



Allen-Bradley

DeviceNet PCI Communication Interface Card

1784-PCIDS, -CPCIDS

DeviceNet[®]

User Manual

**Rockwell
Automation**

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION



Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss

Attention statements help you to:

- identify a hazard
- avoid a hazard
- recognize the consequences

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

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If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet the Council Directive 89/336/EC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part, documented in a technical construction file:

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This product is intended for use in an industrial environment.

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This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 - Equipment Requirements and Tests. For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the Allen-Bradley publication Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1.

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

About This User Manual

Introduction

This manual applies to both the 1784-PCIDS and 1784-CPCIDS communication interface cards. These cards provide DeviceNet configuration and I/O scan capabilities and are functionally equivalent. In the screen shots and examples in this manual, we reference the 1784-PCIDS scanner, but understand that the 1784-CPCIDS scanner can be used in the same way.

This manual provides an example network that demonstrates how to configure a DeviceNet network using the 1784-PCIDS card and RSNetWorx for DeviceNet[™] software.

This manual describes how:

- to install and configure your 1784-PCIDS card
- to configure the DeviceNet network and map I/O data using RSNetWorx for DeviceNet software
- to test and verify your DeviceNet network

This manual is designed to provide you enough information to get the example network up and running. Use this manual if you are knowledgeable about DeviceNet networks, but may not have experience interfacing them to PCI- or CPCI-bus computers. The information provided is a base; modify or expand the examples to suit your particular needs.

Audience

This manual is intended for control engineers and technicians who are installing, programming, and maintaining a control system that includes communicating with a DeviceNet network using a PCI-bus computer through a 1784-PCIDS card or using a compact PCI-bus computer through a 1784-CPCIDS card.

We assume that you:

- are developing a DeviceNet network using a personal computer in conjunction with a 1784-PCIDS, -CPCIDS card
- know each of your device's I/O parameters and requirements
- are experienced with the Microsoft[®] Windows[™] environment
- are familiar with RSNetWorx for DeviceNet software

The Example Network

This manual describes how to set up an example network. The manual provides examples of each step of the setup, with references to other manuals for more details.

System Components

We used the following devices and software for the example network in this manual. For your own application, substitute your own devices to fit your needs. The recommended configurations in this user manual will help you set up the test system and get it working. Your eventual configuration will depend on your application.

Note: If you use different software versions of these products some of your screens may appear different from those shown in the examples.

	Product Name	Catalog Number	Version
Qty	Hardware		
1	DeviceNet PCI communication interface card	1784-PCIDS	2.002
1	RediSTATION Operator Interface	2705-T3DN1A42A	-
1	Series 9000 Photoeye	42GNP-9000 or equivalent	-
1	24V Power Supply	any regulated 24VDC, 8A	-
1	PC	IBM-compatible PCI-bus architecture Windows NT 4.0, Service Pack 5 or later	-
	DeviceNet dropline or trunkline cables and connectors, as needed	1787-PCABL, -TCABL, -MCABL	-
	Software		
	RSNetWorx for DeviceNet	9357-DNETL3,	2.22
	RSLink/RSLink Gateway	9355-WAB	2.20
	IOLink	(supplied with 1784-PCIDS card)	1.14

Common Techniques Used in This Manual

The following conventions are used throughout this manual:

- Bulleted lists provide information, not procedural steps.
- Numbered lists provide sequential steps.
- Information in **bold** contained within text identifies menu windows, or screen options, screen names and areas of the screen, such as dialog boxes, status bars, radio buttons and parameters.

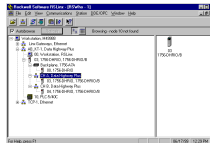
TIP

This symbol identifies helpful tips.



This is a definition box. When a word is bold within the text of a paragraph, a definition box will appear in the left margin to further define the text.

A **definition box** defines terms that may be unfamiliar to you.



Screen captures are pictures of the software's actual screens. The names of screen buttons and fields are often in bold in the text of a procedure. Pictures of keys represent the actual keys you press.

Where to Find More Information

Refer to the following publications as needed for additional help when setting up and using your DeviceNet network:

For information about	See this publication or product	Publication Number
the 1784-PCIDS DeviceNet Scanner Card	DeviceNet PCI Communication Interface Card Installation Instructions	1784-5.31
DeviceNet	DeviceNet System Overview	DN-2.5
	DeviceNet Cable Planning and Installation Manual	DN-6.7.2
	DeviceNet Cable Planning and Installation Release Note 1	DN-6.7.2-RN1
the RediSTATION	RediSTATION Operator Interface User Manual	2705-804
the 9000 Series Photoeye	{refer to the information that came with your photoeye}	n/a
IOLinX software	DeviceNet PCI Communication Interface Card Installation Instructions	1784-5.31
RSLinX software	RSLinX Lite User's Guide	9399-WAB32LUG
RSNetWorx for DeviceNet software	Getting Results with RSNetWorx for DeviceNet	9399-DNETGR
Developing your own Visual Basic or C++ application	IOLinX Software Development Kit	9230-IOLINXSDK
	IOLinX SDK Data Sheet	NETS-SP-010C-US-E
terms and definitions	Allen-Bradley Industrial Automation Glossary	AG-7.1

TIP



Many of these manuals are available online from the Automation Bookstore:
<http://www.theautomationbookstore.com>.

TIP



For more information on Rockwell Software products, visit the Rockwell Software internet site:
<http://www.software.rockwell.com>.

Terminology

This term	Means
Change of State	A type of I/O data communication. The scanner module can send and receive data with slave devices that have the change of state feature. Data is sent either whenever a data change occurs, or at the rate of the heartbeat if no data has changed.
Cyclic	A type of I/O data communication. The scanner can send and receive data with slave devices that have the cyclic feature. Data is only sent at a user-configurable rate.
Dual Mode	The scanner is in dual mode when it serves as a master to one or more slaves and as a slave to another master simultaneously.
EDS	Electronic Data Sheet. A vendor-supplied template that specifies how information is displayed as well as what is an appropriate entry (value).
EPR	Expected Packet Rate. One quarter of the time in milliseconds that the scanner must wait to hear from a device before deciding the connection has failed.
Explicit Messaging	Messaging protocol that states the meaning of the message. This protocol commands the performance of a particular task and returns the results of the task performance to the requestor. Used for lower priority tasks, such as configuration and data monitoring.
Heartbeat Rate	This only applies to change of state messaging. Devices that are configured for change of state data also send a "heartbeat" signal to indicate the device is still operating on the network even if no data has changed.
Host Platform	The computer in which the 1784-family scanner is installed.
I/O	An abbreviation for "input and output."
Implicit Messaging	The type of messaging used for high priority I/O control data; e.g., change of state, cyclic, polled, or strobed.
Input Data	Data produced by a DeviceNet device and collected by the scanner for a host platform to read.
MAC ID	The network address of a DeviceNet node.
Network	The DeviceNet network or the RSNetWorx for DeviceNet software representation of the network.
Node	Hardware that is assigned a single address on the network (also referred to as device).
Offline	When the RSNetWorx is not communicating on the network.
Online	When RSNetWorx is configured and enabled to communicate on the network.
Output Data	Data that is produced by a host application and written to the scanner's memory. This data is sent by the scanner to DeviceNet devices.
PC	Abbreviation for an IBM® compatible personal-computer.
Polled	A type of input/output-data communication. A polled message solicits a response from a single, specified device on the network (a point-to-point transfer of data).
Record	The node address and channel-specific memory assigned in the scanner's non-volatile storage for a node in the scanlist.
Rx	An abbreviation for "receive".
Scanlist	The list of devices (nodes) with which the scanner is configured to exchange I/O data.
Scanner	The function of the 1784-family scanner to support the exchange of I/O with slave modules.

Slave Mode	The scanner is in slave mode when it is placed in another module's scanlist as a slave device. This is used to share data between scanners.
Strobed	A type of I/O data communication. A strobed message solicits a response from each strobed device (a multicast transfer). It is a 64-bit message that contains one bit for each device on the network.
Tx	An abbreviation for "transmit".

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Contact your local Rockwell Automation representative for:

- sales and order support
- product technical training
- warranty support
- support service agreements

Technical Product Assistance

If you need to contact Rockwell Automation for technical assistance, call your local Rockwell Automation representative, or call Rockwell directly at: 1 440 646-5800.

For presales support, call 1 440 646-3NET.

You can obtain technical assistance online from the following Rockwell Automation WEB sites:

- www.ab.com/mem/technotes/kbhome.html (knowledge base)
- www.ab.com/networks/eds (electronic data sheets)

Your Questions or Comments about This Manual

If you find a problem with this manual, please notify us of it on the enclosed Publication Problem Report (at the back of this manual).

If you have any suggestions about how we can make this manual more useful to you, please contact us at the following address:

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Before You Begin

What This Chapter Contains

This chapter provides an overview of communication between a personal computer running the host application and DeviceNet devices via a 1784-PCIDS card. The following table identifies where to find specific information.

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What You Need to Know

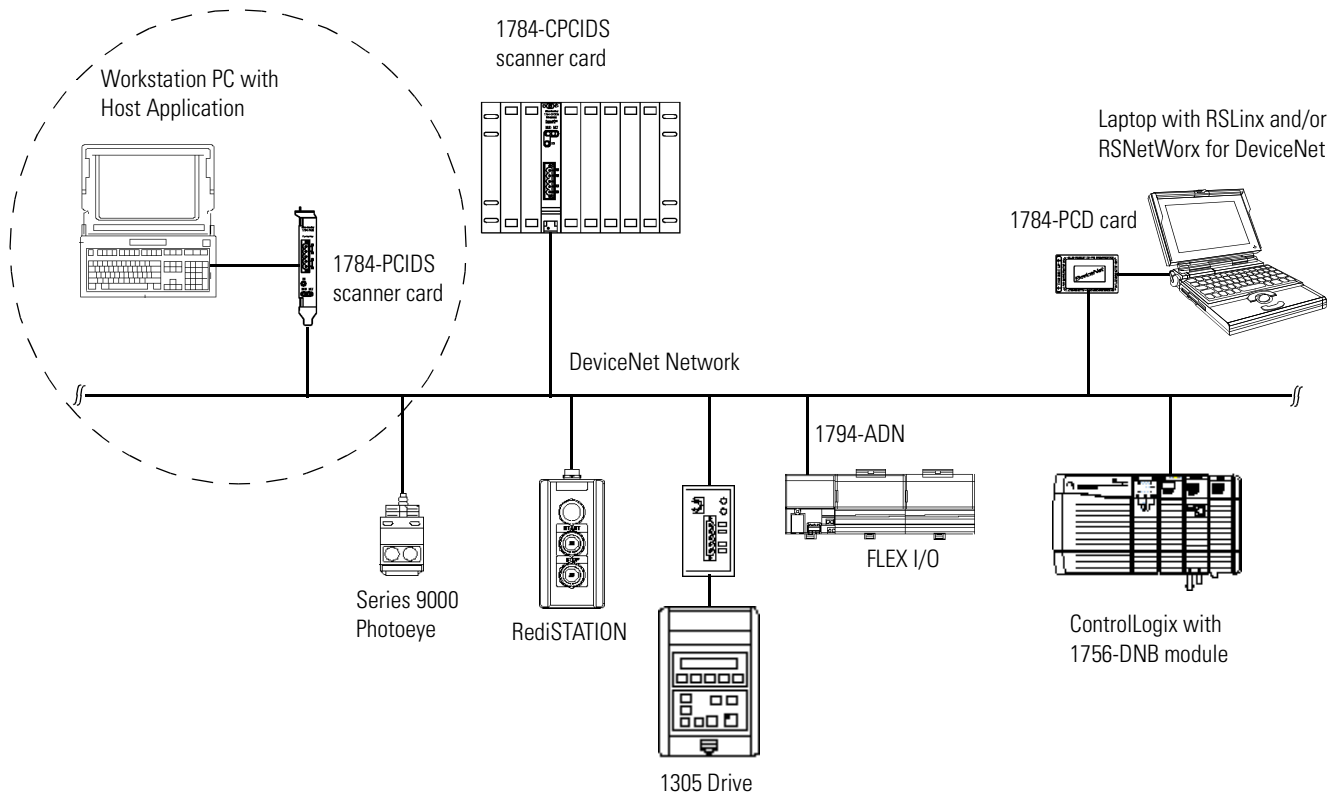
Before configuring your 1784-PCIDS card, you must understand:

- the data exchange between a host application and DeviceNet devices through the 1784-PCIDS card
- user-configurable scanner module data tables
- the role of RSNetWorx for DeviceNet software
- the role of IOLinx software

What Your 1784-PCIDS Card Does

In a typical configuration, the 1784-PCIDS card acts as an interface between a host application and the DeviceNet network.

DeviceNet Network



The interface card communicates with DeviceNet devices over the network to:

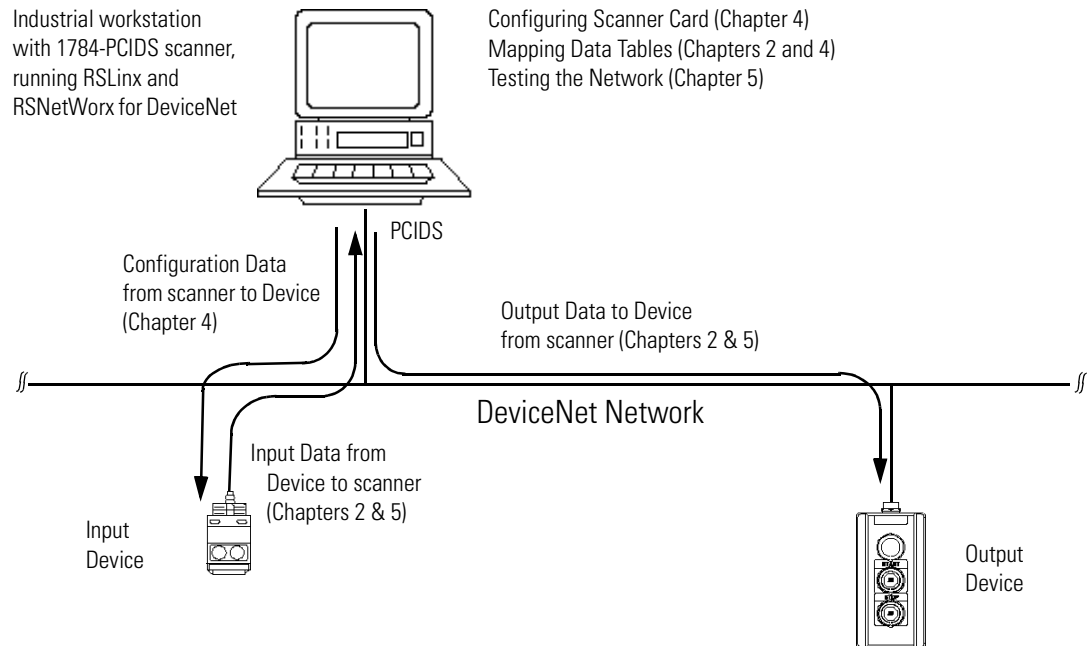
- read inputs from a device
- write outputs to a device
- download configuration data
- monitor a device's operational status

The scanner engine in the PCIDS communicates with the host application in the form of Input, Output, and Diagnostic Tables. Information exchanged includes:

- device I/O data
- status information
- configuration data

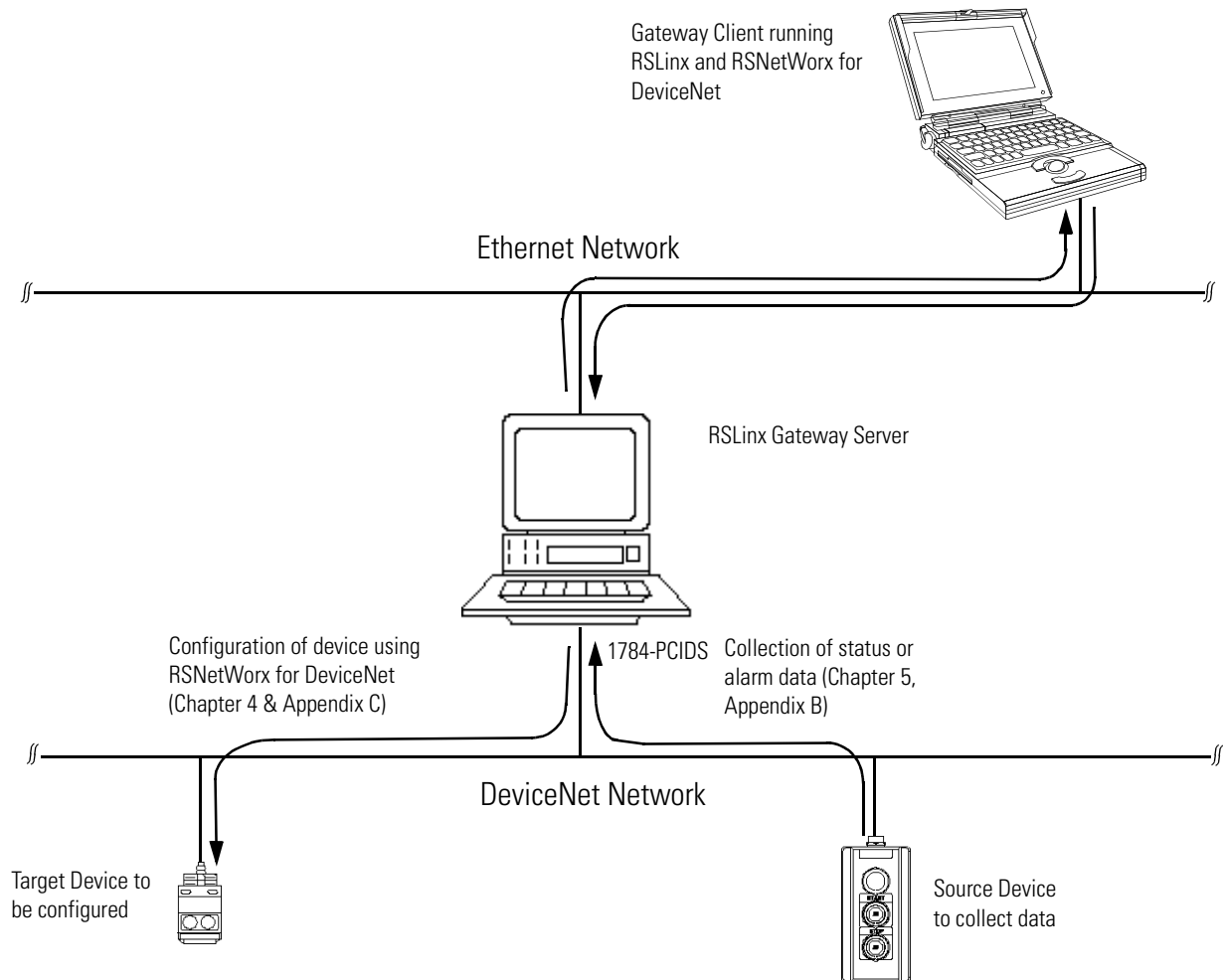
An I/O DeviceNet configuration is shown in the following figure. See the referenced chapters for more information.

I/O DeviceNet Configuration



The 1784-PCIDS card can be used within the RSLinx Gateway architecture to bridge a DeviceNet network to another network, such as Ethernet (shown below) or Data Highway Plus.

Configuring Devices and Data Collection on Higher Level Networks Using RSLinx Gateway Architecture



Communicating with Your Devices

A strobe message is a multicast transfer of data (which is 64 bits in length) sent by the scanner that solicits a response from each strobed slave device. There is one bit for each of the possible 64 node addresses. The devices respond with their data, which can be as much as 8 bytes.

A poll message is a point-to-point transfer of data (0-255 bytes) sent by the scanner that solicits a response from a single device. The device responds with its input data (0-255 bytes).

A change of state message is a transfer of data sent whenever a data change occurs. A user-configurable heartbeat rate can also be set to allow devices to indicate proper operation during intervals between data changes. This does not solicit response data, but may receive an acknowledge message.

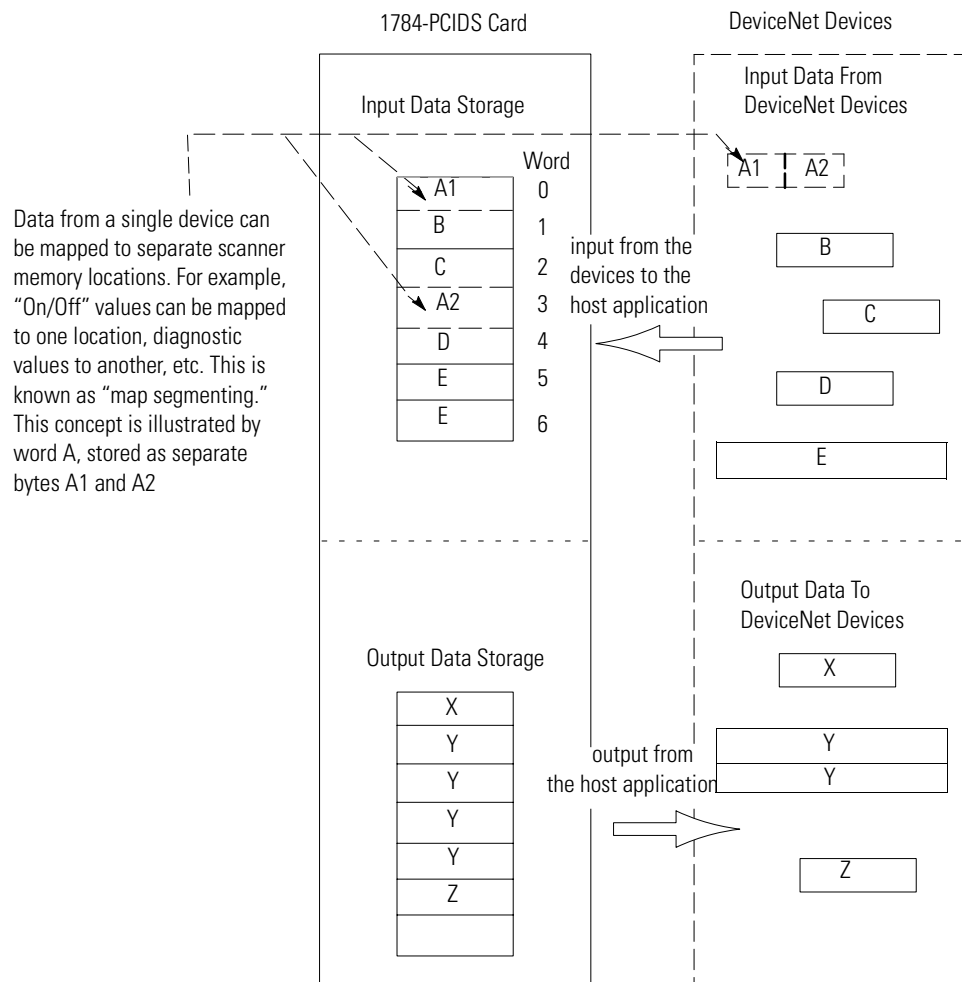
A cyclic message is sent only at a user-configurable rate, such as every 10 ms.

Your scanner communicates with a device via **strobe**, **poll**, **change of state**, and/or **cyclic** messages. It uses these messages to solicit data from or deliver data to each device. Data received from the devices, or input data, is organized by the scanner and made available to your host application. Data received from your host application, or output data, is organized in the scanner and sent on to your devices.

IMPORTANT

Throughout this document, *input* and *output* are defined from the host application's point of view. Output is data sent from the host application *to* a device. Input is data collected by the host application *from* a device.

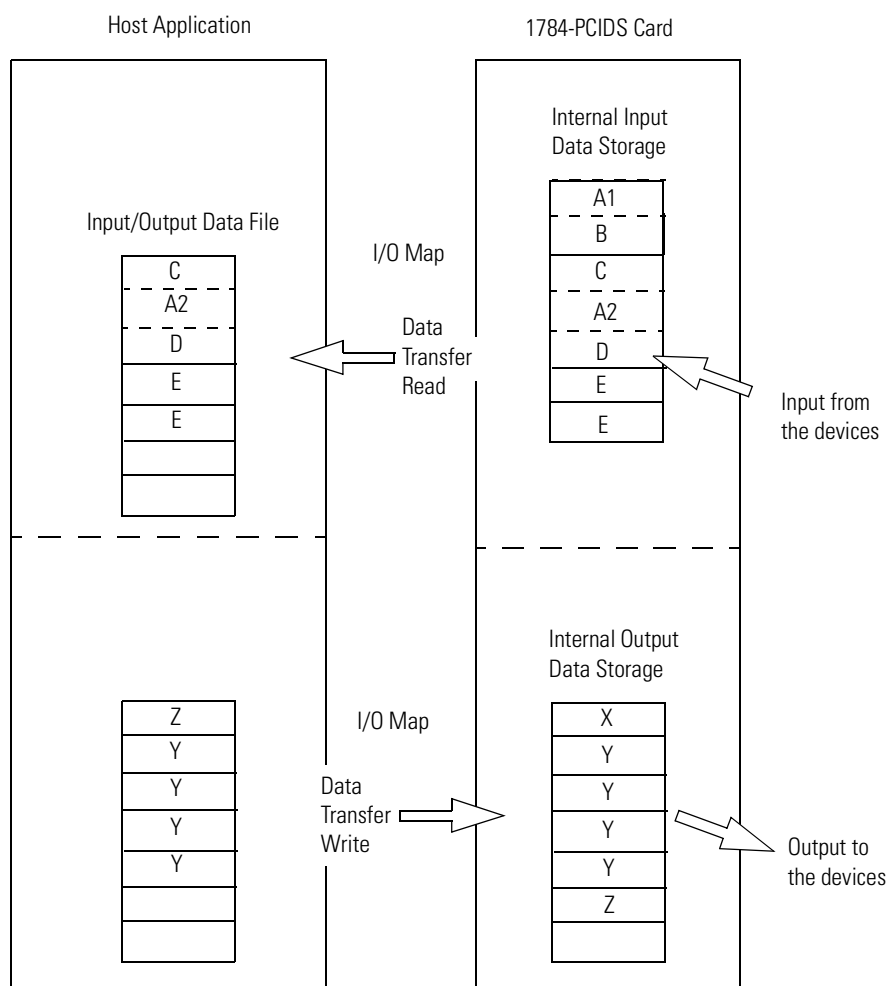
All data is sent and received on a DeviceNet network in byte lengths. A device may, for example, produce only two bits of input information. But since the minimum data size is one byte, the two bits of information are embedded in a full byte of data sent by the device. In this case, the other six bits are insignificant.



Communicating with Your Host Application

Your host application communicates with the scanner via **input and output image tables**. Input data, gathered from the network's devices, is organized within the scanner and made available for the host application to "read" from the input image table.

The scanner does not send data to your host application. Data transferred between the scanner and the host application must be initiated by the host application. Output data is sent, or "written," to the scanner by your host application by placing the data in the output image table. This data is organized in the scanner, which in turn passes the data on to your scanned devices via strobe, poll, change of state, or cyclic messages.



What Scanner Data Tables Are and What They Do

To manage the flow of I/O data between your host application and the network devices, the scan engine inside the 1784-PCIDS card uses the following data tables:

- Scanner Configuration Table
- Scan List Table
- Device Input Data Table
- Device Output Data Table
- Device Idle Table
- Device Failure Table

You can configure these data tables through RSNetWorx software.

RSNetWorx Software as a Configuration Tool

RSNetWorx for DeviceNet software is used to configure the scanner's data tables in our example. This software tool connects to the scanner locally (or remotely if you wish) over the DeviceNet network via the 1784-PCIDS card.

TIP

RSNetWorx for DeviceNet software can also configure the scanner from a remote location via a gateway. See Appendix C.

RSNetWorx for DeviceNet Tutorial

RSNetWorx for DeviceNet software comes with a tutorial which will guide you through the configuration process. Please refer to the tutorial if you have any questions about the configuration process described in this manual.

What's Next?

The remaining sections of this manual provide the following information:

- Chapter 2 covers the configuration process planning stage through a data mapping example.
- Chapter 3 describes the hardware setup for the example network.
- Chapter 4 covers configuration of the DeviceNet network using RSNetWorx for DeviceNet software.
- Chapter 5 describes how to test the network.

Planning Your Configuration and Data Mapping Your Devices

What This Chapter Contains

This chapter introduces questions you should ask before configuring your 1784-PCIDS card. In addition, it presents an example DeviceNet network and I/O data mapping scheme for a photoeye and a RediSTATION operator interface module. The following table identifies what this chapter covers and where to find specific information.

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Mapping RediSTATION Output Data	2-6

What You Need to Know

To map data via your 1784-PCIDS communication interface card, you must understand:

- your network requirements
- how input data is mapped
- how output data is mapped

Beginning the Process

Planning before configuring your 1784-PCIDS communication interface card helps make sure that you can:

- use your memory and bandwidth efficiently
- cater to device-specific needs and requirements
- give priority to critical I/O transfers
- leave room for expansion

A very important question to answer is “what is on your network?” You should be familiar with each device’s:

- communication requirements
- I/O importance and size
- frequency of message delivery

You should also ask “how might this network appear in the future?” At this point in your planning, it is advantageous for you to have some idea of how the network could be expanded. I/O data mapping can be performed automatically by the RSNetWorx software. But when mapping your I/O, you also have the opportunity to allot room for future I/O. This can save time and effort in the future.

For example, RSNetWorx will automatically map the devices as efficiently as possible, but the result is that multiple devices may share parts of the same word in memory (e.g., Device “A” may be mapped to the upper 8 bits and Device “B” to the lower 8 bits). However, you can also have the system map the devices such that no two devices share the same word by selecting the “word align” option when performing automapping. You can manually map the devices if you need to assign them to specific memory locations.

For details refer to the Help screens provided by the RSNetWorx for DeviceNet software. Additional support can be found at the Rockwell Software website: <http://www.software.rockwell.com>.

The Example Network

The following example illustrates a data mapping plan for a DeviceNet network. Note that even if the mapping is performed automatically by the RSNetWorx software, you must know where the devices are mapped in order to use them in your application.

Example Network Devices

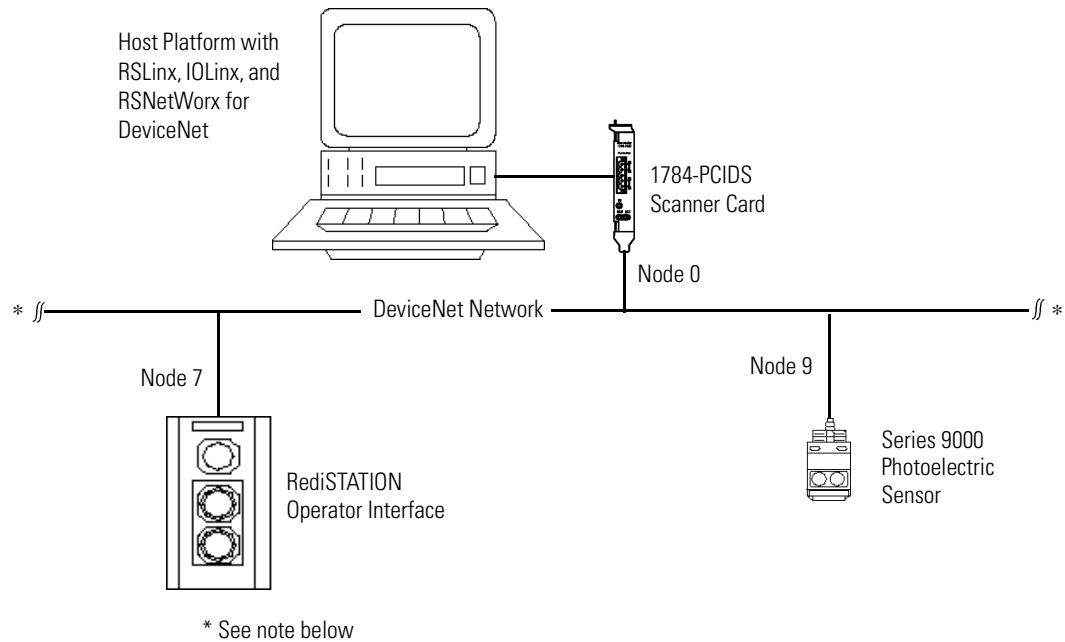
This example network has the following devices:

- a PC host platform running RSNetWorx for DeviceNet software
- a 1784-PCIDS scanner card interfacing the host application with a DeviceNet network
- a Series 9000 photoelectric sensor (strobed)
- a RediSTATION operator interface (polled)
- a 24 volt DC power supply

IMPORTANT

In the following example, output is data sent *to* a device from the host application. Input is data collected *from* a device by the host application.

The example DeviceNet system we will set up is shown below:

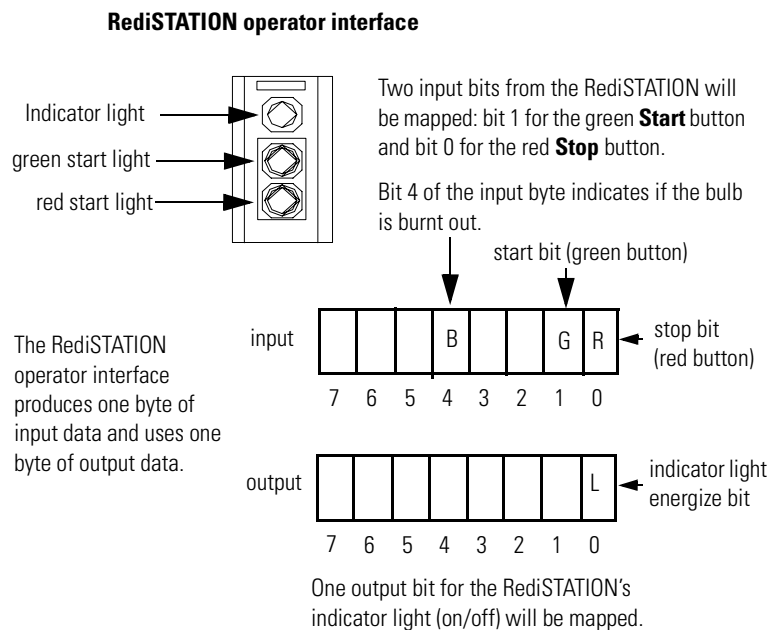
**IMPORTANT**

Each end of the DeviceNet trunk cable must be properly terminated with a resistor. Refer to the DeviceNet Cable Planning and Installation Manual, publication DN-6.7.2 for detailed information.

RediSTATION Operator Interface Data Mapping

The RediSTATION has both inputs and outputs that must be mapped. The input byte is mapped to the 1784-PCIDS scanner's input data table. The output byte is mapped to the 1784-PCIDS scanner's output data table.

The mapping procedure, using RSNetWorx for DeviceNet software, is described on pages 4-16 to 4-18.



In the RediSTATION's bits for the red and green buttons and the indicator light energize bit:

- 1 = ON
- 0 = OFF

Mapping RediSTATION Input Data

The RediSTATION operator interface's input byte is mapped to the scanner's input data table.

What's Happening?

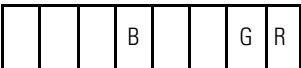
The operator presses the green start or red stop button.

- 1 The bits for the RediSTATION operator interfaces's red and green buttons are mapped into the scanner's data table. The "R" or "G" bit turns on.
- 2 The host application reads word zero into its input data file and reacts accordingly.

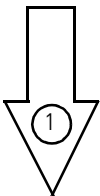
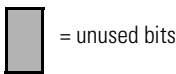
Important: The scanner only makes the data file available for the host application to read. The scanner does not move the data file to the host application.

RediSTATION Input Byte

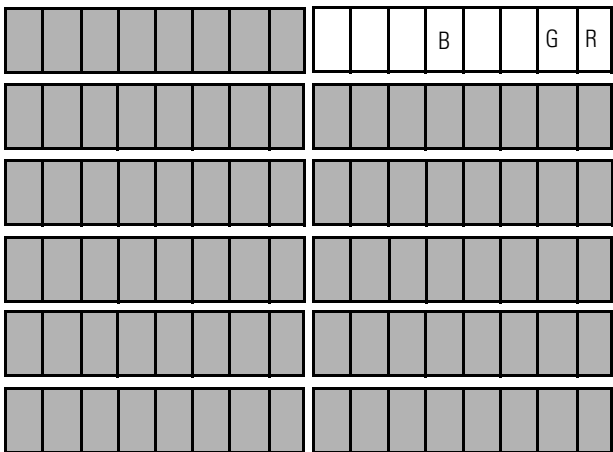
start/stop station node address 7



R = bit for red button (STOP)
G = bit for green button (START)



1784-PCIDS Scanner Input Image Table¹



Word 0

Word 1

Word 2

Word 3

Word 4

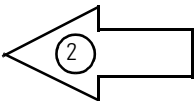
Word 5

up¹ to

Word 1023

**Host Application
Input Data File**

Word 0	0000 0000 000B 00GR
Word 1	0000 0000 0000 0000
Word 2	0000 0000 0000 0000
Word 3	0000 0000 0000 0000
Word 4	0000 0000 0000 0000
Word 5	0000 0000 0000 0000



Example: The green START button from the RediSTATION appears in word 0, bit 1 in the host application's input data file.
The red STOP button appears in word 0, bit 0 in the host application's input data file.



¹This mapping is based upon the example in chapter 5.
The mapping for your system may be different.

Mapping RediSTATION Output Data

The RediSTATION operator interface's output byte is mapped to the scanner's output data table. Within the output byte is bit 0 for the indicator light. The output data file is then transferred from the host application to turn the light on or off.

What's Happening?

The host application writes to bit 0 ("L") of word 0 in its Output Data File.

- ① The indicator light bit for the RediSTATION is mapped to the scanner's output data table.
- ② The output image table is then sent to the RediSTATION via a poll message from which the RediSTATION receives its indicator light bit.

The RediSTATION indicator light then turns on or off.

RediSTATION Output Byte

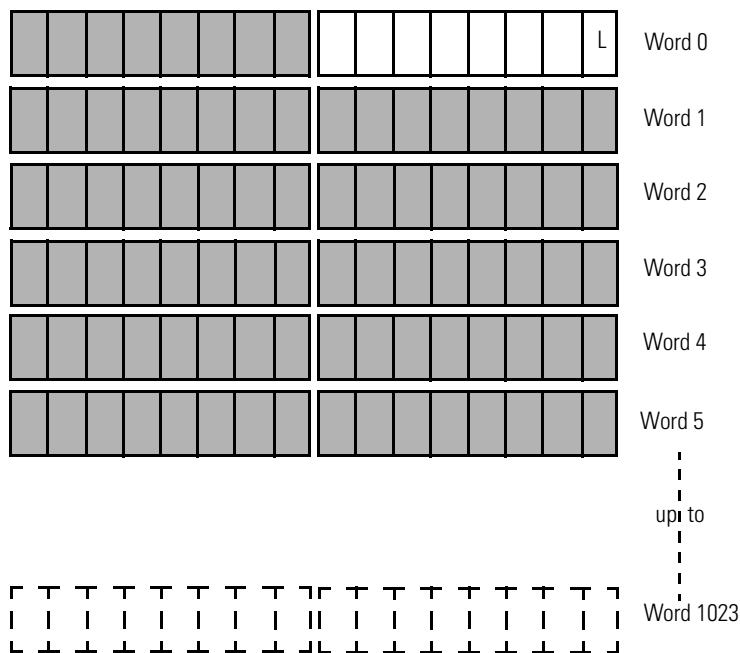
start/stop station node address 7



L = bit for the station indicator light

 = unused bits

1784-PCIDS Scanner Output Image Table¹



Host Application Output Data File

Word 0	0000 0000 0000 000L
Word 1	0000 0000 0000 0000
Word 2	0000 0000 0000 0000
Word 3	0000 0000 0000 0000
Word 4	0000 0000 0000 0000
Word 5	0000 0000 0000 0000

Example: The RediSTATION's indicator light (L) is taken from word 0, bit 0 in the host application's output image table.

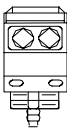
¹This mapping is based upon the example in chapter 5. The mapping for your system may be different.

Photoeye Input Data Mapping

The photoelectric sensor (photoeye) inputs are mapped to the 1784-PCIDS scanner's input data table. The mapping procedure using RSNetWorx for DeviceNet software is described on pages 4-16 to 4-17.

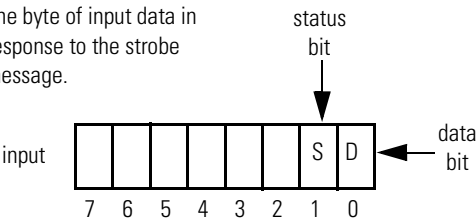
The photoeye has no outputs to map.

Series 9000 Photoeye



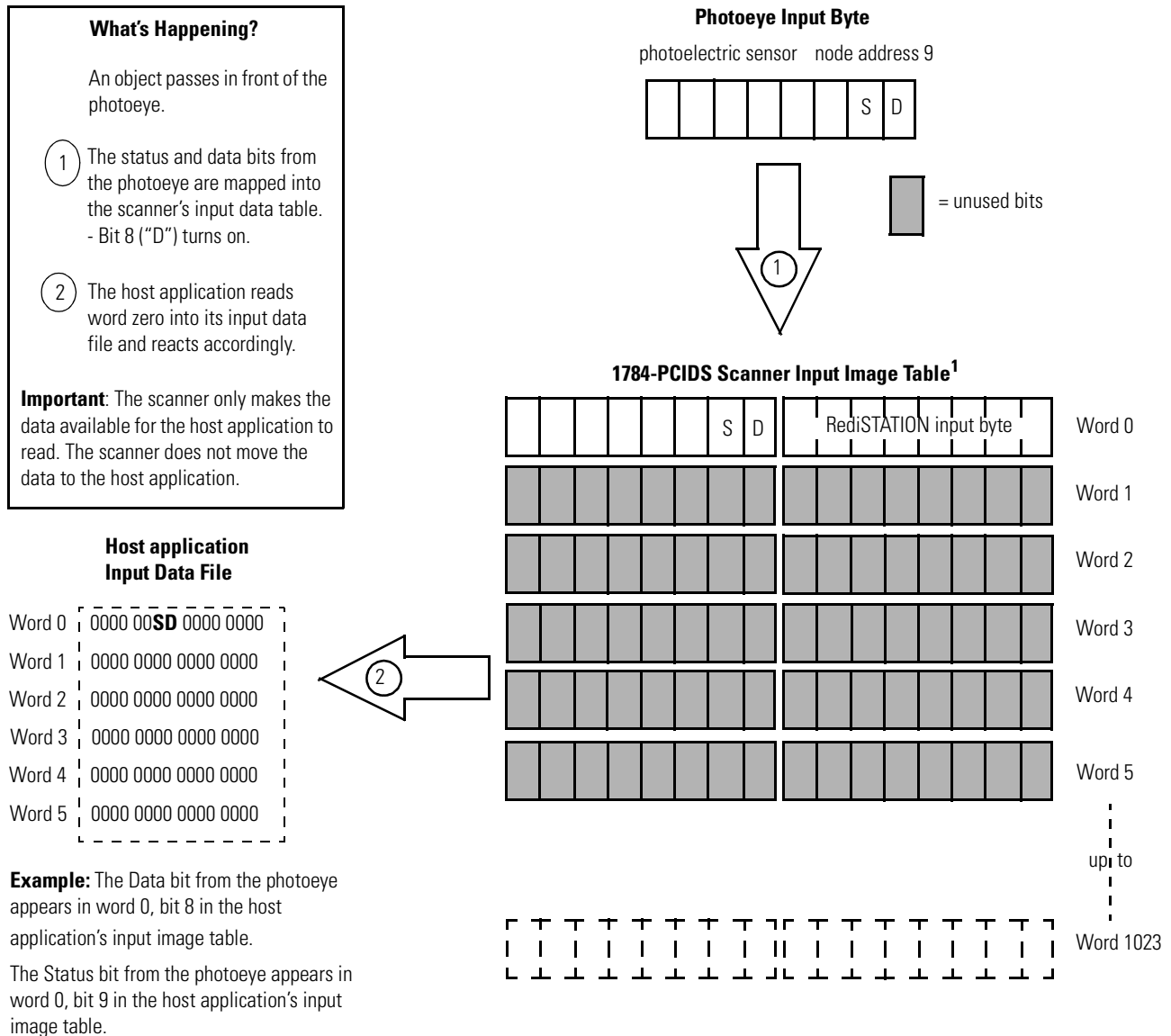
Two input bits from the photoeye will be mapped: the status bit and the data bit.

The photoeye produces one byte of input data in response to the strobe message.



Mapping Photoeye Input Data

The photoeye's input byte is mapped to the scanner's input data table.



¹This mapping is based upon the example in chapter 5. The mapping for your system may be different.

What's Next?

Chapter 3 describes how to set up the system hardware for the example network.

Setting Up the Hardware for the Example Network

What This Chapter Contains

This chapter describes how to set up the DeviceNet hardware for the example network. The following table describes what this chapter contains and where to find specific information.

Note that the example network uses a 1784-PCIDS card. The steps for setting up a network using a 1784-CPCIDS card will differ slightly.

For information about	See page
Installing the 1784-PCIDS Card	3-1
Accessing the Computer's Expansion Slots	3-2
Inserting the Card	3-3
Connecting the Card to the DeviceNet Network	3-3
Installing the RediSTATION Operator Interface	3-5
Installing the Series 9000 Photoeye	3-6
How the Example System Should Look	3-7

IMPORTANT

Rockwell recommends that you install all PCI cards first, before you install any ISA cards in your computer.

Installing the 1784-PCIDS Card

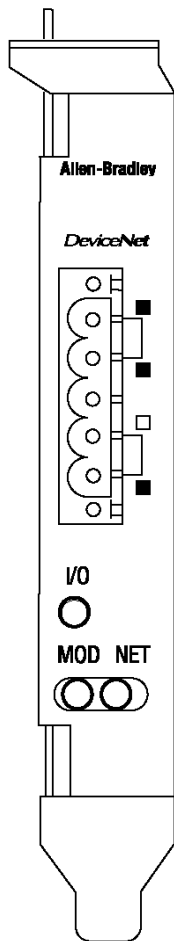
This section provides basic information on installing the 1784-PCIDS card.

You need a PCI-bus based personal computer with:

- Windows NT 4.0 with Service Pack 5⁽¹⁾ or later
- one open PCI slot
- approximately 2 MB available disk space

For detailed information refer to the DeviceNet PCI Communication Interface Card Installation Instructions, publication 1784-5.31.

⁽¹⁾ Required by SoftLogix 5.

**ATTENTION**

The PCIDS card uses CMOS technology, which is highly sensitive to electrostatic discharge (ESD). ESD may be present whenever you are handling the card. Handling a card without any EDS protection can cause internal circuit damage that may not be apparent during installation or initial use.

Take these precautions to guard against electrostatic damage:

- Before handling the card, be sure to touch a grounded object such as a PC's metal chassis to discharge any built-up static charge.
- Avoid touching the backplane connector or interface connector pins.
- When the card is not in use, store it in the anti-static bag in which it was shipped.

IMPORTANT

Remember, a computer with AC power disconnected is *not* a grounded object.

Make sure you know how to:

- install hardware in your computer
- configure the computer's options before you install the PCID(S)

Consult your computer's documentation for specific information.

To install the card:

1. Gain access to the computer's expansion slots.
2. Insert the card into an open PCI slot in the computer.

Accessing the Computer's Expansion Slots

To install the PCIDS card, you must access the computer's expansion slots. Refer to your computer's user guide for instructions on how to:

- Power down the host computer by turning off the power switch
- Remove the computer's cover
- Locate a vacant PCI expansion slot
- Remove the slot's expansion cover

Inserting the Card

To insert the card inside the computer:

1. Follow the card handling instructions on page 3-2.
2. Insert the PCIDS card into the edge connector and tighten the expansion slot screw.
3. Connect the card to the DeviceNet Network as described in the following section.

Connecting the Card to the DeviceNet Network

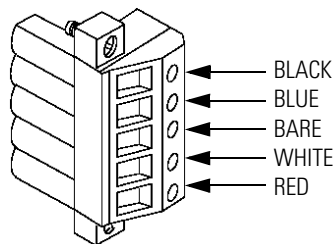
ATTENTION



Do not wire your 1784-PCIDS card with power applied to your network. You may short circuit your network or disrupt communication.

Perform the following steps to connect your 1784-PCIDS card to the DeviceNet network:

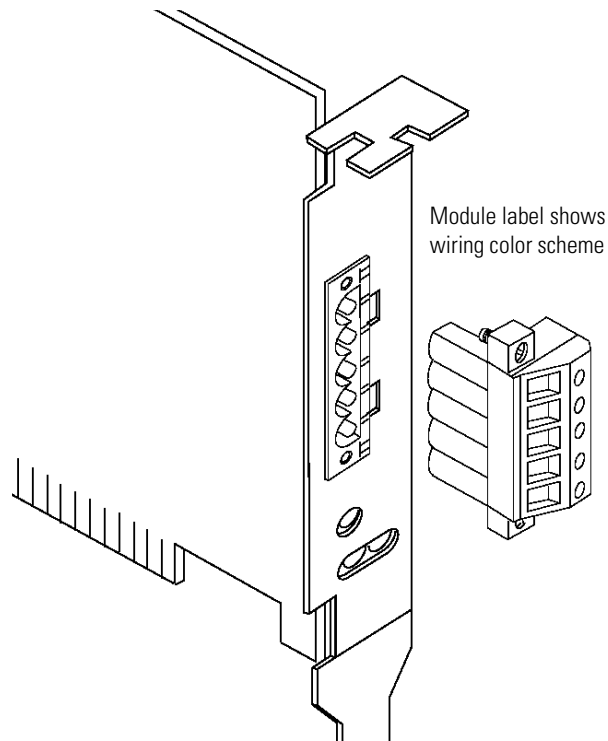
1. Connect the DeviceNet drop line to the 5-pin DeviceNet connector provided with the card. Match the wire insulation colors to the colors shown on the label.



Wire Color	Symbol	Description
Black	V-	24V DC power return
Blue	CAN_L	Data Low - Data Line
Bare	DRAIN	Shield
White	CAN_H	Data High - Data Line
Red	V+	+24V DC

2. Locate the DeviceNet port on the card.

3. Insert the DeviceNet connector into the five-pin header.



4. Apply power to the DeviceNet network, and turn on the computer to make sure it powers up correctly.

IMPORTANT

If the computer does not power up correctly, check to make sure that the card is correctly inserted into the slot. Also check the computer's BIOS settings (Interrupts, etc.) to make sure the card is not in conflict with another device.

5. Replace the CPU cover (when computer comes up correctly).

This completes the installation of the 1784-PCIDS card. Refer to chapter 4 for information on configuring the 1784-PCIDS driver software.

Installing the RediSTATION Operator Interface

Begin installing the RediSTATION by setting the DIP switches as follows:

Set this position	To this value	
1	1	On
2	1	On
3	1	On (node address ¹)
4	0	Off
5	0	Off
6	0	Off
7	0	Off (data rate ²)
8	1	On
9	0	Off
10	0	Off

¹The DeviceNet address is 000111 (node 7).

²The data rate is 10 (500k baud).

The output fault state is 0 (outputs turned off).

The output flash mode is 0 (do not flash).

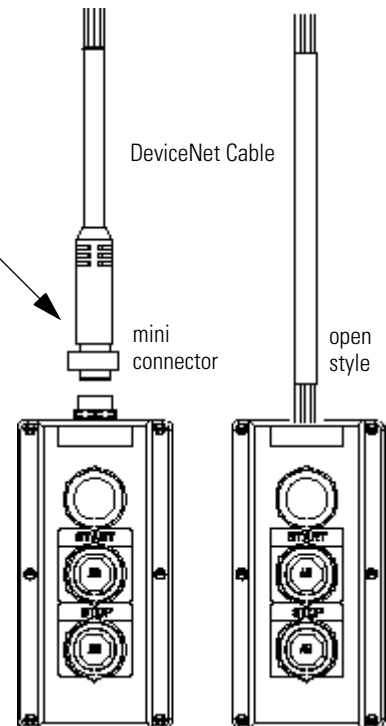
See Chapter 2 of the RediSTATION Operator Interface User Manual, publication 2705-804, for complete information about setting the DIP switches to configure the node address, data rate, output flash rate, and output fault state.

Refer to the following illustration as you connect the RediSTATION to the network.

TIP

If using a mini-connector you do not need to disconnect incoming power from the DeviceNet network before connecting the RediSTATION.

The DeviceNet cable connects directly to the mini connector on the top of the RediSTATION enclosure or through the conduit opening (open style).

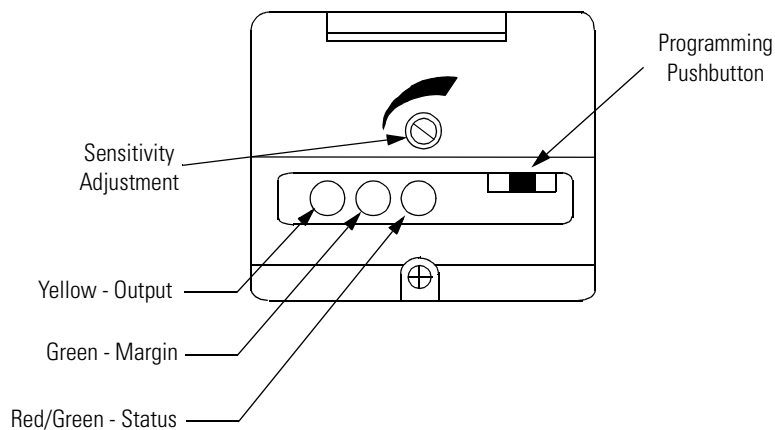


Installing the Series 9000 Photoeye

Connect the photoeye to the network and configure the photoeye as follows:

- Node Address: 9
- Operating Mode: Light Operate (default)
- Baud Rate: 500k baud

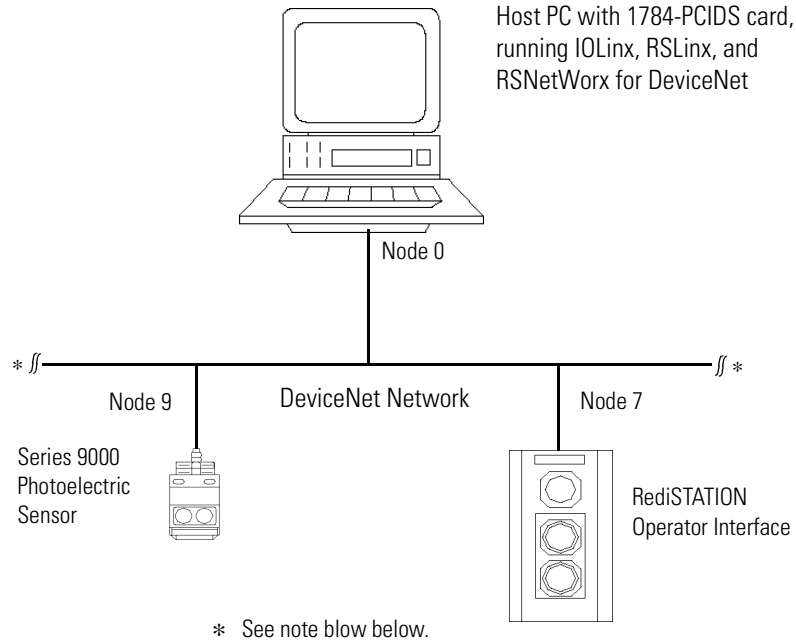
Top View of Series 9000 Photoeye



The factory default settings for Series 9000 photoeyes are node address 63, light operate, and 125k baud rate. For directions on how to use the programming pushbutton to set the node address and baud rate, refer to the instructions that ship with your photoeye.

How the Example System Should Look

The examples in this manual are based on a system consisting of a host platform connected to the DeviceNet network via the 1784-PCIDS card, a series 9000 photoeye, and a RediSTATION. When you have finished installing all of your devices, your system should appear similar to that shown below.



IMPORTANT

Make sure **each end** of your DeviceNet trunk cable is properly terminated with a resistor. Refer to the DeviceNet Cable Planning and Installation Manual, publication DN-6.7.2 for detailed information.

What's Next?

The next step is to configure the 1784-PCIDS card and perform I/O data mapping using RSNetWorx for DeviceNet software.

Configuring the DeviceNet Network

What This Chapter Contains This chapter describes how to configure the DeviceNet network using RSLinx and RSNetWorx for DeviceNet software. The following table describes where to find specific information. Note that if you need further information, detailed tutorials are provided with the software.

For information about	See page
Required Software	4-1
Installing the Software	4-2
Configuring the RSLinx 1784-PCIDS DeviceNet Driver	4-2
Configuration Screen Map	4-7
Setting Up an Online Connection	4-8
Configuring the I/O Devices	4-10
Verifying the Photoeye Configuration	4-14
Verifying the RediSTATION Configuration	4-15
AutoMapping the Devices into the Scanlist	4-16
Downloading the Configuration to the Scanner	4-19

Required Software

The example network described in this manual requires the following Rockwell software. You must install RSLinx before installing the other two software packages.

1. RSLinx (must be installed first)
2. IOLinx (shipped with the 1784-PCIDS scanner card)
3. RSNetWorx for DeviceNet (to configure the network)

Installing the Software

IMPORTANT

We strongly recommend that you exit all Windows programs before running the Setup programs.

To install Rockwell software products from a CD, use the following procedure:

1. Insert the setup CD in the CD-ROM drive.

Note: The setup CD-ROMs support Windows Autorun. Once inserted into the CD-ROM drive, the installation will automatically start at the first setup screen if you have Autorun enabled.

If Autorun is enabled for your CD-ROM drive, go to step 5.

2. From the **Start** menu, choose Run.

You will see the Run pop-up window.

3. Type **d:\setup** (if it doesn't appear automatically), where **d:** is your CD-ROM driver letter.

4. Click on **OK**.

You will see the progress bar, followed by the welcome screen.

5. Follow the prompts on the screen as you set up your software.

Configuring the RSLinx 1784-PCIDS DeviceNet Driver

RSNetWorx for DeviceNet uses the RSLinx 1784-PCIDS driver to communicate with the devices on the DeviceNet network. In order to use this driver you must first:

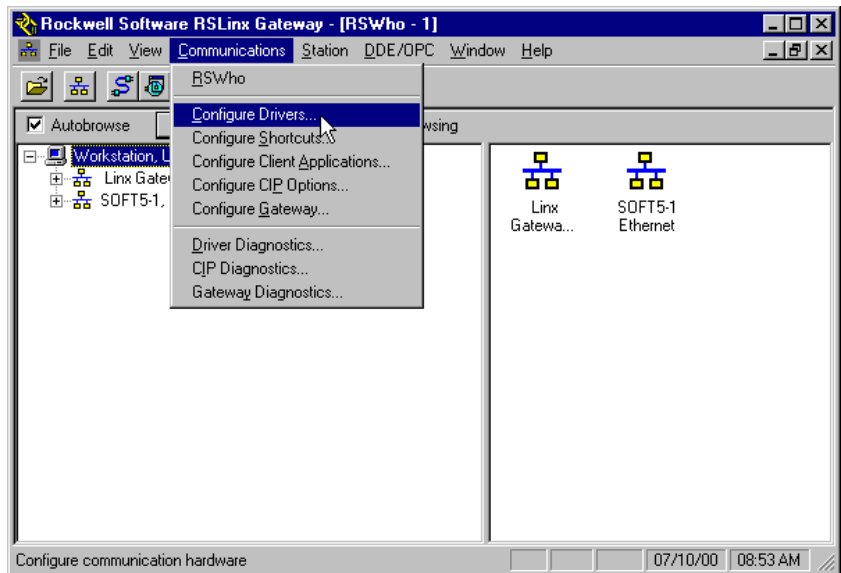
1. Install the driver from the runtime IOLinx CD-ROM supplied with the card.
2. Configure the DeviceNet port and driver in RSLinx.

IMPORTANT

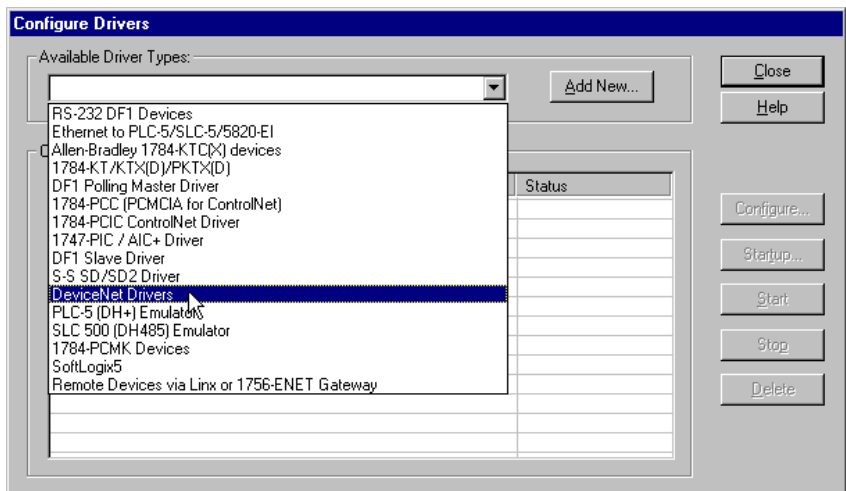
You must install the PCIDS driver from the runtime IOLinx CD-ROM supplied with the card **before** you can configure the port and driver.

Use the following procedure to configure the RSLinx 1784-PCIDS driver for use with RSNetWorx for DeviceNet:

1. Start **RSLinx**.

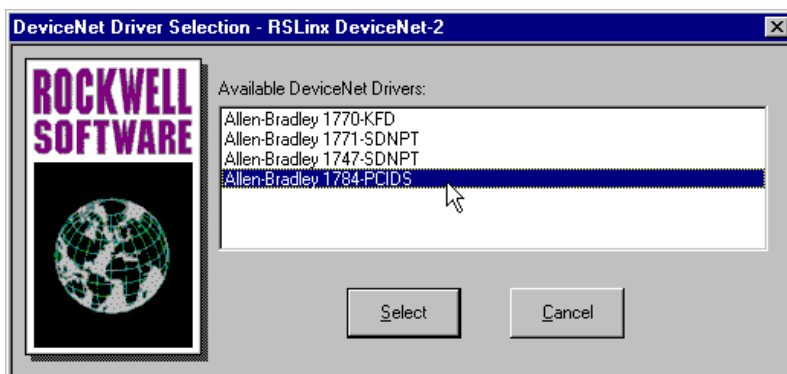


2. From the **Communications** menu, select **Configure Drivers**.
The **Configure Drivers** window will open.



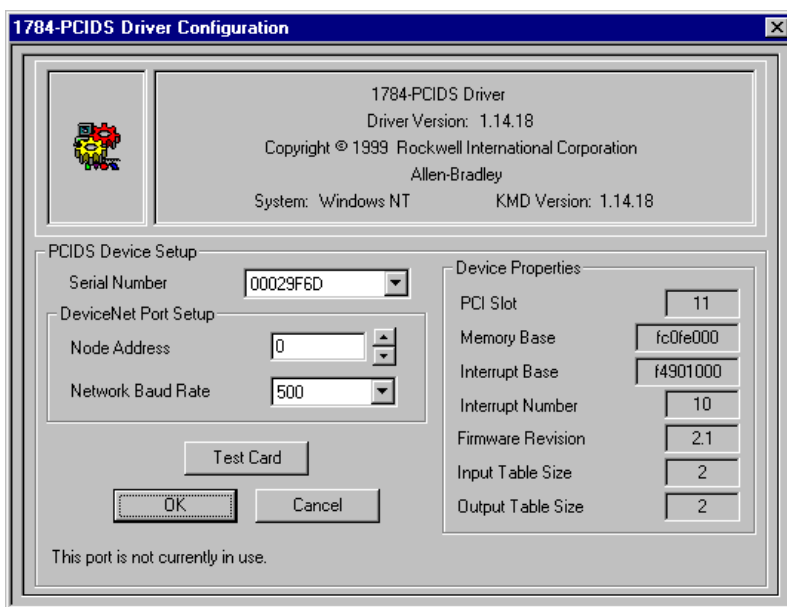
3. From the list of **Available Driver Types**, select **DeviceNet Drivers** and click on **Add/New**. You will see the **DeviceNet Driver Selection** window with the drivers available on your machine.

Note: If the 1784-PCIDS driver does not appear in your list, the PCIDS driver did not install properly from the IOLinx CD-ROM.



4. Highlight the **Allen-Bradley 1784-PCIDS** driver and click on **Select**.

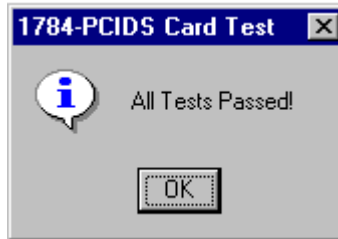
The **1784-PCIDS Driver Configuration** window will open.



Note: If you have multiple PCIDS cards installed for your application, use the **Serial Number** pulldown window to select the PCIDS you want to configure. Check the **PCI Slot** number to make sure you have selected the right card.

5. Click on **Test Card**.

You should receive the following message.



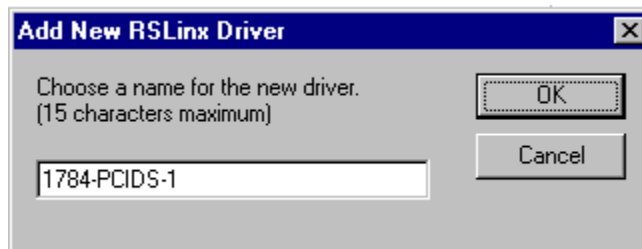
If the tests fail you have a hardware problem in your computer. The card may be defective, improperly seated in its slot, etc. Note that these are simply basic hardware tests on your machine and do not indicate a network problem. (The card does not have to be configured or connected to the network to perform the tests.)

6. Click on **OK**.

IMPORTANT

Your DeviceNet network must be connected and powered up before continuing.

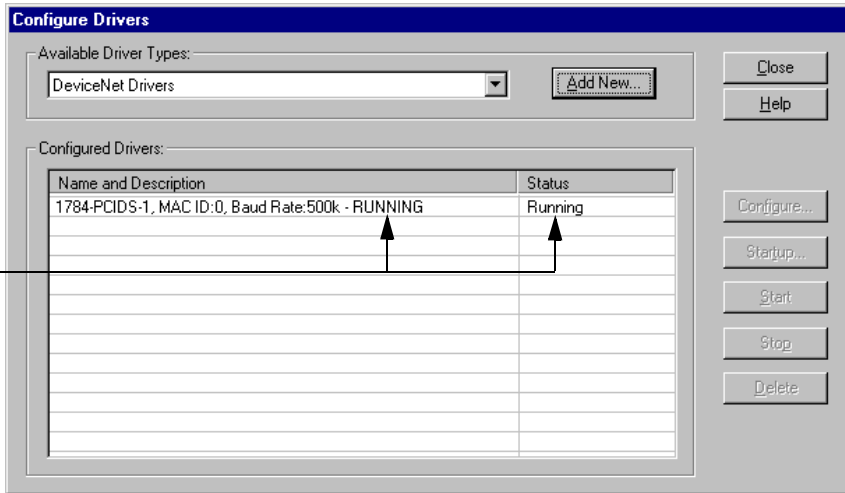
7. In the **DeviceNet Port Setup** area of the Driver Configuration window, make sure the **Node Address** and **Network Baud Rate** are correct (we used Node Address 0 and a Baud Rate of 500K for the example network).
8. Click on **OK**. You will be prompted to choose a name for the new RSLinx driver.



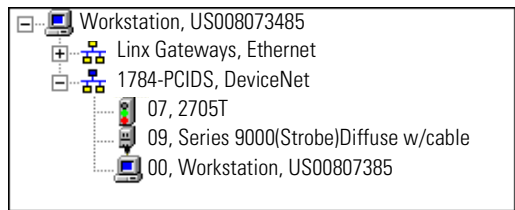
9. Accept the default name (1784-PCIDS-1) and click on **OK**.

The new driver will be added to the list of configured RSLinx drivers. (Your screen will display the drivers you have configured on your system.)

The driver's Status should be "Running". If not, there is a problem. Check the physical connection to the PCIDS card. If the physical connection is intact, verify the network baud rate and ensure that the PCIDS card's node number is unique. Also check the external 24V power connections. The Network LED on the 1784-PCIDS card should be solid or flashing green.



10. From the **Communications** menu select **RSWho**. Expand the tree under the 1784-PCIDS driver and make sure that you see all of the devices on the network.



TIP



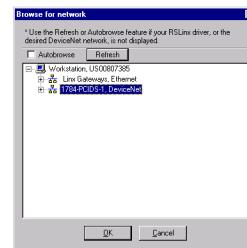
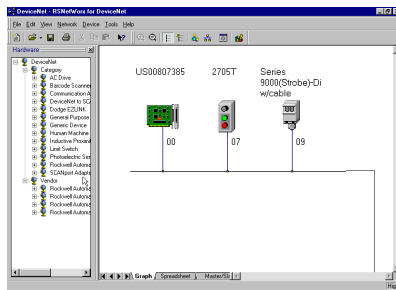
If RSLinx fails to find a device, check the physical connection to the device. If the physical connection is intact, verify the device's baud rate and ensure that its node number is unique. Also check the external power connections to the device. The Network LED on the 1784-PCIDS card should be solid or flashing green.

11. Close RSLinx.

Configuration Screen Map

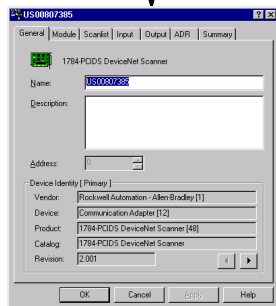
The configuration screen map below shows the RSNetWorx for DeviceNet screens used to configure the 1784-PCIDS card and the navigation paths between them. The use of these screens is described in the following sections.

The main **RSNetWorx for DeviceNet** screen.

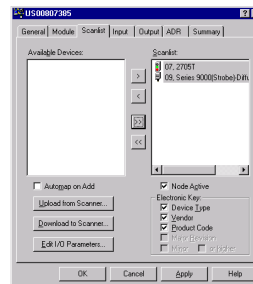


To browse the network, click on the Online or Browse buttons and select the driver. If no PCIDS driver is seen, refer to page 4-2 for information on configuring a driver.

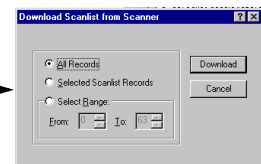
To access the 1784-PCIDS card, double-click on the 1784-PCIDS icon.



To access the scanlist, click on the Scanlist tab. If online you will be prompted to upload or download the scanlist.

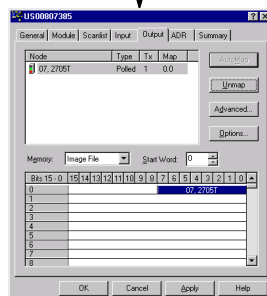
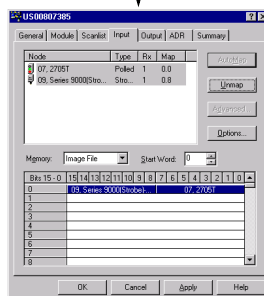


To download the scanlist, go online and click on the Download to Scanner button.

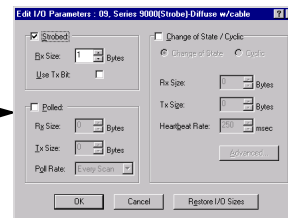


To manually map input devices, select the Input tab.

To manually map output devices, select the Output tab.



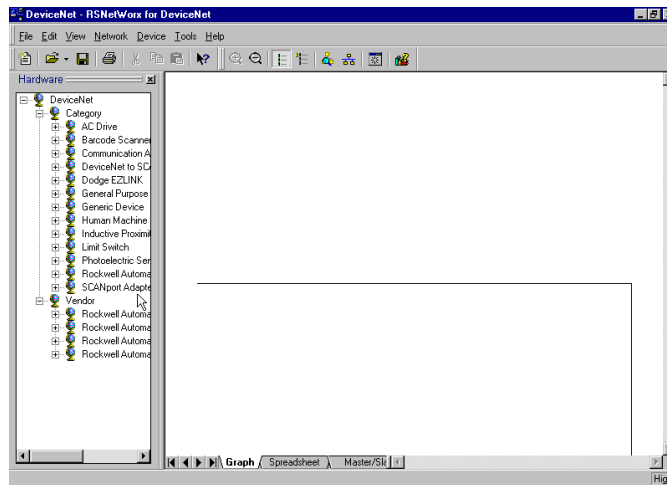
To edit a device's I/O parameters, double-click on the device in the scanlist.



Setting Up an Online Connection

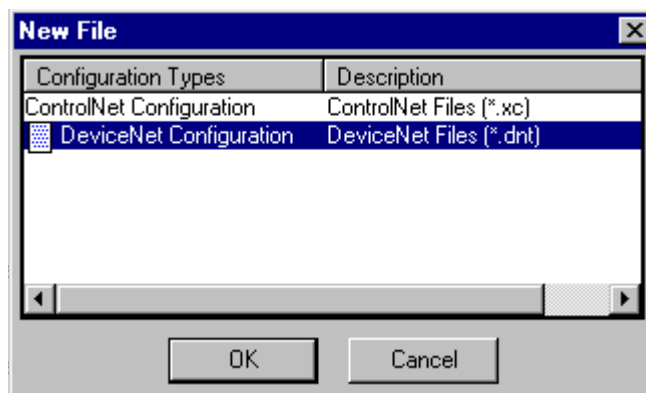
Follow the procedure below to set up an online connection to the DeviceNet network using the 1784-PCIDS driver.

1. Start **RSNetWorx for DeviceNet**.



2. From the **File** menu, select **New**.

If you have RSNetWorx for ControlNet installed on your computer you may see the following window. Otherwise, proceed to step 4.

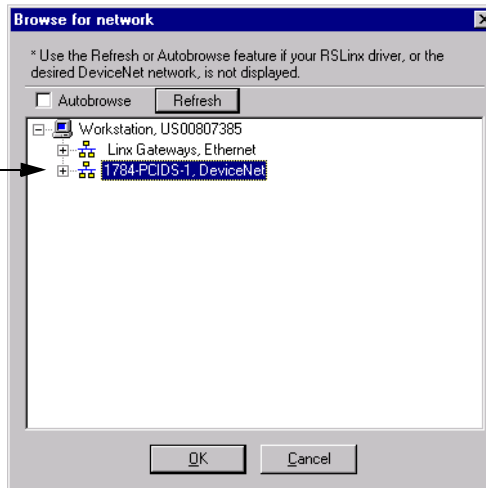


3. Highlight **DeviceNet Configuration** and click on **OK**.

4. Click on the **Online** button on the toolbar.

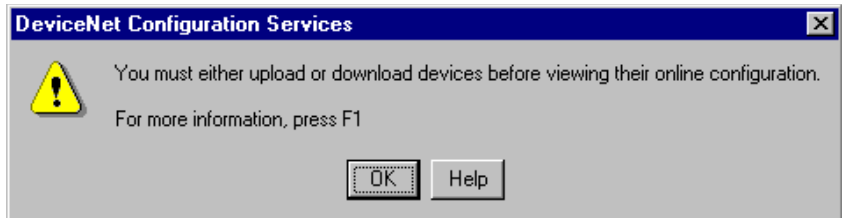
The **Browse for network** window will appear. You will see the drivers you have configured on your system.

If you do not see the 1784-PCIDS driver, refer to page 4-2.



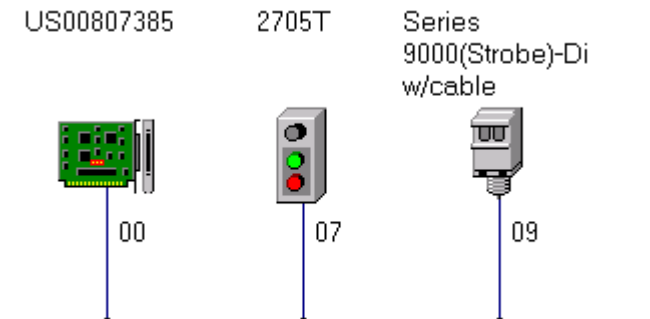
5. Select the **1784-PCIDS, DeviceNet** driver and click on **OK**.

You will be prompted that you will have to upload or download devices before viewing their online configuration.



6. Click on **OK** to go online and browse the network.

RSNetWorx for DeviceNet will begin browsing for network devices. When the software is finished browsing, the network displayed on your screen should look similar to the one shown below.



TIP

By default, RSNetWorx for DeviceNet performs a one-shot browse when you go online or choose the browse feature. The software will poll for devices once and display the results. Consequently, there will be no “live” indication if a node which was online later goes offline or if a new node comes online.

- Check the **Autobrowse** box if you want the software to browse and update continuously.
- You can also manually perform a browse at any time by pressing the browse button .

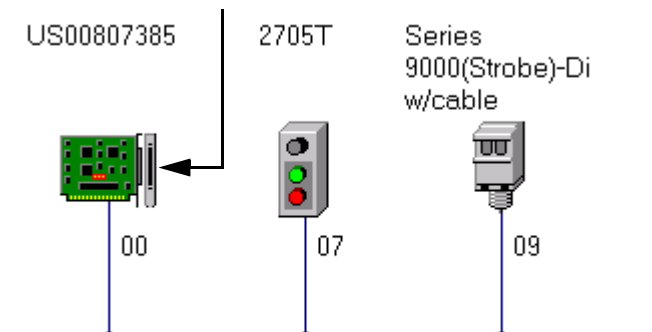
Configuring the I/O Devices

Next you must add the RediSTATION and the photoeye to the 1784-PCIDS scanlist, configure and/or verify their parameters, and map the devices to the scanner’s memory.

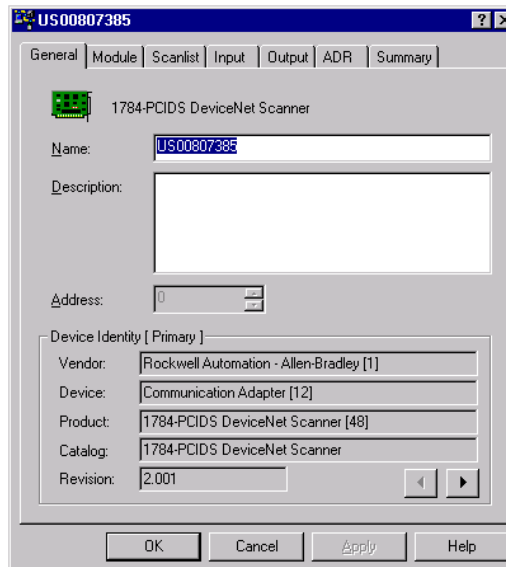
IMPORTANT

Always do an upload of the entire network to preserve existing configurations before configuring new devices or reconfiguring existing devices.

1. Double-click on the **1784-PCIDS** module icon.



The following window will appear:



2. Select the **Module** tab.

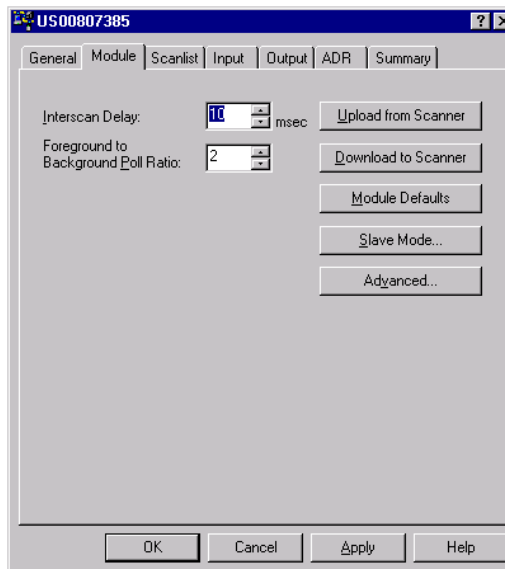
You will be prompted to upload or download the configuration.



3. Click on **Upload**.

Note: You could also have done an offline configuration of the PCIDS card. In that case, you would select **Download**.

After uploading the **Module** property page will open:



On the 1784-PCIDS Module property page you can configure scanner parameters online. The module parameters (**Interscan Delay**, **Poll Ratio**, **Packet Rate**, and **Transmit Retries**) determine how the 1784-PCIDS DeviceNet scanner communicates with other devices on the DeviceNet network.

The factory defaults for the **Packet Rate** and **Transmit Retries** are the optimum values for most applications. Since these parameters are not used frequently, they do not appear on this property page. You access them by clicking the **Advanced** button. We do not recommend changing these unless there is a need to do so.

TIP



For an explanation of each module parameter, use the context-sensitive help on this property page, and on the Advanced Module Settings and Slave Mode dialog boxes.

4. Select the **Scanlist** tab.

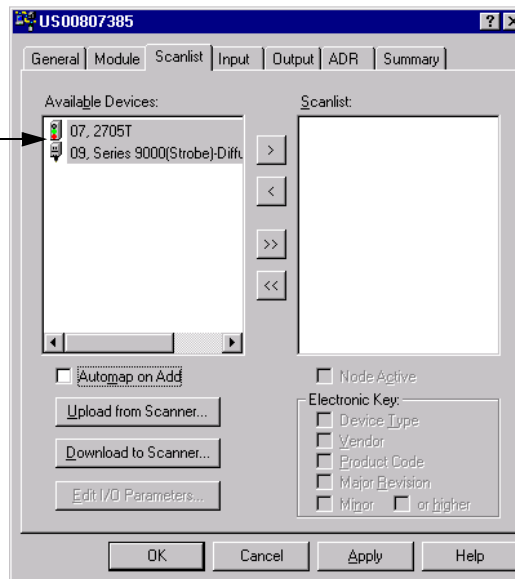
The **Scanlist** page will appear with the RediSTATION and the photoeye in the list of **Available Devices**.

TIP

If the devices do not appear, go back and browse the network again to make sure they are present.

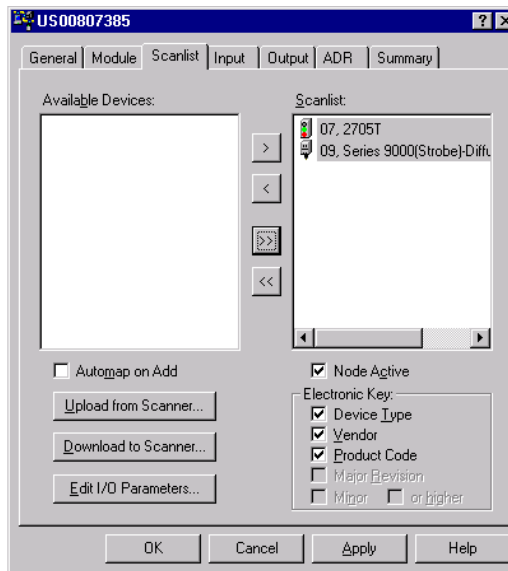


RediSTATION and photoeye should appear in the list of Available Devices.



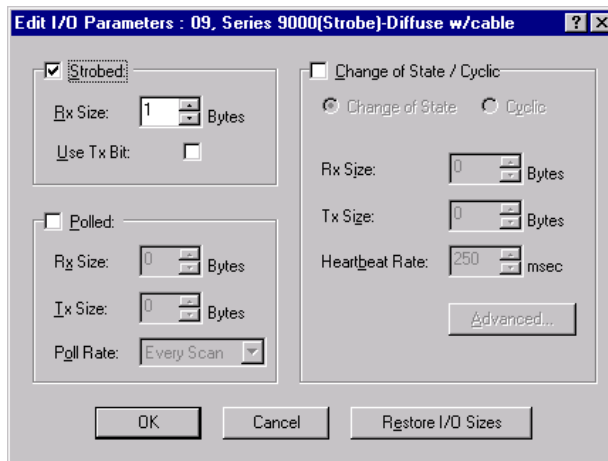
5. For this example, uncheck the **Automap on Add** box, as shown above. We will do this mapping later.
6. Click on the double arrow  button to add the photoeye and RediSTATION to the Scanlist.

The photoeye and the RediSTATION will appear in the Scanlist in the right panel of the window.



Verifying the Photoeye Configuration

1. Double-click on the **photoeye** in the Scanlist. The **Edit I/O Parameters** window will appear for the photoeye.



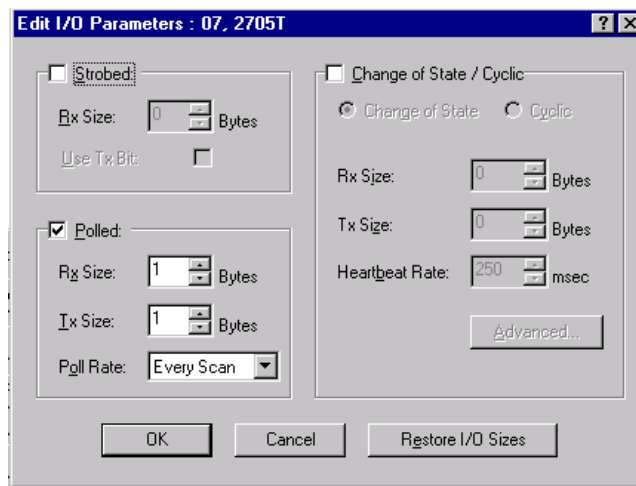
The I/O parameters define the configuration for the device in terms of how much and with what data transmission format the device will exchange data with the 1784-PCIDS module. By default, the photoeye will send 1 byte when it receives a strobe request.

2. Verify that the photoeye parameters are set as shown above.

3. Click on **OK** if you made any changes and close the photoeye **Edit I/O Parameters** window.

Verifying the RediSTATION Configuration

1. Double-click on the **RediSTATION** in the Scanlist window. The Edit I/O Parameters window will appear for the RediSTATION.



2. Make sure that the **Polled** box is checked and that the **Rx Size** and **Tx Size** are each 1 byte.
3. Click on **OK** if you made any changes and close the Edit I/O Parameters window for the RediSTATION.

AutoMapping the Devices into the Scanlist

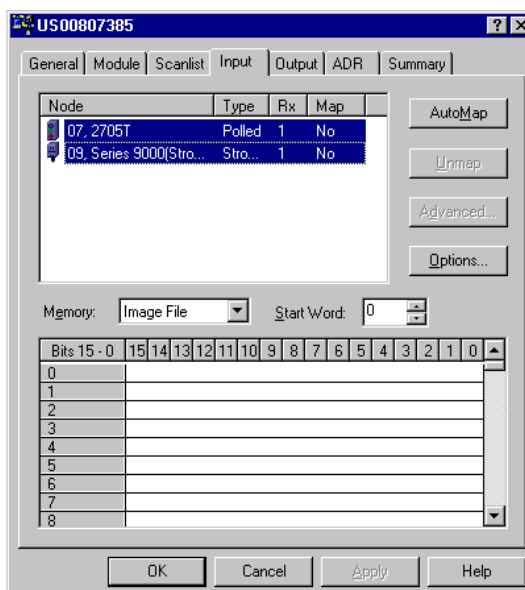
Follow the procedure below to automatically map the photoeye and RediSTATION to the personal computer.

TIP



If you want to know how to map the devices manually, click on the **Help** button at the bottom of the screen and select “Map device input data manually.”

1. Select the **Input** tab. You will see the following window.



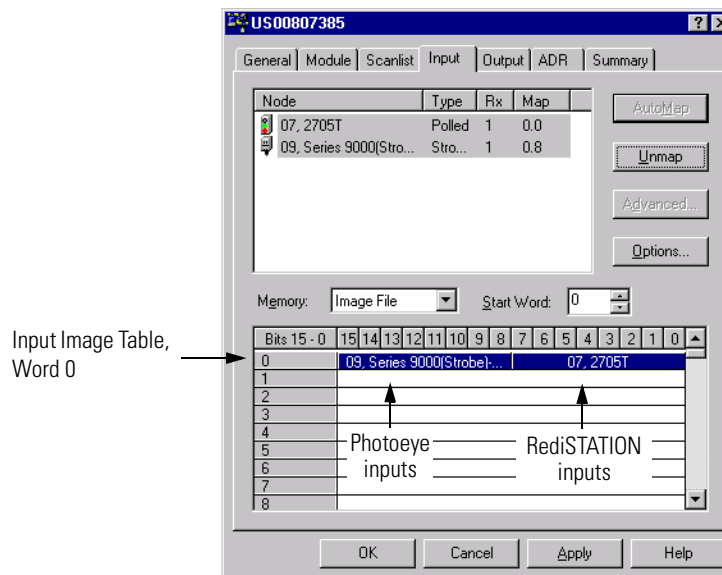
Input data is read from input image tables. Mapping to and from these tables is done as a word index, offset from zero. There is no reserved status or command bytes in the mapped image tables.

The **Options** button provides you the option of aligning the data on byte or word boundaries.

This **Advanced** button allows you to specify the mapping parameters manually if so desired.

2. Highlight the RediSTATION and the photoeye and click on the **AutoMap** button.

The resulting device mapping will appear in the lower panel of the window:



In this example, the input byte from the RediSTATION will appear in the Input Image Table in word 0, as bits 0-7. Recall from chapter 2 that the START button is bit 1 and the STOP button is bit 0. Therefore, the addresses for the RediSTATION inputs are:

START: Word 0, bit 1

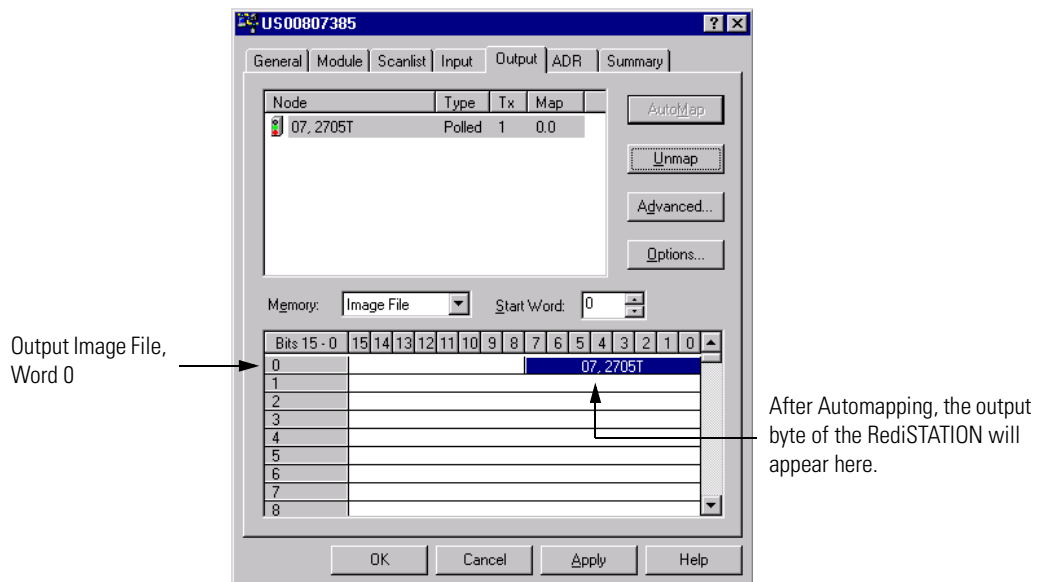
STOP: Word 0, bit 0

The input byte from the photoeye will appear in the Input Image Table as word 0, bits 8-15. Recall from chapter 2 that the input bit is bit 0. Therefore, the address of the photoeye input is:

Word 0, bit 8

- Note the input mapping assigned to the START and STOP buttons and the photoeye in your system.** You will need this mapping for your application. (See Appendix B for an example of using this mapping in a SoftLogix 5 program.)

4. Select the **Output** tab.



5. Highlight the RediSTATION and click on the **AutoMap** button.

In this example, the output to the RediSTATION appears in the Output Image File as Word 0, bits 0-7. Recall from chapter 2 that the indicator light is output bit 0. Therefore, the address for the RediSTATION's indicator light is:

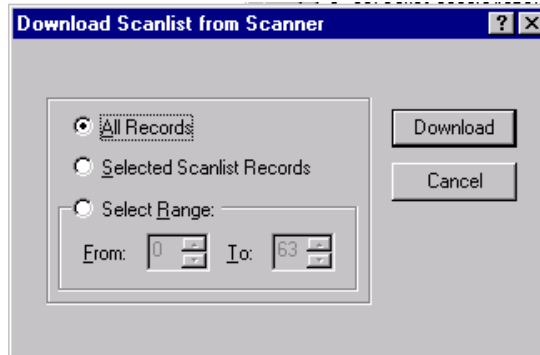
Word 0, bit 0

6. **Note the output mapping assigned to this output in your system.** You will need this mapping for your application. (See Appendix B for an example of using this mapping in a SoftLogix 5 program.)

Downloading the Configuration to the Scanner

1. Click on the **Scanlist** tab and then on the **Download to Scanner** button.

You will see this window:



2. Select **All Records** and click on the **Download** button to download the configuration to the 1784-PCIDS scanner card.

IMPORTANT

Your application must not be running when downloading to the scanner card.

3. Click on the **OK** button to complete the DeviceNet scanner configuration.

Note: The Network Status LED on the photoeye will turn solid green to indicate that the photoeye has been configured.

4. Close the Scanlist window.
5. Select the **Save as** option from the RSNetWorx for DeviceNet **File** menu, and save the DeviceNet configuration, using an appropriate name, e.g., **1784-PCIDS.dnt**.
6. **Close** or **minimize** RSNetWorx for DeviceNet.

What's Next?

The next chapter describes how to test the DeviceNet network using the IOLinx runtime software supplied with the card.

Using IOLinx To Test the Example Network

What This Chapter Contains

This chapter describes how to use the IOLinx runtime software supplied with the 1784-PCIDS card to test the example DeviceNet network. The following table describes where to find specific information.

For information about	See page
Using IOLinx to Configure the 1784-PCIDS Port	5-1
Testing the DeviceNet Network	5-4
Testing the RediSTATION and Photoeye Inputs	5-7
Testing the RediSTATION Output	5-8
Using the IOLinx Device Status Screen	5-6

Using IOLinx to Configure the 1784-PCIDS Port

Included with the IOLinx for 1784-PCIDS driver is a stand alone test application (DNetTest.exe) that can be used to diagnose simple problems over the network. The test application is automatically installed as part of the driver installation procedure. You can also use this test application to configure the DeviceNet port on the 1784-PCIDS card, instead of using RSLinx as described in chapter 4. The procedures are almost identical.

TIP

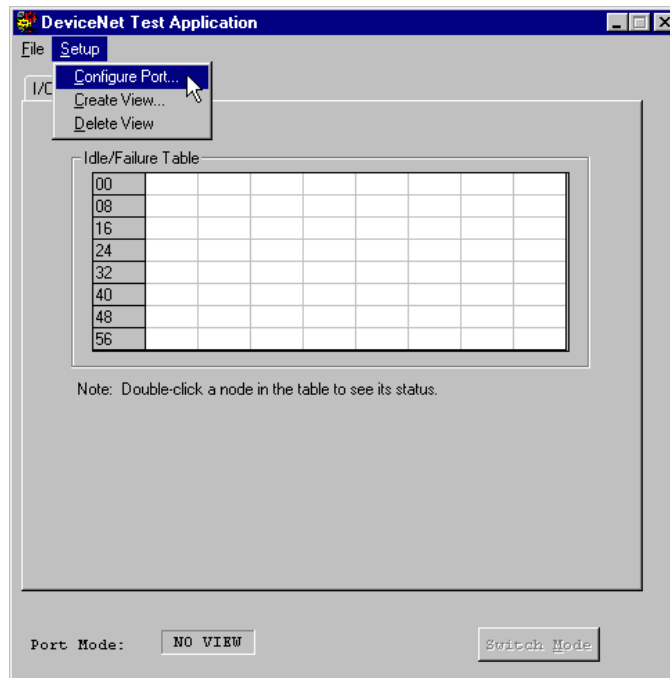


The port configuration is stored in the Windows system registry. If you have already created a port for the card (e.g., using RSLinx), you can skip this section and proceed to **Testing the DeviceNet Network** on page 5-4.

To configure the DeviceNet port perform the following steps:

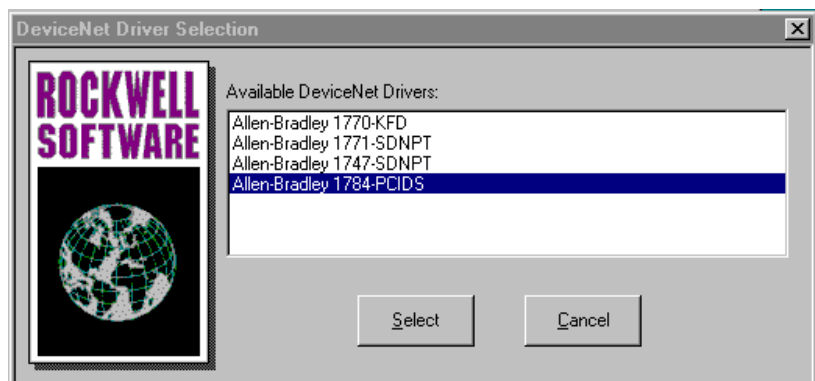
1. Start the DeviceNet test program (path = Start → Programs → Rockwell Software → IOLinx → IOLinx for DeviceNet → DNetTest.

The **DeviceNet Test Application** window will open.



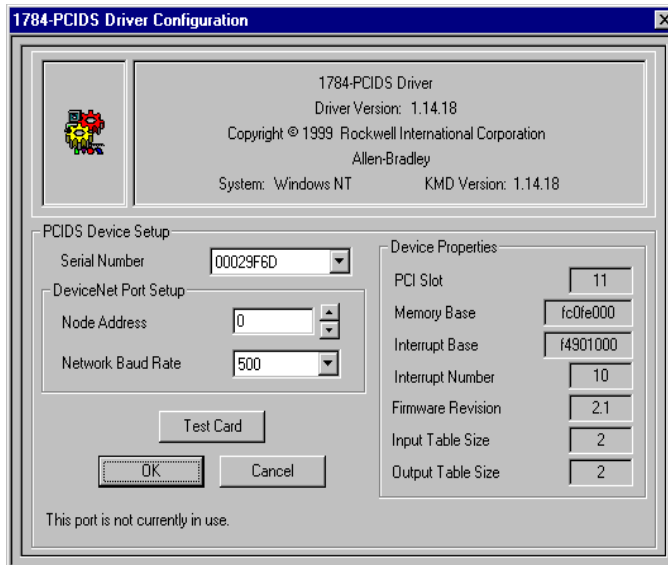
2. From the **Setup** menu, select **Configure Port**. You will see your machine's available DeviceNet Driver Selections.

Note: If the 1784-PCIDS driver does not appear in your list, the driver did not install properly from the IOLinx CD-ROM.



3. Highlight the **Allen-Bradley 1784-PCIDS** driver and click on **Select**.

The **1784-PCIDS Driver Configuration** window will appear.

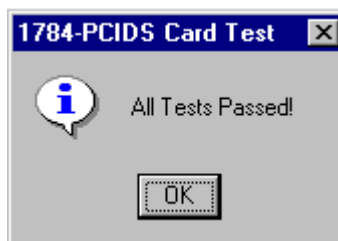


4. In the **DeviceNet Port Setup** area, make sure the **Node Address** and **Network Baud Rate** are correct (we used Node Address 0 and a Baud Rate of 500K for the example network).

Note: If you have multiple PCIDS cards installed in your computer for your application, use the **Serial Number** pulldown window to select the PCIDS you want to configure.

5. Click on **Test Card**.

You should receive the following message.



If the tests fail you have a hardware problem in your computer. The card may be defective, improperly seated in its slot, etc. Note that these tests are simply basic hardware tests on your machine and do not indicate a network problem. The card does not have to be configured or connected to the network to perform the tests.

6. Click on **OK** to acknowledge the “All Tests Passed!” message.
7. Click on **OK** to accept the driver configuration.

You will receive the following message.



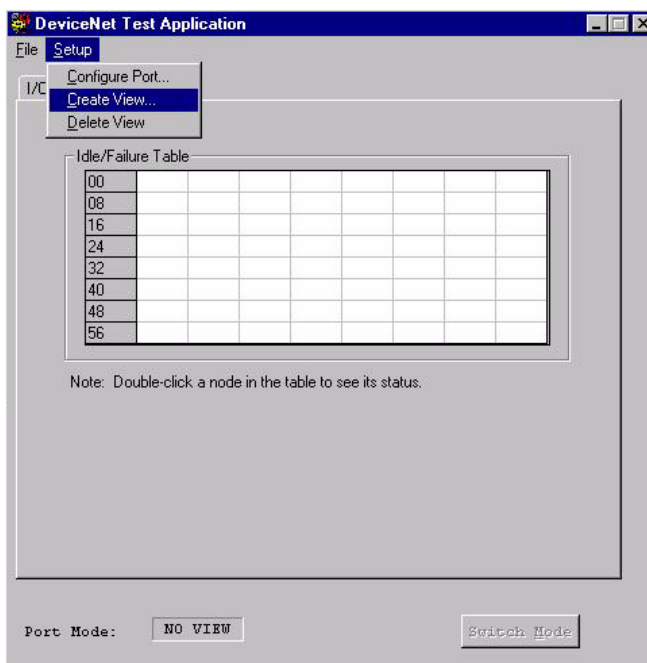
8. Click on **OK**.

Testing the DeviceNet Network

To test the example network using the DNetTest program, perform the following steps:

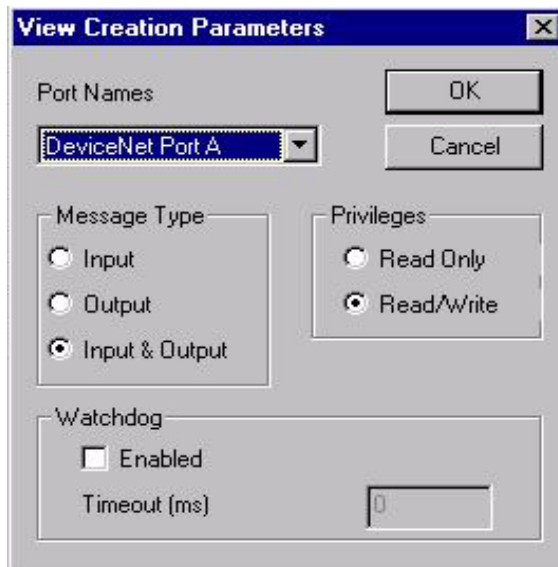
1. Start the DeviceNet test program (path = Start → Programs → Rockwell Software → IOLinx → IOLinx for DeviceNet → DNetTest).

The **DeviceNet Test Application** window will open.



2. From the **Setup** menu select **Create View**.

The **View Creation Parameters** window will open.



3. In the **Port Names** field, select your 1784-PCIDS card's port (e.g., "DeviceNet Port A").

Note: You must use the down arrow on your keyboard to scroll through the list of Port Names.

4. Under the **Message Type** select **Input & Output**.
5. Under **Privileges** select **Read/Write**.
6. Click on **OK**.

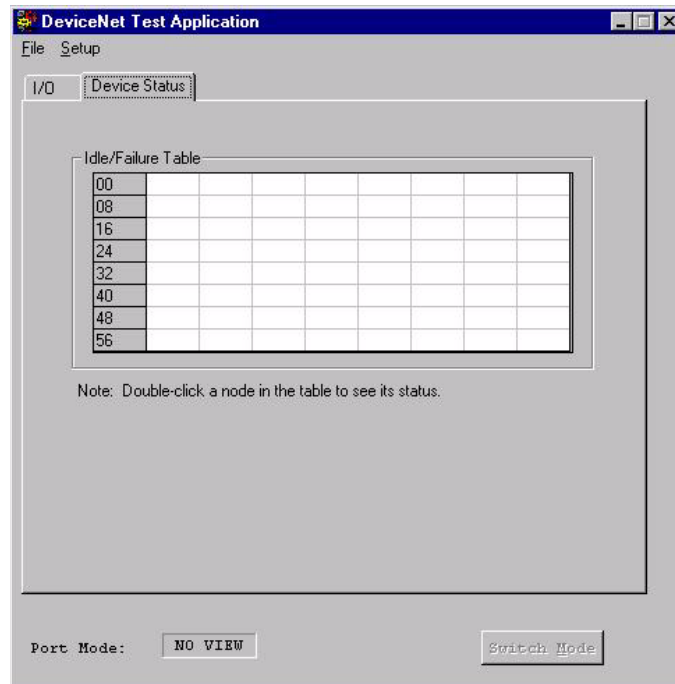
You will see the following message.



7. Click on **OK**.

Using the IOLinx Device Status Screen

The **Device Status** screen displays an Idle/Failure Table where you can double-click on a node to see its status, including MAC ID, status code, and status info (e.g., device stopped communicating).



Make sure that there are no failures (“F”) indicated for the devices on your network (e.g., the 1784-PCIDS card at node 0, the RediSTATION at node 7, and the photoeye at node 9). If you do see an “F”, double-click on it to read the error message.

Note: If you double-click on an empty node, you see the response “OK or not in scan list.”

Testing the RediSTATION and Photoeye Inputs

Click on the I/O tab to view the 1784-PCIDS card's input and output image tables. The contents of the tables are shown as hexadecimal numbers.

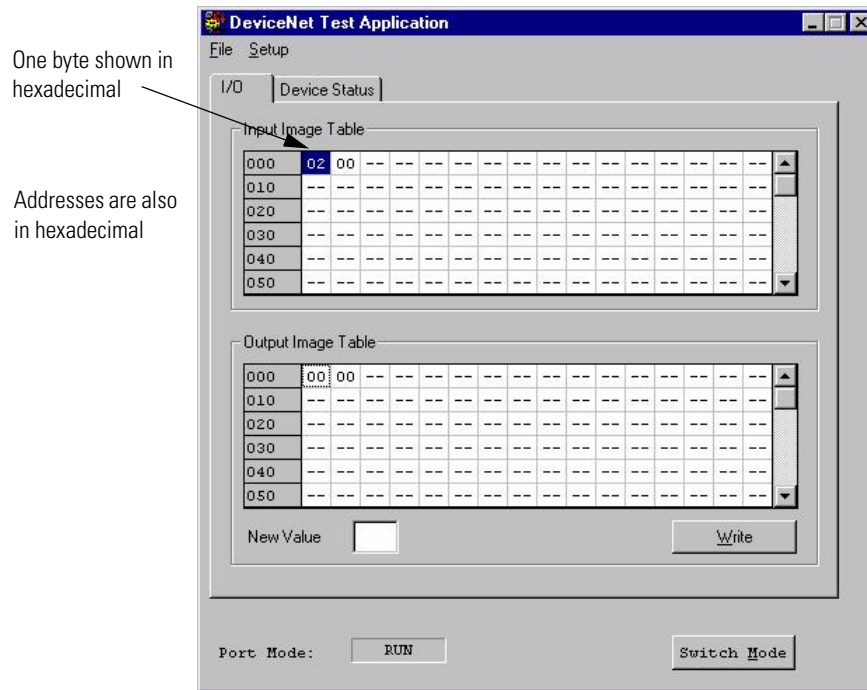
Recall from chapter 5 that the RediSTATION inputs are mapped as follows:

START: Word 0, bit 1

STOP: Word 0, bit 0

The photoeye input is mapped to:

Word 0, bit 8

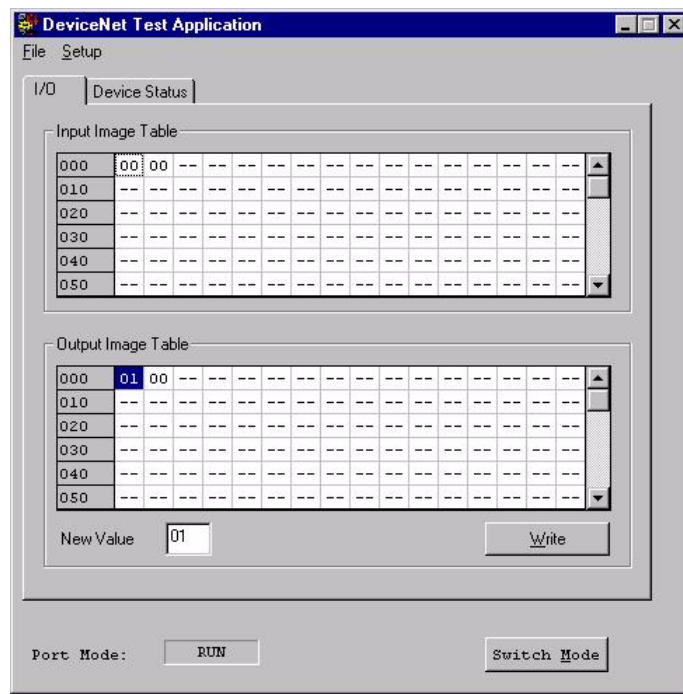


1. Use the **Switch Mode** button to change the scanner's mode from **IDLE** to **RUN**.
2. Repeatedly press and release the **START** button on the RediSTATION. On your screen, you should see input byte 0 changing back and forth from "0" to "2" as bit 1 sets and resets when you press and release the button.
3. Repeatedly press and release the **STOP** button on the RediSTATION. On your screen, you should see input byte 0 changing back and forth from "0" to "1" as bit 0 sets and resets when you press and release the button.

4. Pass your hand back and forth over the photoeye several times. On your screen you should see input byte 1 toggling back and forth between “0” and “1” as the photoeye input turns on and off.

Testing the RediSTATION Output

Recall from Chapter 5 that the RediSTATION's indicator light is mapped to Output Word 0, bit 0.



1. If the scanner is not in **RUN** mode, use the **Switch Mode** button to change the scanner's mode from **IDLE** to **RUN**.
2. Select byte 0 from the Output table, type in a “1” in the **New Value** field and click on the **Write** button. The red indicator light on the RediSTATION should turn on.
3. Select byte 0 from the Output table, type in a “0” in the **New Value** field and click on the **Write** button. The red indicator light on the RediSTATION should turn off.

WARNING

If you perform a Write test to a device on your network be certain that you are writing to the correct location and that you are aware of the possible results of writing to that device. Failure to observe these precautions could result in unexpected machine motion, property damage, or injury to personnel.

This completes the IOLinx test of your network.

Diagnostics and Troubleshooting

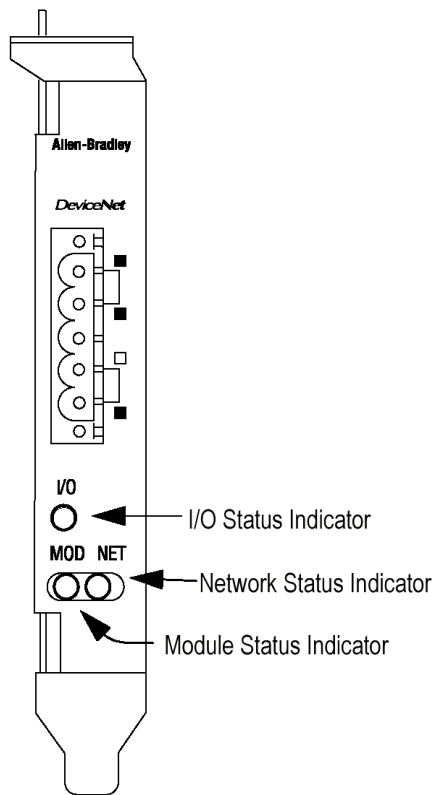
What This Appendix Contains

The 1784-PCIDS communication interface card has three LED diagnostic indicators. The diagnostics provided by these indicators are described in this appendix.

For information about the	See page
I/O Status Indicator	A-1
Module (MOD) Status Indicator	A-2
Network (NET) Status Indicator	A-2

I/O Status Indicator

The bicolor (green/red) I/O Status LED provides information concerning the states of inputs and/or outputs.



I/O Status Indicator

Condition	Status	Indicates
off	output(s) inactive input(s) inactive	• All outputs are inactive. • All inputs are inactive.
green	output(s) active input(s) active	• One or more outputs are active and under control, and no outputs are "faulted." • One or more inputs are active and producing data, and no inputs are "faulted."
flashing green ⁽¹⁾	output(s) idle	• One or more outputs are idle and no outputs are active or "faulted."
flashing red ⁽¹⁾	output(s) faulted input(s) faulted	• One or more outputs are "faulted," and may be in the fault state. • One or more inputs are "faulted," and may be in the fault state.
red	output(s) forced off input unrecoverable fault	• One or more outputs are forced off (may be an unrecoverable fault). • One or more inputs has an unrecoverable fault.

⁽¹⁾ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

Module (MOD) Status Indicator

This bi-color (green/red) LED indicates whether or not the 1784-PCIDS card has power and is operating properly.

Network Status Indicator

condition	status	indicates
off	no power	No power applied to device
green	device operational	Device is operating in a normal condition.
flashing green ⁽¹⁾	device in standby (device needs commissioning)	Device needs commissioning due to configuration missing, incomplete, or incorrect. Device may be in the standby state. Refer to the DeviceNet Specification, Volume II, Identity Object.
flashing red ⁽¹⁾	recoverable fault	e.g., the device's scan list configuration does not match the actual network configuration.
red	unrecoverable fault	Device has an unrecoverable fault. Cycle power to the card by shutting down and cycling power to your computer. If the problem persists the device may need to be replaced.
flashing red-green	device self testing	Device is in self test. Refer to the DeviceNet Specification, Volume II, Identity Object.

⁽¹⁾ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

Network (NET) Status Indicator

This bi-color (green/red) LED indicates the status of the communication link

Network Status Indicator

condition	status	indicates
off	not powered, not online	Device is not online. - The device has not completed the Dup_MAC_ID test yet. - The device may not be powered; look at the Module Status LED.
flashing green ⁽¹⁾	online, not connected	The device has passed the Dup_MAC_ID test and is online, but has no established connections to other nodes.
green	link okay, online, connected	The device is online and has connections in the established state.
flashing red ⁽¹⁾	connection time-out	One or more I/O connections are in the timed-out state.
red	critical link failure	Failed communication device. The device has detected an error that has rendered it incapable of communicating on the network (Duplicate MAC ID or Bus-off). Check network integrity and baud rate of all devices. Then cycle power to the card by shutting down and cycling power to your computer.

⁽¹⁾ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

Creating and Running a SoftLogix 5 Application

What This Appendix Contains

IMPORTANT

Make sure you have completed the installation and configuration of the example DeviceNet network described earlier in this manual before creating this SoftLogix 5 application.

This appendix describes the procedure to create, download, and run a **SoftLogix 5** ladder program to test the DeviceNet network described in this manual. When the program is put into Run mode, pressing the START button on the network's RediSTATION will cause the red indicator light to come on and stay on until the STOP button is pressed. Passing an object in front of the photoeye will increment a counter.

We use **RSLogix 5** programming software to create and download the ladder program. For this example, we assume that RSLogix 5 is running on the same computer as the SoftLogix 5 controller engine. It is also possible to run RSLogix 5 on a workstation or programming terminal communicating with the SoftLogix controller over an Ethernet or Data Highway Plus network.

IMPORTANT

You must have administrative or programmer rights in SoftLogix 5 in order to create and run the example application. Check with your system administrator.

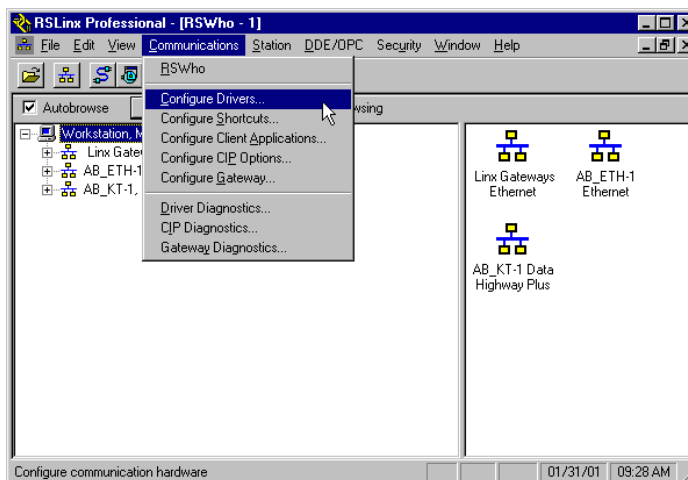
The following table describes what this appendix contains and where to find specific information.

For information about	See page
Configuring the RSLinx SoftLogix 5 Driver	B-2
Configuring the SoftLogix 5 DeviceNet Driver	B-4
Putting the SoftLogix Controller in Remote Mode	B-6
Creating the Example Application Program	B-7
Downloading the Program	B-10
Running the Example Program	B-11

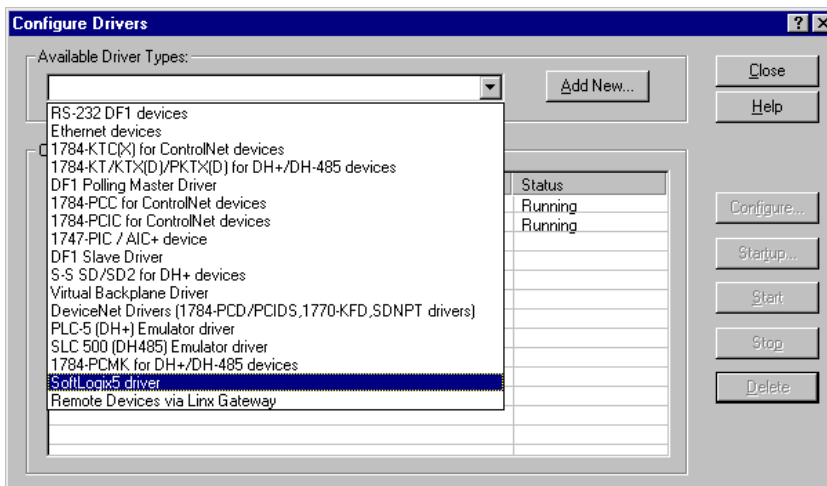
Configuring the RSLinx SoftLogix 5 Driver

In order to download or upload programs to the SoftLogix 5 controller you must configure the RSLinx SoftLogix 5 driver on the workstation where you will run RSLogix 5. To configure the driver perform the following steps:

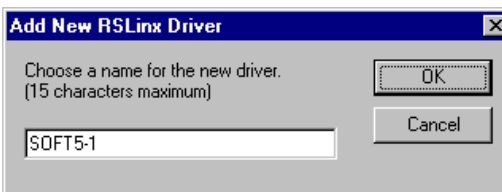
1. Start **RSLinx**.



2. From the **Communications** menu, select **Configure Drivers**. The **Configure Drivers** window will open.

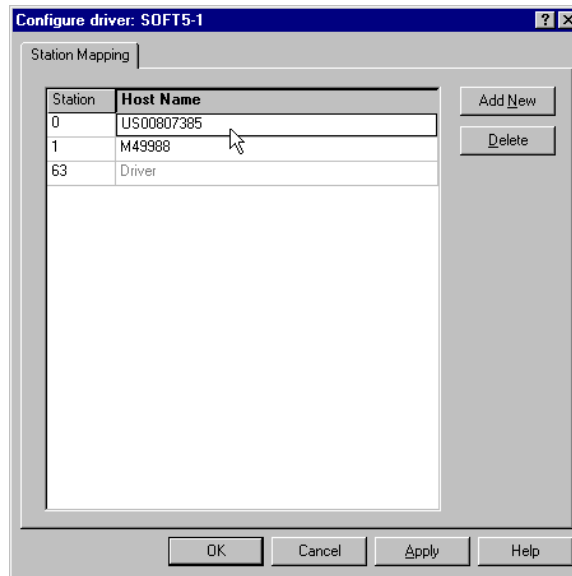


3. Select the **SoftLogix 5 driver** from the pull-down list and click on **Add/New**. You will see the following pop-up window.



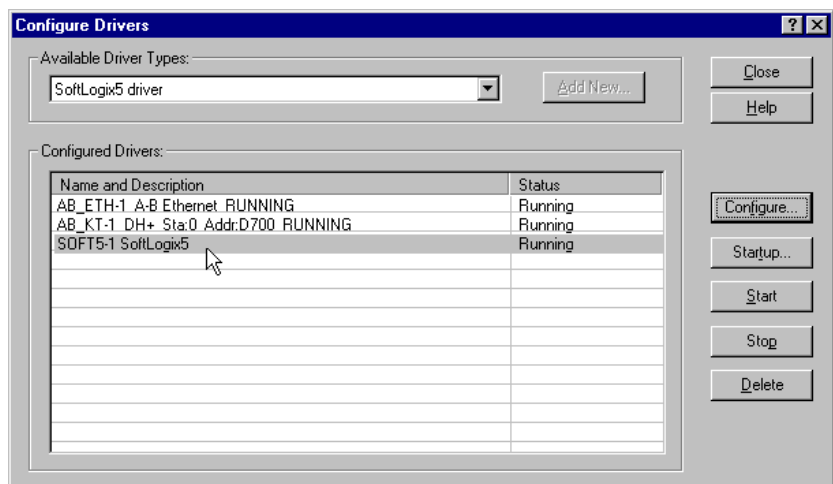
4. Select the default name assigned by the system (e.g., SOFT5-1) and click on **OK**.

The **Configure driver** window will open.



5. Enter the Host Name of your host platform (e.g., US00807385) and click on **OK**.

Your SoftLogix 5 driver will be added to the list of **Configured Drivers** (Your list will show the drivers you have configured on your system).

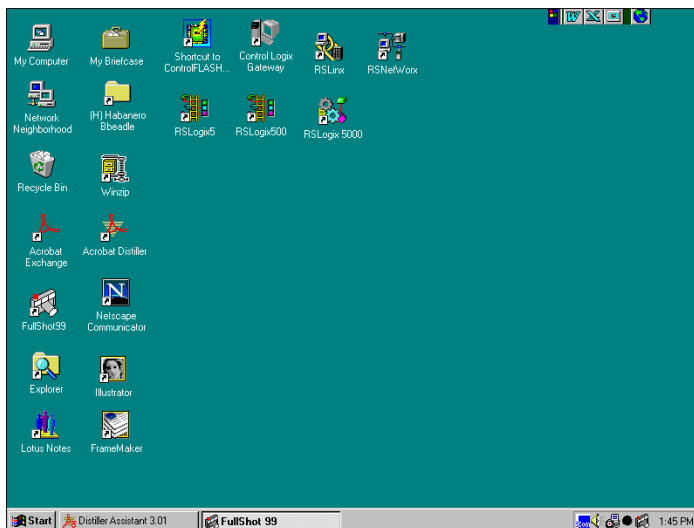


6. Close the **Configure Drivers** window and exit RSLinx.

Configuring the SoftLogix 5 DeviceNet Driver

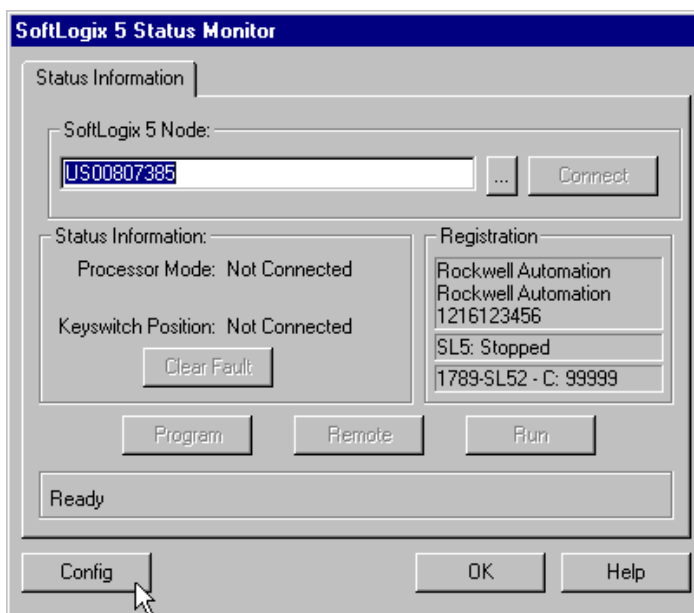
In order for the SoftLogix 5 controller to communicate with the DeviceNet network, you must configure the SoftLogix 5 DeviceNet driver.

To configure the SoftLogix 5 DeviceNet driver, perform the following steps:



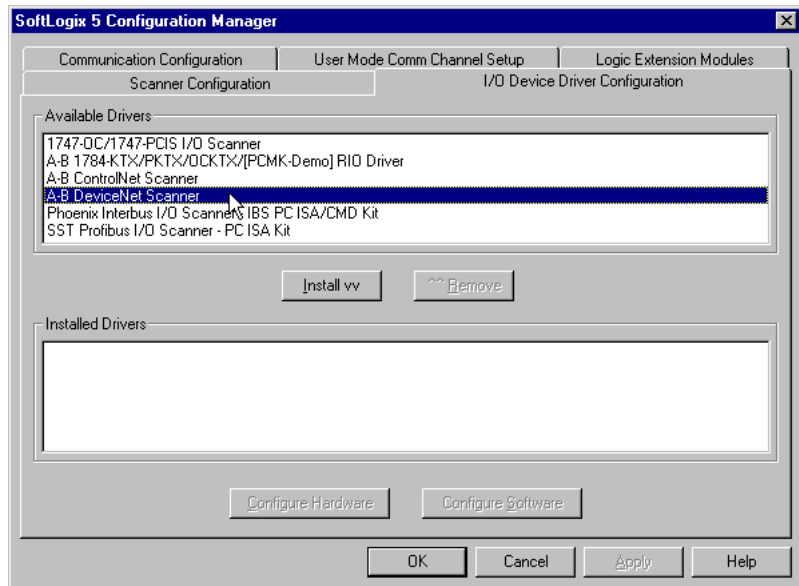
1. Click on the **SoftLogix 5 Status Monitor** in the System tray at the bottom of your screen.

The **SoftLogix 5 Status Monitor** window will open.

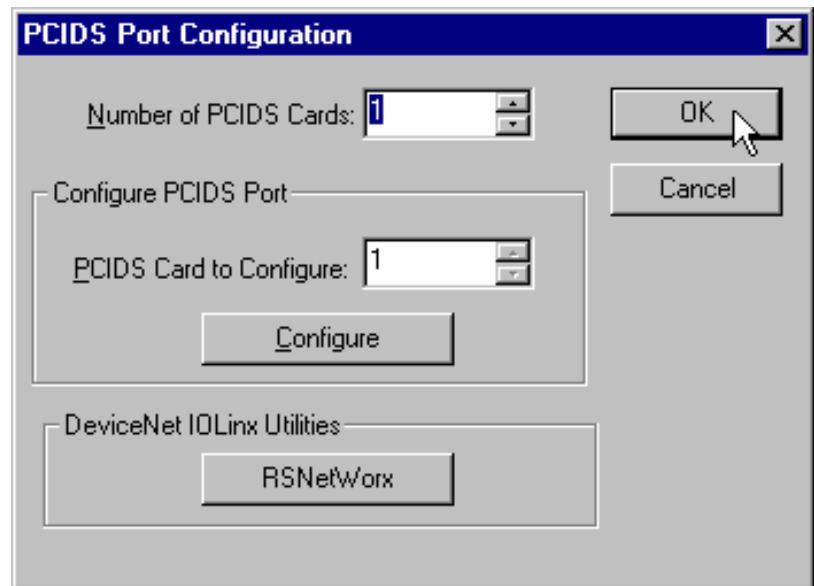


2. Click on the **Config** button.

3. Select the **I/O Device Driver Configuration** tab.

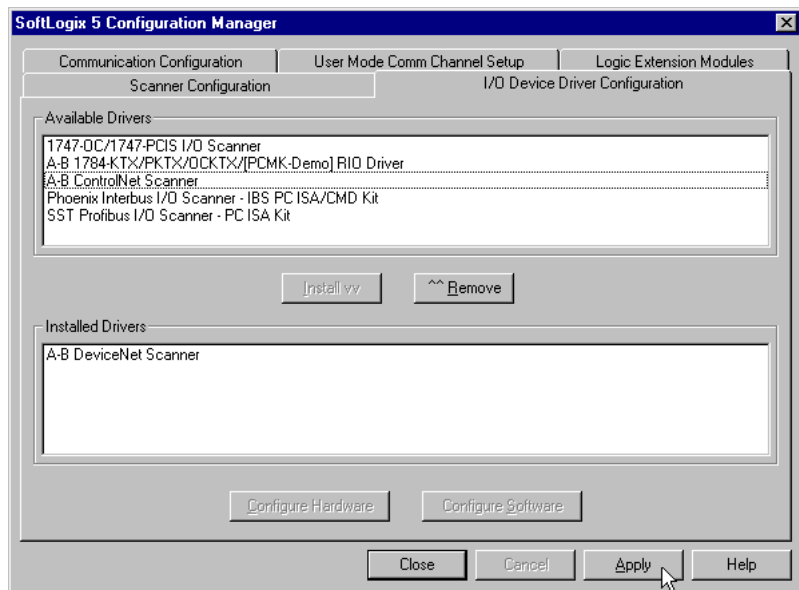


4. Highlight the **A-B DeviceNet Scanner** and click on **Install**.
The PCIDS Port Configuration window will open.



5. Accept the default settings and click on **OK**.

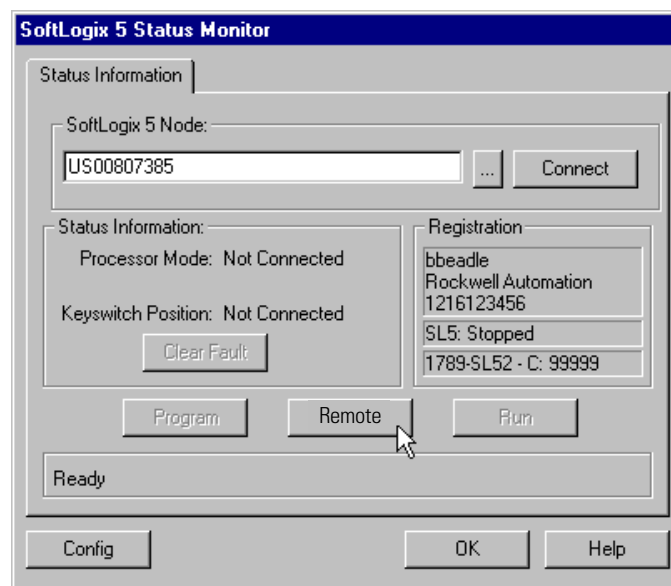
The **A-B DeviceNet Scanner** will be added to the **Installed Drivers**.



- Click on **Apply** and **Close** the window.

Putting the SoftLogix Controller in Remote Mode

In order to download the example application program described in the following section, the SoftLogix Controller should be placed in **Remote** mode.

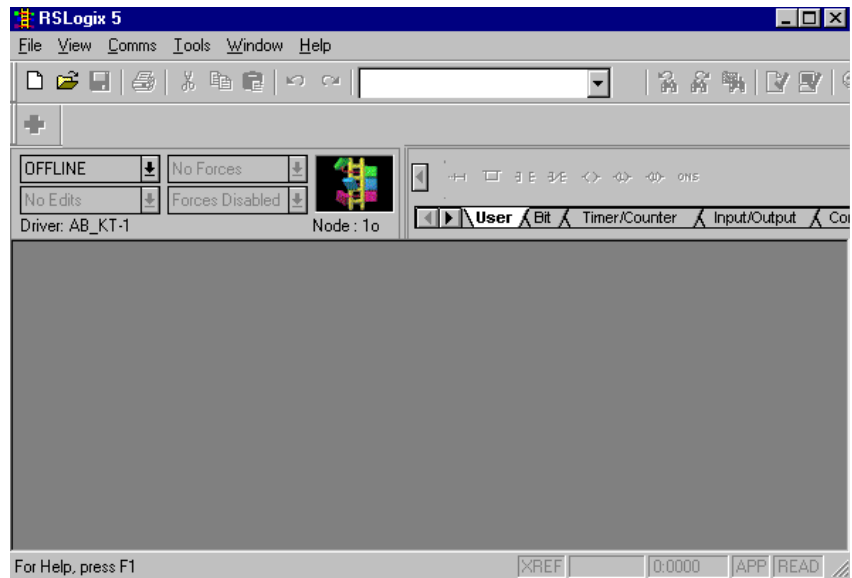


Click on the **Remote** button on the SoftLogix 5 Status Monitor window. Then click on **OK**.

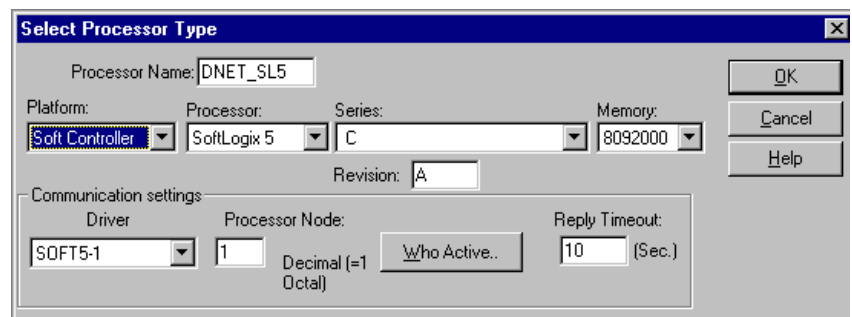
Creating the Example Application Program

Perform the following steps to create the example application program.

1. Start **RSLogix 5** or **RSLogix SL5**. The RSLogix 5 main window will open.



2. From the **File** menu select **New**. The **Select Processor Type** window will open.



3. Enter or select the following information. Then click on **OK**.

In this field	Select or Enter
Processor Name	(enter a name of your choice)
Platform	Soft Controller
Processor	SoftLogix 5 (entered by system)

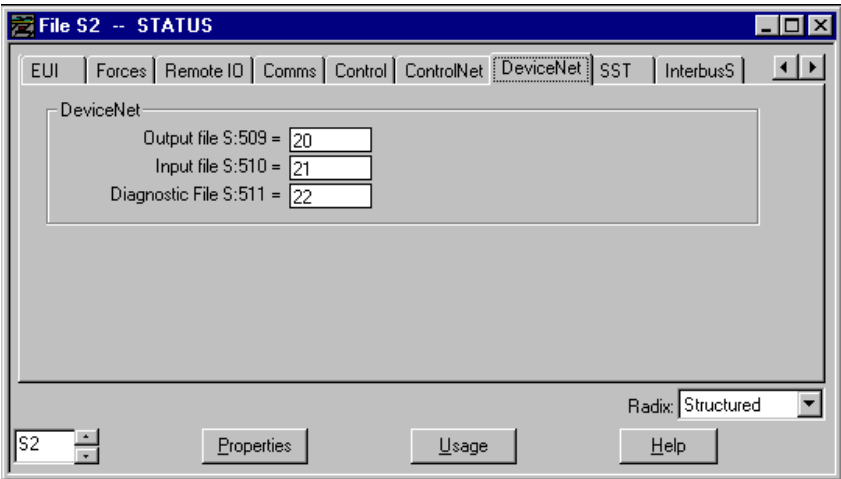
You can accept the defaults for the remaining fields. We used the following settings. (Your settings may be different.)

Series	C
Revision	A
Driver	SOFT5-1
Processor Node	1

On the left side of the RSLogix 5 screen is the Project window:



4. Double-click on **Processor Status** under the Controller folder. The **Status File (File S2)** window will open.



5. Select the **DeviceNet** tab and enter the integer files that will be used for DeviceNet Output, Input, and Diagnostics. We used the following files:

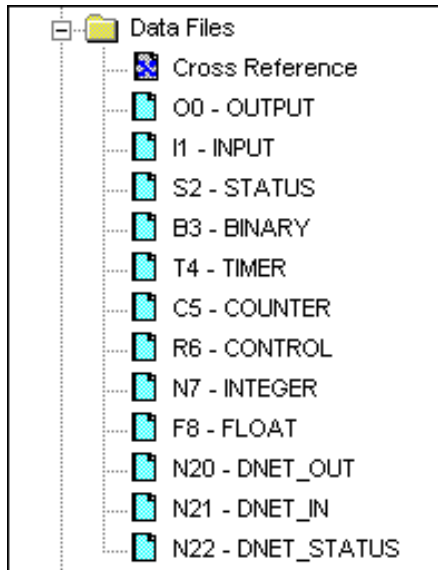
Output File S:509	20
Input File S:510	21
Diagnostic File S:511	22

In this example, Status file word 509 points to integer file 20 (N20) as the DeviceNet output file, Status file word 510 points to integer file 21 (N21) as the DeviceNet input file, and Status file word 511 points to integer file 22 (N22) as the DeviceNet diagnostic file.

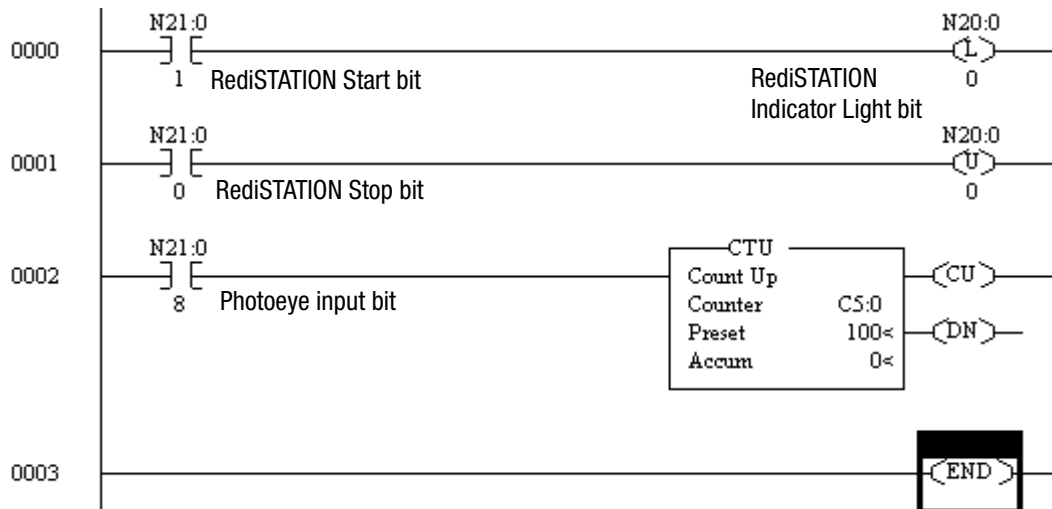
Word 0 of file N20 now corresponds to word 0 of the 1784-PCIDS scanner's output image file. Word 0 of file N21 corresponds to the word 0 of the 1784-PCIDS scanner's input image file, etc.

6. Close the Status file window.

The DeviceNet files will be added to the Data Files folder.



7. Enter the following ladder program:



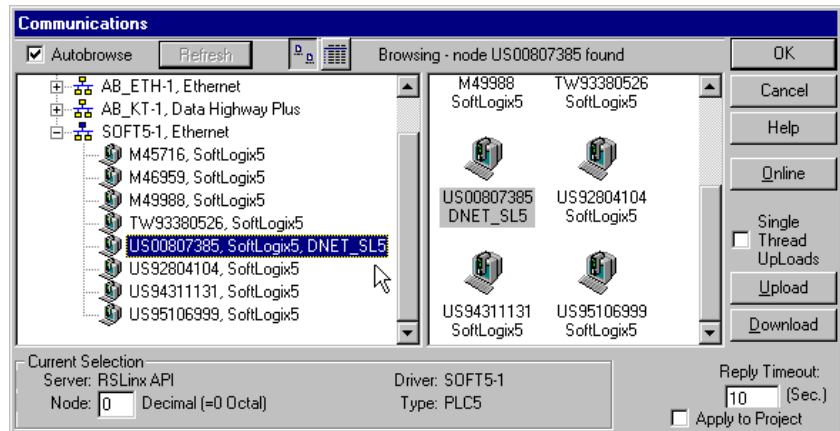
8. Save the program using an appropriate name, e.g., "DNET_SL5".

Downloading the Program

Follow the procedure below to download the example program to your SoftLogix 5 controller.

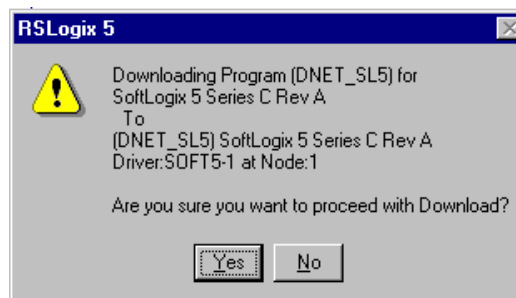
1. Click on the **Comms** menu and select **System Communications**.

The RSLinx **Communications** window will open (your window will appear different from that shown below, depending upon the system you have set up).



2. Select the **SOFT5-1, Ethernet** driver. Expand the tree under driver and highlight your own SoftLogix controller as shown in the figure above.
3. Click on the **Download** button.

You will be prompted to proceed with the Download. You will see a message similar to the one shown below.



4. Click on **Yes** to download the program to the SoftLogix controller.

Running the Example Program

Perform the following steps to run the program and test your network.

1. After the download is complete, go **online** and put the SoftLogix controller into **Run** mode.
2. Press and release the **START** button on the RediSTATION. The red light should turn on. On your screen, you should see rung 0 in your ladder program become energized as you press the button.
3. Pass your hand back and forth over the photoeye several times. On your screen you should see the counter incrementing.
4. Press and release the **STOP** button on the RediSTATION. The red light should turn off. On your screen, you should see rung 2 in your ladder program being energized as you press the button.

This completes the SoftLogix 5 example application.

Configuring the DeviceNet Network from Another Network

What This Appendix Contains

This appendix describes how to access the 1784-PCIDS card from a remote workstation on another network and configure the DeviceNet network. Examples are provided for accessing the 1784-PCIDS card via a ControlLogix Gateway from an Ethernet or Data Highway Plus network, and for accessing the 1784-PCIDS card via an RSLinx Gateway.

You must have previously set up the RSLinx Gateway or ControlLogix Gateway you will use to communicate with the 1784-PCIDS card. For more information on using a ControlLogix Gateway, see the ControlLogix Gateway System User Manual, publication 1756-6.5.13. For information on RSLinx Gateways, refer to the RSLinx software Help screens.

ATTENTION



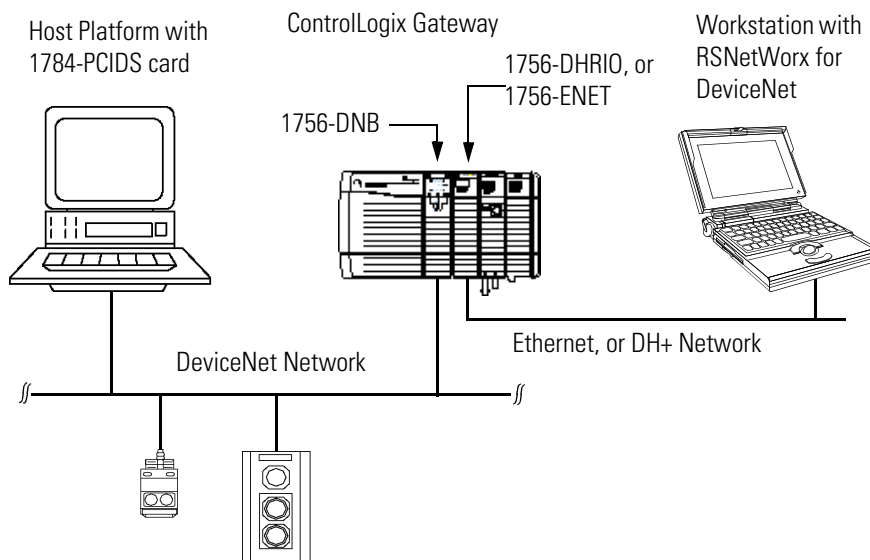
Remote access should be used only for configuration of your network devices. The remote access method is not suitable for real time monitoring of your network devices.

The following table describes what this appendix contains and where to find specific information.

For information about	See page
Configuring the DeviceNet Network Via a ControlLogix Gateway	C-2
Configuring the DeviceNet Network Via an RSLinx Gateway	C-5

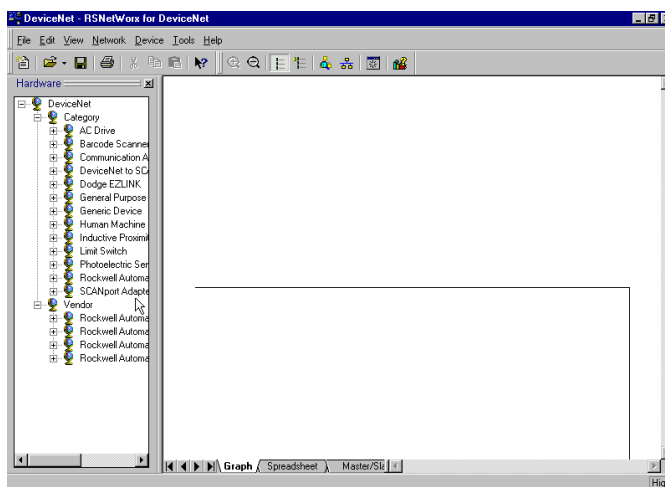
Configuring the DeviceNet Network Via a ControlLogix Gateway

In order to access the 1784-PCIDS card via a ControlLogix Gateway your system must be set up as shown below. The ControlLogix chassis must contain a 1756-DNB module connected to the DeviceNet network, as well as a communications module for the network on which the remote workstation resides (i.e., a 1756-CNB, 1756-DHRIO, or 1756-ENET module).



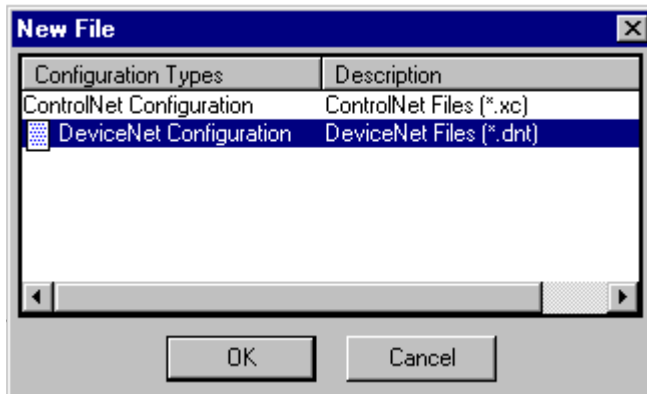
To configure the network via a ControlLogix Gateway perform the steps below:

1. Start **RSNetWorx for DeviceNet** on your remote workstation.



2. From the **File** menu, select **New**.

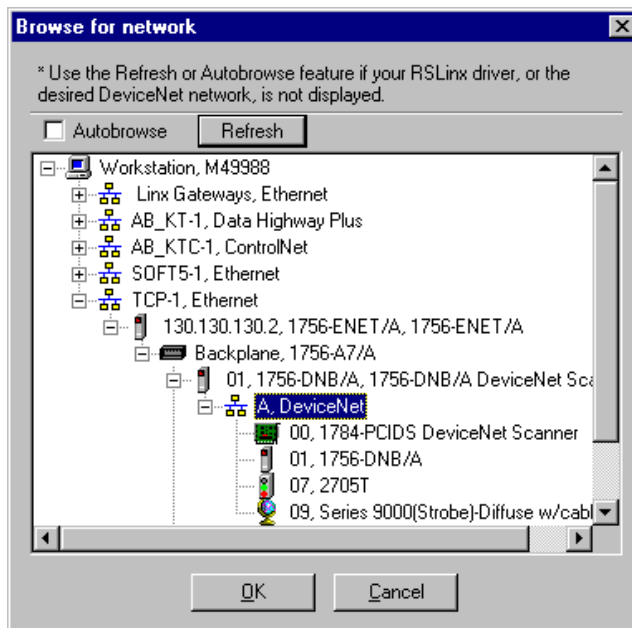
If you have **ControlNet** configured on your remote system, you may see the following window. Otherwise, proceed to step 4.



3. Select **DeviceNet Configuration** and click on **OK**.

4. Click on the **Online** button  on the toolbar.

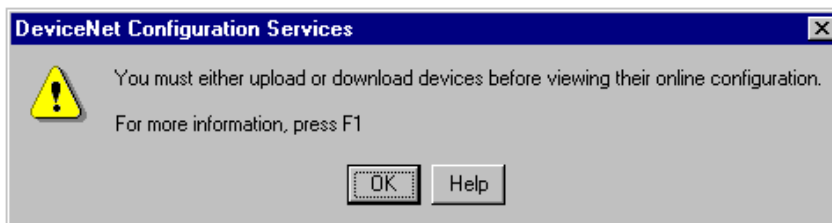
The **Browse for network** window will appear. You will see the drivers you have configured on your system.



5. Select the appropriate driver (e.g. **TCP-1, Ethernet**) and expand the tree through the ControlLogix backplane until you reach the DeviceNet network as shown above.

6. Highlight the DeviceNet icon and click on **OK**.

You will receive the following prompt:



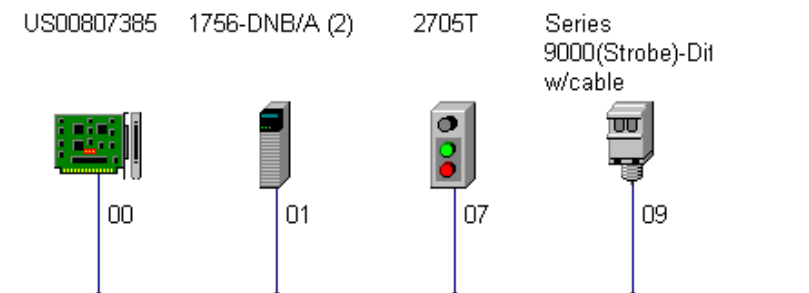
7. Click on **OK** to go online and browse the network.

ATTENTION



Performing a remote browse may take longer than browsing using the 1784-PCIDS driver as described in chapter 4.

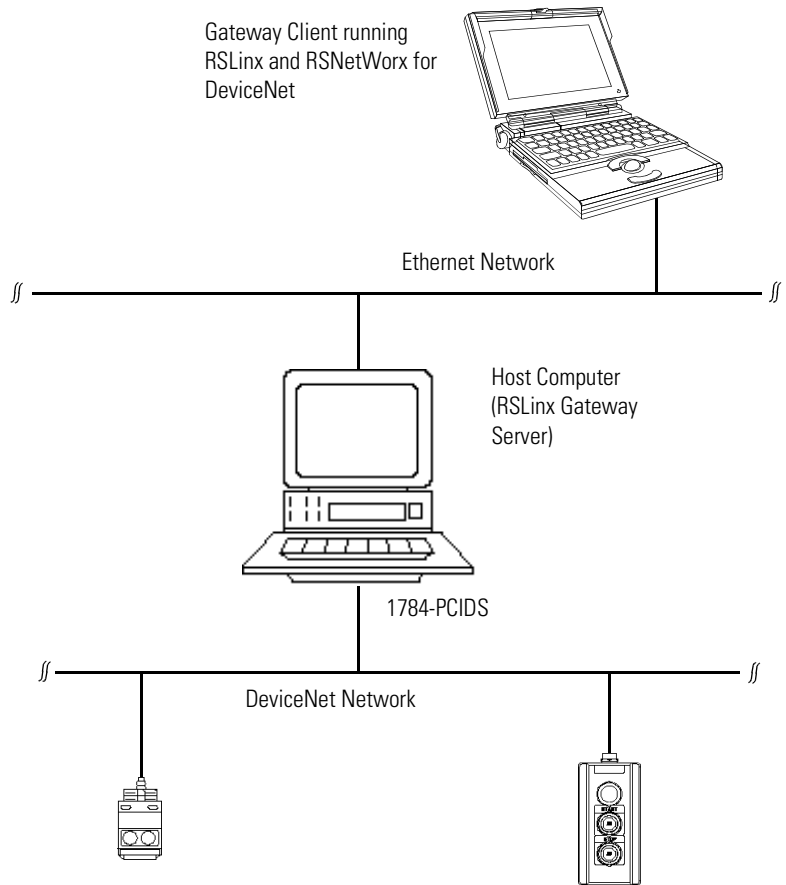
When the software is finished browsing, the DeviceNet network will be displayed on your workstation's screen, similar to the example network shown below.



Once you are online to the DeviceNet network you can perform the procedures described on pages 4-8 to 4-19 of this manual to configure the DeviceNet network.

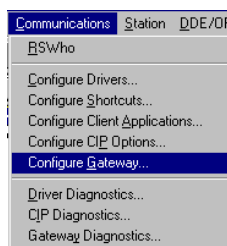
Configuring the DeviceNet Network Via an RSLinx Gateway

With this method the remote workstation and the host computer containing the 1784-PCIDS card are connected to the Ethernet network. The host computer is configured as an RSLinx Gateway and the remote workstation is a gateway client.



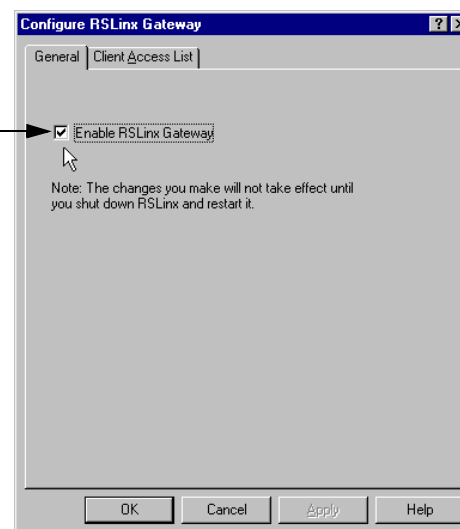
IMPORTANT

You must install the Gateway version of RSLinx **on the host computer** by obtaining a Gateway authorization key from Rockwell Software and checking the Enable RSLinx Gateway box on the Configure RSLinx Gateway screen. See the RSLinx Help screens for more information.



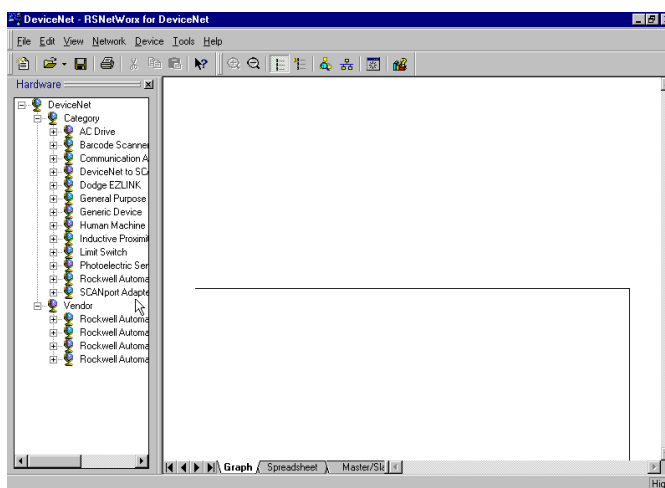
Select Configure Gateway from the RSLinx Communications menu

Check the Enable RSLinx Gateway box.



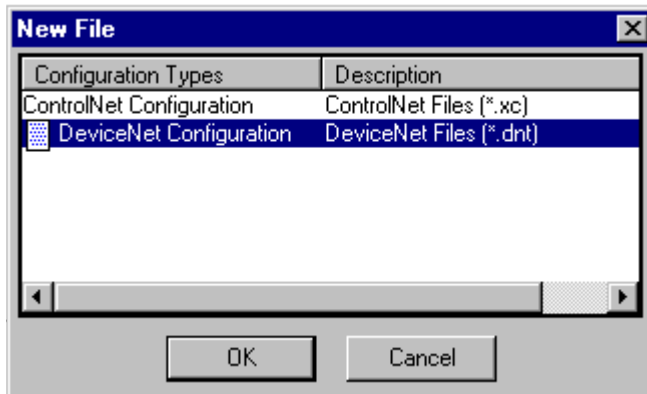
To configure the network via the RSLinx Gateway, perform the following steps:

1. Start **RSNetWorx for DeviceNet** on the remote workstation.



2. From the **File** menu, select **New**.

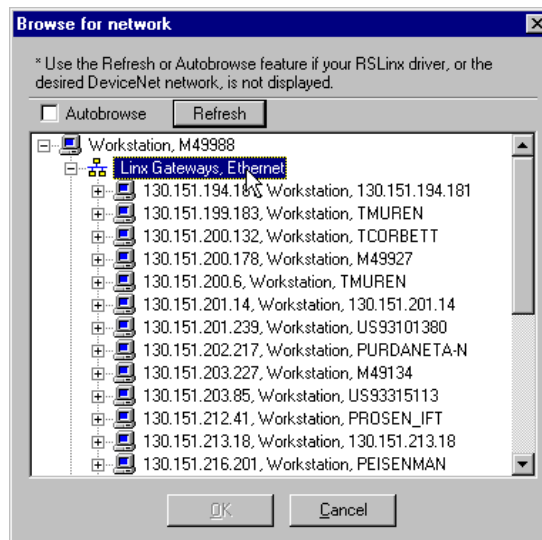
If you have **ControlNet** configured on your system, you may see the following window. Otherwise, proceed to step 4.



3. Select **DeviceNet Configuration** and click on **OK**.

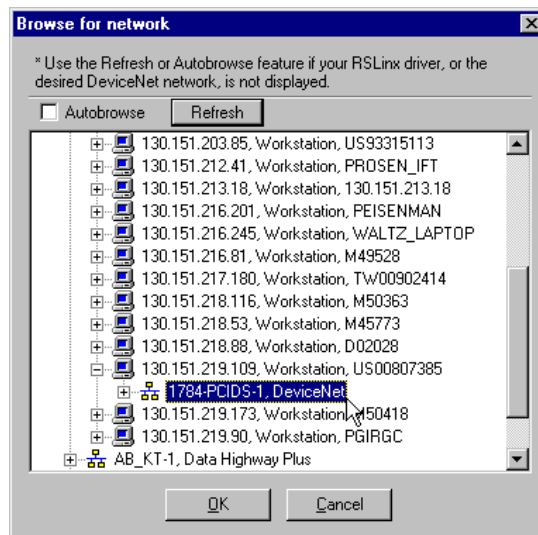
4. Click on the **Online** button  on the toolbar.

The **Browse for network** window will appear. You will see the drivers you have configured on your system.

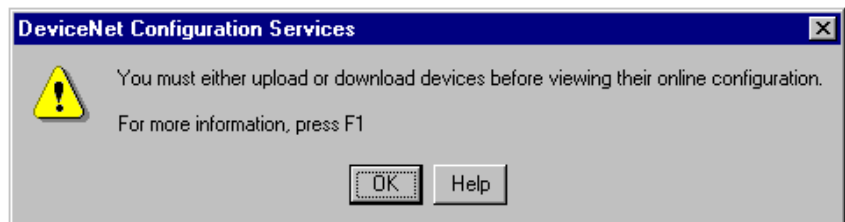


5. Highlight the **RSLink Gateway, Ethernet** driver.

6. Scroll down until you locate your host platform (e.g., US00807385 below).



7. Expand the tree under your host platform until you reach the **1784-PCIDS, DeviceNet** driver as shown above.
8. Highlight the DeviceNet driver and click on **OK**. You will receive the following prompt:



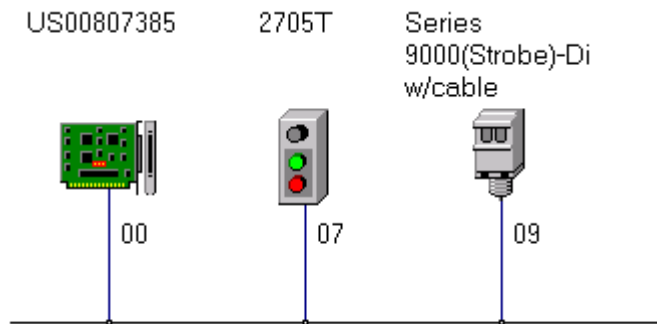
9. Click on **OK** to go online and browse the network.

ATTENTION



Performing a remote browse may take longer than browsing on the host platform as described in chapter 4.

When the software is finished browsing, the DeviceNet network will be displayed on your workstation's screen, similar to the example network shown below.



You are now online to the DeviceNet network via the RSLinx Gateway.

Refer to the procedures described on pages 4-8 to 4-19 of this manual for information on how to configure the DeviceNet network.

Changing the Network Baud Rate

Required Procedure

This Appendix summarizes what you have to do to change the baud rate of an existing DeviceNet network. You must perform the steps below in the following order:

1. Close all applications that might be using the 1784-PCIDS driver. This includes any Soft Control engines as well as explicit messaging applications.
2. Delete the 1784-PCIDS driver from RSLinx.
3. Change the baud rate on any non-autobaud devices on your network by setting the dip switches or individually programming the devices accordingly.
4. Power down your programming terminal/personal computer and your 24V network supply.
5. Turn on your 24V network power.
6. Turn on your personal computer.
7. Re-install the 1784-PCIDS driver in RSLinx, using the new baud rate.

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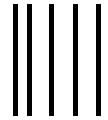
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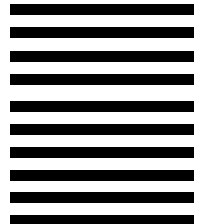
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