code	Displays the function being used to perform the write operation.
Address (base 1)	Displays the Modbus address in Base 1 format.
Tx Messages	Displays the number of write messages transmitted to the Shared Memory or Modbus device.
Rx Messages	Displays the number of valid write responses received from the Shared Memory or Modbus device.
No Path	Displays the number of no path conditions. No path conditions occur when any of the following occur:
	There are no parial parts configured as alove parts
	There is no remote Modbus configuration for the device ID
	 If there is a remote Modbus configuration, the gateway is unable to connect to the Modbus/TCP IP address.
Error Responses	Displays the number of write response errors received from the Shared Memory or Modbus device.
Invalid Responses	Displays the number of invalid write responses received from the Shared Memory or Modbus device. These occur when an incorrect function code is received in the response, or a response message is received when it is not expected.
Reset Statistics	Resets the statistics to all zeros.

8.11 System Log

The **System Log** page provides system level information, which is updated every 10 seconds.

COMTROL Home Serial Modbus Network Data Mapping Diagnostics System ICDM-RX/PN1-4DB9/2R345-DIN	Logout
Communication Modbus Diagnostics PROFINET IO Diagnostics Data Mapping Diagnostics System Log	
System Log	
Refresh Clear Save	Logfile
<pre>1 01:47:54.586: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:47:55.676: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 60777 1 01:47:55.750: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:47:55.750: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:47:59.850: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:47:59.850: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:47:59.850: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:00.860: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:01.872: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:02.930: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:05.044: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:05.044: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:05.044: ERROR: Modbus RTU device timeout. port=2, unitId = 87, transId = 59659 1 01:48:05.044: ERROR: Modbus RTU device timeout. port=2, unitId = 81, transId = 59659 1 01:48:06.034: ERROR: Modbus RTU device timeout. port=2, unitId = 81, transId = 59659 1 01:48:07.086: ERROR: Modbus RTU device timeout. port=2, unitId = 81, transId = 7714 1 01:48:07.086: ERROR: Modbus RTU device timeout. port=2, unitId = 81, transId = 7714 1 01:48:07.086: ERROR: Modbus RTU device timeout. port=2, unitId = 81, transId = 7714 1 01:48:09.190: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:09.190: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:09.190: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:09.190: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:09.190: ERROR: Modbus RTU device timeout. port=2, unitId = 91, transId = 59659 1 01:48:09.190: ERROR: Modbus RTU device ti</pre>	~
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- Click the **Refresh** button to view the latest system log information.
- Click the Clear button to restart a new system log file.
- Click the **Save Logfile** button to save the system log file, if requested by Technical Support.

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9 System Menus

9.1 Update Firmware

The default System menu page is the Update Firmware page.





Use the following procedure to upload firmware.

- 1. Open your web browser and enter the IP address of the ICDM-RX/PN1.
- 2. Click the System menu, which opens the Update Firmware page.
- 3. Click the Browse button, navigate to the file, select it and click the Open button.
- 4. Click the **Update** button.

An Update In Progress pop up notifies you with the upload duration, not to reset or disconnect the device or to close the page.

Survey and a second sec	
Update In Progress	
Firmware update is in progress and may take 1-2 minutes.	
Do not reset or disconnect the device.	
Do not close this page or press the browser back/forward buttons.	

9.2 Configuration File

You can use the **Save Configuration** option to save an ICDM-RX/PN1 configuration file for recovery purposes or to quickly configure other ICDM-RX/PN1 units that require the same configuration using the **Load Configuration** option.

Note

Optionally, you can use PortVision DX to save and load configuration files.

- Click the Clear button to restart a new system log file.
- Click the Save Logfile button to save the system log file, if requested by Technical Support.

9.2.1 Saving a Configuration File



Use the following procedure to save a configuration file.

- 1. Open your web browser and enter the IP address of the ICDM-RX/PN1.
- 2. Click System | Configuration File.
- 3. Click the Save Configuration button.



4. Save the configuration file following your browser prompts.

9.2.2 Loading a Configuration File



You can use this procedure to load a previously saved ICDM-RX/PN1 configuration file.

- 1. Click System | Configuration File.
- Click the Browse button, highlight the configuration file you want to load, and click the Open button.

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3. Select Everything or the items you want to load.



4. Click the Load Configuration button.



9.3 System Snapshot Page

You can use the System Snapshot page to download a snapshot of the device status, log, and configuration. You may find the information can help you diagnose a problem with the ICDM-RX/PN1. In addition, this information may be requested by technical support if you have called for assistance.

- 1. Open your browser and enter the IP address of the ICDM-RX/PN1.
- 2. Click System | System Snapshot.
- 3. Click the Device Snapshot button.

	Home S	Gerial Mo	odbus	Network	Data Mapping) Diagnosti	cs System		Logout
Update Firmware	Configurat	tion File	System	n Snapsho	t Restore De	aults Rebo	ot		
System Snapsh	ot								
Download a snaps	hot of ICDM	I-RX syste	em stat	us, log, an	nd configuration	n to aid in tro	oubleshooting	3	
System Snapshot									
					Opening	dm_icdmrxpn1	-snapshot.txt	×	
					You have	chosen to ope	en:		
					dm	_icdmrxpn1-s	napshot.txt		
					fro	n: http://10.8.	tument 11.201		
					What sh	ould Firefox d	o with this file?		
					0 Qr	en with Not	epad (default)	~	
					• <u>S</u> a	ve File			
					Do	this <u>a</u> utomati	cally for files like	this from now on.	
								OK Cancel	
								© Pepperl+Fuchs Co	mtrol, Inc.

4. Save the file using the method appropriate for your browser.

9.4 Restore Defaults Page



You can easily some or all of your settings to factory defaults by using the procedure below.

- 1. Open your browser and enter the IP address of the ICDM-RX/PN1.
- 2. Click System | Restore Defaults.



3. Select Everything or the specific setting or settings that you want to restore.



- 4. Click the **Restore** button.
- 5. The ICDM-RX/PN1 reboots and re-opens the web interface.

9.5 Reboot Page

You can reboot the ICDM-RX/PN1 remotely using the Reboot web page.

- 1. Click System I Reboot.
- 2. Click the **Reboot Now** button or wait the 10 seconds for it automatically reboot.

	Home S	Serial	Modbus	Network	Data Mapping	Diagnostics	System	ICDM-RX/PN1-4DB9/2RJ45-DIN	Logout
Update Firmware	Configurati	on File	System	Snapshot	Restore Defau	ts Reboot	-		
Reboot Rebooting will dro ICDM-RX. Rebort Now	p all connecti	ions, apį	ply any p	pending set	tings, and restar	t the			
							_	@ Dapport - Fusha Car	



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10 Troubleshooting

This section contains troubleshooting information for your ICDM-RX/PN1. You should review the following subsections before calling Technical Support because they will request that you perform many of the procedures or verifications before they will be able to help you diagnose a problem.

10.1 Troubleshooting Checklist

The following checklist may help you diagnose your problem:

- Verify that you are using the correct types of cables on the correct connectors and that all cables are connected securely.
- Isolate the ICDM-RX/PN1 from the network by connecting the device directly to a NIC in a host system using a standard Ethernet cable.

Model	Connected To	Connector Name
ICDM-RX/PN1-DB9/RJ45-PM		10/100 Ethernet
ICDM-RX/PN1-ST/RJ45-DIN ICDM-RX/PN1-DB9/RJ45-DIN ICDM-RX/PN1-2DB9/RJ45-DIN ICDM-RX/PN1-2ST/RJ45-DIN	Ethernet hub or NIC	10/100
ICDM-RX/PN1-4DB9/2RJ45-DIN		10/100 E1 and E2

- Verify that the Ethernet hub and any other network devices between the system and the ICDM-RX/PN1 are powered up and operating.
- Reset the power on the ICDM-RX/PN1 and watch the Status light activity.

ICDM-RX/PN1 Status LED Activity	
5 sec. off, 3 flashes, 5 sec. off, 3 flashes	Redboot™ checksum failure.
5 sec. off, 4 flashes, 5 sec. off, 4 flashes	SREC load failure.
5 quick flashes	The PROFINET IO to Modbus application is starting up.
Blinks every 10 seconds	The PROFINET IO to Modbus application is running but there is no PLC connection.
On (solid)	One or more PLC connections have been established.
Elashing	LED flashing mode is enabled in PortVision DX
riashing	Error detection or diagnostics information available

- Verify that the network IP address, subnet mask, and gateway is correct and appropriate for the network. If IP addressing is being used, the system should be able to ping the ICDM-RX/PN1.
- Verify that the IP address programmed into the ICDM-RX/PN1 matches the unique reserved IP configured address assigned by the system administrator.
- If using DHCP, the host system needs to provide the subnet mask and gateway.
- Reboot the system and the ICDM-RX/PN1.
- If you have a spare ICDM-RX/PN1, try replacing the device.



10.2 General Troubleshooting

The following table provides some general troubleshooting tips.

General Condition	Explanation/Action
Status LED Flashing	Indicates that boot program has not downloaded to the unit. 1. Reboot the system.
	Make sure that you have downloaded the most current firmware for PROFINET IO to Modbus.
	<i>If the Status LED is still flashing, contact Technical Support.</i>
Status LED not lit	Indicates that power has not been applied or there is a hardware failure. Contact Technical Support.
Cannot ping the device through Ethernet hub	Isolate the ICDM-RX/PN1 from the network. Connect the device directly to the NIC in the host system.
Cannot ping or connect to the ICDM-RX/PN1	The default IP address is often not accessible due to the subnet masking from another network unless 192.168 is used in the network. In most cases, it will be necessary to program in an address that conforms to your network.
ICDM-RX/PN1 continuously reboots when connected to some Ethernet switches or routers	Invalid IP information may also cause the switch or router to check for a gateway address. Lack of a gateway address is a common cause.

10.3 Daisy-Chaining Models With Dual Ethernet Ports

ICDM-RX/PN1 models with two Ethernet ports follow the IEEE specifications for standard Ethernet topologies.

When using the E1/E2 ports, the ICDM-RX/PN1 is classified as a switch. When using the E1 or E2 port only, it is a simple end node device.

The maximum number of daisy-chained ICDM-RX/PN1 units, and the maximum distance between units is based on the Ethernet standards and will be determined by your own environment and the conformity of your network to these standards.

Pepperl+Fuchs has tested with seven ICDM-RX/PN1 units daisy-chained together using 10 foot CAT5 cables, but this is not the theoretical limit. You may experience a performance hit on the devices at the end of the chain, so it is recommended that you overload and test for performance in your environment. The OS and the application may also limit the total number of ports that may be installed.

Following are some quick guidelines and URLs of additional information. Please note that standards and URLs do change.



Note

Category 3 or 5 twisted pair cables look the same as telephone cables but they are not the same. The network will not work if telephone cables are used to connect the equipment.

- Ethernet 10BASE-T Rules
 - The maximum number of repeater hops is four.
 - You can use Category 3 or 5 twisted-pair 10BASE-T cables.
 - The maximum length of each cable is 100m (328ft).
- Fast Ethernet 100BASE-TX rules
 - The maximum number of repeater hops is two (for a Class II hub). A Class II hub can be connected directly to one other Class II Fast Ethernet hub. A Class I hub cannot be connected directly to another Fast Ethernet hub.

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- You must use Category 5 twisted-pair 100BASE-TX cables.
- The maximum length of each twisted-pair cable is 100m (328ft).
- The total length of twisted-pair cabling (across directly connected hubs) must not exceed 205m (672ft).
- IEEE 802.3 specification: A network using repeaters between communicating stations (PCs) is subject to the "5-4-3" rule of repeater placement on the network:
 - Five segments connected on the network.
 - Four repeaters.
 - Three segments of the 5 segments can have stations connected. The other two segments must be Internet repeater link segments with no stations connected.

Additional information may be found by searching the web.

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