AB QUALITY *Allen-Bradley*

Compact™ I/O
1769-SDN
DeviceNet Scanner
Module

1769-SDN

User Manual

Rockwell Automation

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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

WARNING	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

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

ATTENTION	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence

SHOCK HAZARD	Labels may be located on or inside the drive to alert people that dangerous voltage may be present.

BURN HAZARD	Labels may be located on or inside the drive to alert people that surfaces may be dangerous temperatures.

The information below summarizes the changes to this manual since the last printing.

To help you find new and updated information in this release of the manual, we have included change bars as shown to the right of this paragraph.

The table below lists the sections that document new features and additional or updated information about existing features.

For this information	See
Updated related publications listing	P-2
Reference to using the 1769-SDN with CompactLogix controllers	6-1

Notes:

Table of Contents

Read this preface to familiarize yourself with the rest of the manual. It provides information concerning:

- Who should use this manual
- The purpose of this manual
- Related documentation
- Conventions used in this manual
- Rockwell Automation support

Who Should Use this Manual

Use this manual if you are responsible for designing, installing, programming, or troubleshooting control systems that use Allen-Bradley programmable controllers.

You should have a basic understanding of electrical circuitry and familiarity with relay logic. If you do not, obtain the proper training before using this product.

About CompactLogix

This manual focuses on the 1769-SDN module. For detailed information about using the 1769-SDN module with a CompactLogix system, refer to the following publication:

- DeviceNet Modules in a Logix5000 Control Systems User Manual, publication DNET-UM004

    This manual guides the development of a control system that uses a Logix5000 controller and a DeviceNet network. Topics covered include configuring, bridging, connecting, and controlling your DeviceNet network.

Purpose of this Manual

This manual is a reference guide for Compact I/O 1769-SDN DeviceNet scanner module. It describes the procedures you use to install, program, and troubleshoot your module. This manual:

- provides instructions on installing the module
- contains information about using the module on DeviceNet
- provides tips on troubleshooting the module
- contains application examples to show how the module is used with various programmable controllers

Common Techniques Used in this Manual

The following conventions are used throughout this manual:

- Bulleted lists such as this one provide information, not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.
- **CAPITALIZED, BOLD** type is used for emphasis.

Related Documentation

The following documents contain additional information concerning Rockwell Automation products. Contact your local A-B distributor for information on ordering the publications. For electronic copies, go to http://www.ab.com/literature.

For Information On	Read this Document	Publication Number
Configuring the CompactLogix controllers in DeviceNet and bridging information	DeviceNet Modules in Logix5000 Control Systems User Manual	DNET-UM004
Configuring the CompactLogix controllers in ControlNet and bridging information	ControlNet Communication Modules in Logix5000 Control Systems User Manual	CNET-UM001
RSNetWorx for DeviceNet (catalog number 9357-DNETL3)	RSNetWorx for DeviceNet Technical Data	9398-DNETTD
Planning, mounting, wiring, and troubleshooting your CompactLogix system	CompactLogix System User Manual	1769-UM007
Planning, mounting, wiring, and troubleshooting your MicroLogix 1500 system	MicroLogix 1500 Programmable Controllers User Manual	1764-UM001
Installing, configuring, and using Compact I/O analog modules	Compact I/O Analog Modules User Manual	1769-UM002
How to install and use the DeviceNet Interface (catalog number 1761-NET-DNI)	DeviceNet Interface user Manual	1761-6.5
DeviceNet network planning information	DeviceNet Media Design Installation Guide	DN-UM072
IDF1 open protocol	DF1 Protocol and Command Set Reference Manual	1770-6.5.16
Grounding and wiring Allen-Bradley programmable controllers	Allen-Bradley Programmable Controller Grounding and Wiring Guidelines	1770-4.1
Wire sizes and types for grounding electrical equipment	National Electrical Code - Published by the National Fire Protection Association of Boston, MA.	

Overview

This chapter provides an overview of communication between the CompactLogix and MicroLogix 1500 programmable controllers and DeviceNet devices via the 1769-SDN scanner module. The configuration data tables and the RSNetWorx for DeviceNet screens and windows used to configure the data tables are also described.

The following table identifies what this chapter contains and where to find specific information.

For Information About	See Page
What You Need to Know	1-1
Identify Module Features	1-2
What Your Scanner Does	1-3
Communicating with Your Slave Devices	1-4
1769-SDN Module Data Tables	1-5
RSNetWorx Software as a Configuration Tool	1-6

What You Need to Know

Before configuring your scanner, you must understand the:

- Data exchange between the programmable controller and DeviceNet devices through the scanner

- User-configurable scanner data tables

- Role of RSNetWorx software

These topics are covered briefly in this chapter and in more detail throughout the rest of the manual.

Identify Module Features

Use the following figure to identify the features of the scanner.
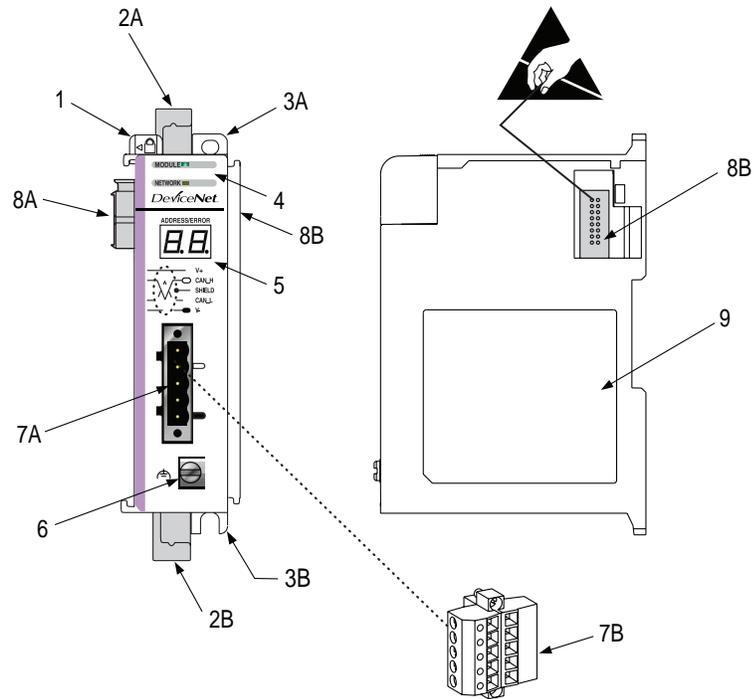
Table 1.1 Features

Item	Description
1	Bus lever (with locking function)
2A	Upper DIN rail latch
2B	Lower DIN rail latch
3A	Upper panel mounting tab
3B	Lower panel mounting tab
4	Module and Network status LEDs
5	Address and Error numeric display
6	Grounding screw
7A	DeviceNet mating male receptacle
7B	Removable DeviceNet female connector
8A	Movable bus connector with female pins
8B	Bus connector with male pins
9	Nameplate label

What Your Scanner Does

In a typical configuration, the scanner acts as an interface between DeviceNet devices and the programmable controller.

DeviceNet Network

CompactLogix controller with 1769 SDN Scanner Module

MicroLogix 1500 Controller with 1769-SDN scanner

PLC with RSNetWorx for DeviceNet Software

1784-PCD Interface Card

1734 POINT I/O

E3 Overload Relay

PowerFlex 40 Driv e Enhanced DeviceNet Communic ations Module

MicroLogix 1000 controller with 1761-NE T-DNI

MicroLogix 1200 controller with 1761-NE T-DNI
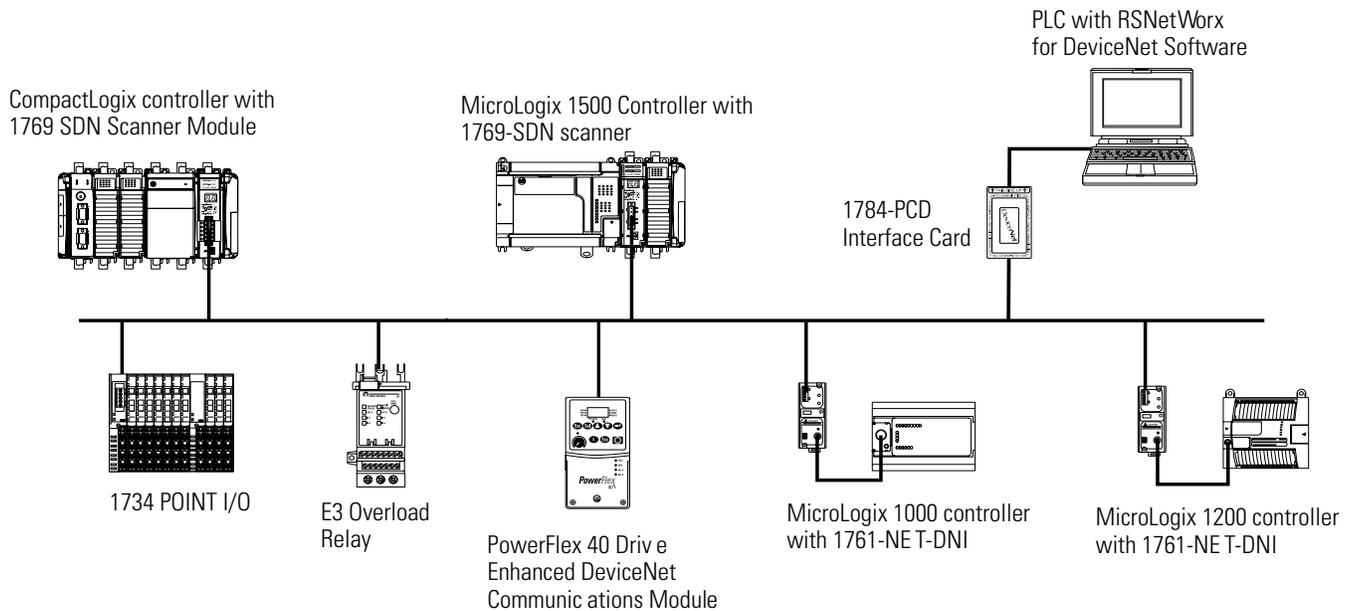
31535M

The scanner communicates with DeviceNet devices over the network to:

- Read inputs from slave devices
- Write outputs to slave devices
- Communicate with peer devices (messaging)
- Upload/download programs to a 1764-LRP based MicroLogix 1500 controller across a DeviceNet network

Communicating with Your Slave Devices

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

- A strobe message is a multicast transfer of data which is 64 bits in length sent by the scanner that initiates a response from each strobed slave device.

  The strobe devices respond with their data, which can be as much as 8 bytes of information. As a slave device, the scanner does not support the strobe message.

- A poll message is a point-to-point transfer of data from 0 to 128 bytes sent by the scanner to the slave device.

  The poll message also initiates a response from each poll slave. The slave device responds with its input data from 0 to 128 bytes.

- A change-of-state message is a transfer of data sent whenever a data change occurs.

  A user-configurable heartbeat rate allows devices to indicate proper operation during intervals between data changes.

- A cyclic message is a transfer of data sent at a specific user-configurable rate, such as every 50 ms.

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

In addition to I/O messaging, the scanner also supports PCCC and CIP explicit messaging, defined later in this manual.

1769-SDN Module Data Tables

To manage the flow of data between your controller and network devices, the scanner uses input and output data images to transfer data, status, and command information between the scanner and the MicroLogix controller. For information about the CompactLogix image structure, refer to the DeviceNet Modules in a Logix5000 Control System User Manual, publication DNET-UM004.

Input Data Image

The input data image is transferred from the scanner module to the controller across the Compact I/O bus.

Table 1.2 Input Data

Word	Description	Data Type
0…65	Status structure	66-word array
66…245	DeviceNet slave inputs	180-word array

Output Data Image

The output data image is transferred from the controller to the scanner module across the Compact I/O bus.

Table 1.3 Output Image

Word	Description	Data Type
0 and 1	Module command array	2-word array
2…181	DeviceNet slave outputs	180-word array

Table 1.4 Module Command Array Bit Assignments

Word	Bit	Operating Mode
0	0	1 = run, 0 = idle
	1	1 = fault
	2	1 = disable network
	3	Reserved[1]
	4	1 = reset
	5…15	Reserved[1]
1	0 …15	Reserved[1]

[1]   **DO NOT** manipulate Reserved Bits. Doing so may interfere with future compatibility.

RSNetWorx Software as a Configuration Tool

RSNetWorx is used to configure the scanner's slave devices. This software tool connects to the scanner over the DeviceNet network via an RS-232 interface (1770-KFD module) or PC Card (1784-PCD or -PCID).

The recommended configuration software is RSNetworx for DeviceNet (version 3.00 or higher).

If your RSNetWorx configuration software does not include the required Electronic Data Sheet (EDS) file, go to http://www.ab.com/networks/eds.

Register the new EDS file using the EDS Wizard in RSNetWorx. Access the wizard from the Tools pull-down menu. This configuration tool allows you to identify all of the DeviceNet devices and their locations in your system.

The controller must be in Program mode, or the scanner in Idle mode (bit 0 of the Module Command Array = 0), for the scanner to accept the configuration information.

Figure 1.1 RSNetWorx Configuration Screen Map

The main **RSNetWorx** screen.
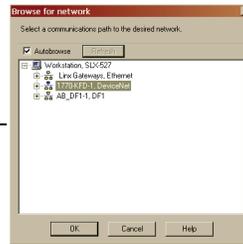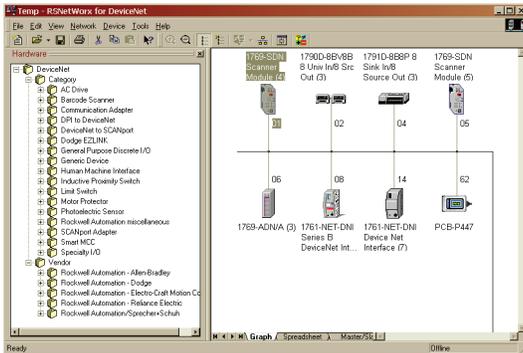
To browse the network, click on the Online button and select the driver.

To access the 1769-SDN scanner module, double-click on the 1769-SDN icon.

To access the scanlist, click on the Scanlist tab.

Move the device into the scanlist.

To download the scanlist, click on the Download to Scanner button.
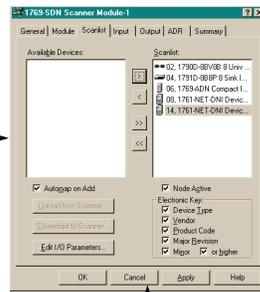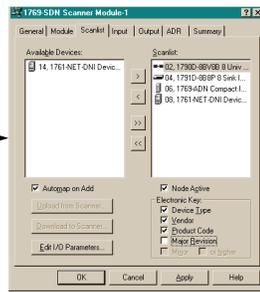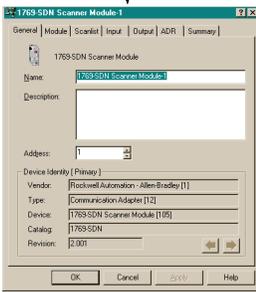
To automatically map input devices, select the Input tab and click on the AutoMap button.

To automatically map output devices, select the Output tab and click on the AutoMap button.

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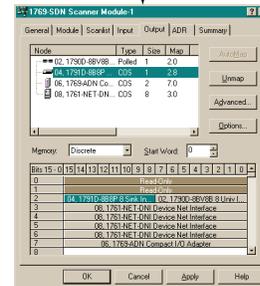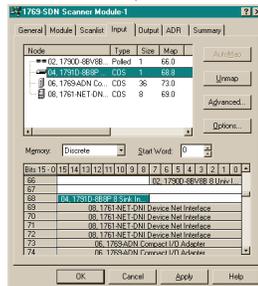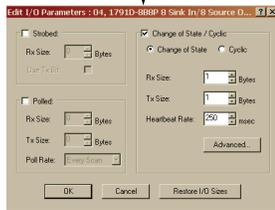
Notes:

Quick Start for Experienced Users

This chapter helps you get started using the 1769-SDN scanner module. Procedures are based on the assumption that you have an understanding of Allen-Bradley controllers. You should understand electronic process control and be able to interpret the ladder logic instructions required to generate the electronic signals that control your application. Because it is a start-up guide for experienced users, this chapter **DOES NOT** contain detailed explanations about the procedures listed.

The following table identifies what this chapter contains and where to find specific information.

For Information About	See Page
Required Tools and Equipment	2-1
What You Need To Do	2-2

Required Tools and Equipment

Have the following tools and equipment ready:

- Personal computer
- Programmable controller: CompactLogix or MicroLogix 1500 system
- 1770-KFD RS-232 DeviceNet adapter, or 1784-PCD or 1784-PCID DeviceNet interface card
- Communications software: RSLinx, version 2.30 or later
- DeviceNet configuration software: RSNetWorx for DeviceNet, version 3.00 or later
- Ladder logic programming software: RSLogix 500, version 5.00.10 or later RSLogix 5000, version 8.02 or later
- 1769-SDN scanner module
- Mounting hardware
- Screwdriver

What You Need To Do

1. Verify planned system configuration.

   a. Ensure system power supply has sufficient current.

   Table 2.1 Maximum Current Draw

Module	5V dc	24V dc
1769-SDN	440 mA	0 mA

   The module cannot be located more than 4 modules away from the system power supply.

   b. Verify that the DeviceNet network has adequate power.

   Table 2.2 DeviceNet Power Requirements

Module	DeviceNet Power Requirements
1769-SDN	N.E.C. Class 2
	90 mA @ 11V dc, max.
	110 mA @ 25V dc, max.
	200 mA for 1.5 ms inrush

2. Remove power.

ATTENTION	Remove power before removing or inserting this module. When you remove or insert a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

   • Sending an erroneous signal to your system's field devices, causing unintended machine motion

   • Causing an explosion in a hazardous environment

   Electrical arcing causes excessive wear to contacts on both the module and its mating connector and may lead to premature failure.

3. Assemble and mount the I/O bank.

   The module can be attached to an adjacent controller, power supply, or I/O module. The module can be panel or DIN-rail mounted. Modules can be assembled before or after mounting.

   Be sure to observe minimum spacing guidelines for adequate ventilation.

4. Ground the module and complete DeviceNet wiring.

5. Apply power to the system.

6. Be sure programming software and equipment is ready.

7. Use RSLinx to configure drivers.

8. Use RSNetWorx to configure the 1769-SDN scanner module and the DeviceNet devices.

9. Use RSLogix to create your project and ladder logic.

10. Start the system.
   a. Apply power.
   b. Download your program and put the controller into Run mode.
   c. During a normal start-up, the Module and Network LEDs turn on solid green.

11. Monitor the module status to check if the module is operating correctly.

Module status is reported by the LEDs and numeric display on the front of the module. The information is also stored in the module's input data file, so these bits can be used in your control program to flag an error.

Notes:

Installation and Wiring

This chapter describes how to install and wire the 1769-SDN scanner module. The following table describes what this chapter contains and where to find specific information.

For Information About	See Page
Compliance to European Union Directives	3-1
Power Requirements	3-2
General Considerations	3-3
System Planning	3-5
System Assembly	3-6
System Mounting	3-7
Replacing the Scanner Module within a System	3-10
Field Wiring Connections	3-11
Scanner Module Power-Up	3-12

Compliance to European Union Directives

This product is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

The module is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2
  EMC – Generic Emission Standard, Part 2 - Industrial Environment

- EN 50082-2
  EMC – Generic Immunity Standard, Part 2 - Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

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 EN61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation, Wiring and Grounding Guidelines for Noise Immunity, publication 1770-4.1
- Automation Systems Catalog, publication B113

Power Requirements

The module receives power through the Compact I/O bus interface from the +5V dc system power supply.

Table 3.1 Maximum Current Drawn by the Module

Module	5V dc	24V dc
1769-SDN	440 mA	0 mA

The module also draws power from the DeviceNet network.

Table 3.2 DeviceNet Power Requirements

Module	DeviceNet Power Requirements
1769-SDN	N.E.C. Class 2
	90 mA @ 11V dc, max.
	110 mA @ 25V dc, max.
	200 mA for 1.5 ms, inrush

General Considerations

Compact I/O is suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2[1]) and to circuits not exceeding Over Voltage Category II[2] (IEC 60664-1).[3]

Hazardous Location Considerations

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only. The following WARNING statement applies to use in hazardous locations.

WARNING ⚠	EXPLOSION HAZARD
	Substitution of components may impair suitability for Class I, Division 2.
	Do not replace components or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
	Do not connect or disconnect components unless power has been switched off or the area is known to be non-hazardous.
	This product must be installed in an enclosure.
	All wiring must comply with N.E.C. article 501-4(b).

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[1]   Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation shall be expected.

[2]   Over Voltage Category II is the load level section of the electrical distribution system. At this level transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.

[3]   Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

Prevent Electrostatic Discharge

ATTENTION	Electrostatic discharge can damage integrated circuits or semiconductors if you touch the bus connector pins. Follow these guidelines when you handle the module:

⚠️

- Touch a grounded object to discharge static potential
- Wear an approved wrist-strap grounding device
- Do not touch the bus connector or connector pins
- Do not touch circuit components inside the module
- If available, use a static-safe work station
- When it is not in use, keep the module in its static-shield box

Remove Power

ATTENTION	Remove power before removing or inserting this module. When you remove or insert a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

⚠️

- Sending an erroneous signal to your system's field devices, causing unintended machine motion
- Causing an explosion in a hazardous environment

Electrical arcing causes excessive wear to contacts on both the module and its mating connector and may lead to premature failure.

Reducing Noise

We recommend installing this module in an industrial enclosure to reduce the effects of electrical interference. Group your modules to minimize adverse effects from radiated electrical noise and heat.

Protecting the Circuit Board from Contamination

The printed circuit boards of the modules must be protected from dirt, oil, moisture, and other airborne contaminants. To protect these boards, we recommend installing the system in an enclosure suitable for the environment. The interior of the enclosure should be kept clean and the enclosure door should be kept closed whenever possible.

System Planning

Consider the following when planning your system:

- The scanner can communicate with up to 63 DeviceNet devices
- The scanner, as a master, can own up to 63 slave I/O nodes
- The scanner can simultaneously be a master and be a slave owned by another DeviceNet master
- A 1769-ECR (right end cap) or 1769-ECL (left end cap) is required to terminate the end of the Compact I/O bus
- Each bank of Compact I/O must have its own power supply

  A MicroLogix 1500 acts as the power supply for modules directly connected to it.

- A Compact I/O power supply, or MicroLogix 1500 base unit, has limits on the amount of +5V dc and +24V dc current it can supply to modules in its I/O bank

  These limits depend on the catalog number, e.g., 1769-PA2, of the supply. A bank of modules must not exceed the current limits of the I/O bank power supply or MicroLogix 1500 Base Unit.

  Refer to the Compact 1769 Expansion I/O Power Supplies Installation Instructions, publication 1769-IN028, or the MicroLogix 1500 User Manual, publication 1764-UM001.

- The scanner has a distance rating of four, therefore the scanner must be within four modules of the I/O bank's power supply
- Determine the DeviceNet baud rate based on standard DeviceNet considerations
- Consider the number of words of I/O data the host controller supports

For more information on planning your DeviceNet network, refer to the DeviceNet Media Design Installation Guide, publication DN-UM072.

System Assembly

The module can be attached to an adjacent controller, power supply, or I/O module. The following procedure shows you how to assemble the Compact I/O system.
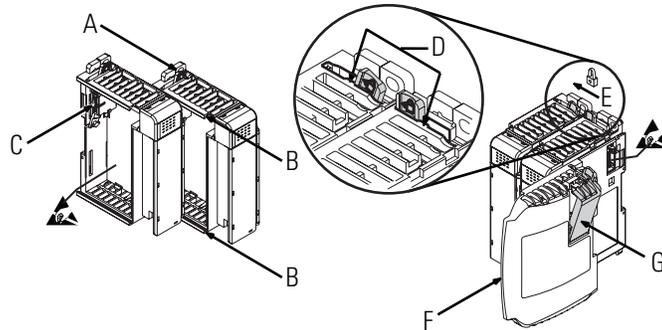
1. Disconnect power.

2. Check that the bus lever of the module (A) is in the unlocked (fully right) position.

3. Use the upper and lower tongue-and-groove slots (B) to secure the modules together.

4. Move the module back along the tongue-and-groove slots until the bus connectors (C) line up with each other.

5. Use your fingers or a small screw driver to push the bus lever back slightly to clear the positioning tab (D).

6. Move the module's bus lever fully to the left (E) until it clicks. Ensure it is locked firmly in place.

> **ATTENTION** ⚠
>
> When attaching I/O modules, it is very important that the bus connectors are securely locked together to ensure proper electrical connection.

7. Attach an end cap terminator (F) to the last module in the system by using the tongue-and-groove slots as before.

8. Lock the end cap bus terminator (G).

> **IMPORTANT**
>
> A 1769-ECR or 1769-ECL right or left end cap must be used to terminate the end of the serial communication bus.

System Mounting

ATTENTION	During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands, etc.) is kept from falling into the module. Debris that falls into the module could cause damage at power up.

Minimum Spacing

Maintain spacing from enclosure walls, wireways, adjacent equipment, etc. Allow 50 mm (2 in.) of space on all sides for adequate ventilation, as shown below:

```
                                    Top

     Side    Host Controller    Compact I/O  Compact I/O  Compact I/O  Compact I/O  Compact I/O  End Cap   Side

                                   Bottom
```
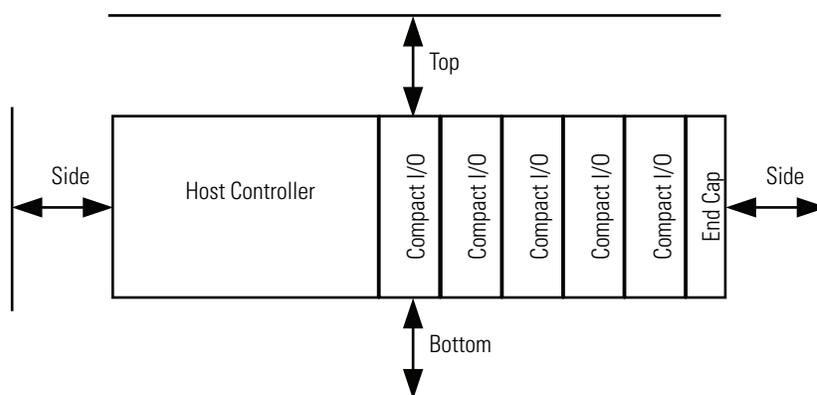
Allow at least 110 mm (4.33 in.) of enclosure depth to accommodate the module and the DeviceNet connector.

Panel Mounting

Mount the module to a panel using two screws per module. Use M4 or #8 panhead screws. Mounting screws are required on every module.

Panel Mounting Using the Dimensional Drawing

All dimensions are in millimeters (inches). Hole spacing tolerance: ±0.4 mm (0.016 in.).

Compact I/O with L35E CompactLogix Controller and Power Supply

Compact I/O with MicroLogix 1500 Base Unit and Processor

Panel Mounting Procedure Using Modules as a Template

The following procedure allows you to use the assembled modules as a template for drilling holes in the panel. Due to module mounting hole tolerance, it is important to follow these procedures:

1. On a clean work surface, assemble no more than three modules.

2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.

3. Return the assembled modules to the clean work surface, including any previously mounted modules.

4. Drill and tap the mounting holes for the recommended M4 or #8 screw.

5. Place the modules back on the panel, and check for proper hole alignment.

6. Attach the modules to the panel using the mounting screws.

   If mounting more modules, mount only the last one of this group and put the others aside. This reduces remounting time during drilling and tapping of the next group.

7. Repeat steps 1 to 6 for any remaining modules.

DIN Rail Mounting

The module can be mounted using the following DIN rails:
35 x 7.5 mm (EN 50022 - 35 x 7.5) or 35 x 15 mm (EN 50022 - 35 x 15).

Before mounting the module on a DIN rail, close the DIN rail latches. Press the DIN rail mounting area of the module against the DIN rail. The latches will momentarily open and lock into place. DIN rail mounting dimensions are shown below.
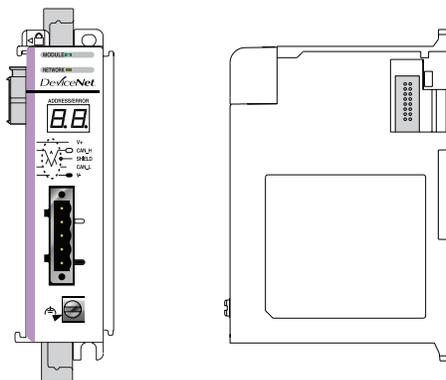
Table 3.3

Dimension	Height
A	118 mm (4.65 in)
B	59 mm (2.325 in)

Replacing the Scanner Module within a System

The scanner can be replaced while the system is mounted to a panel (or DIN rail) once power is removed.

1. Remove power.

2. Remove the DeviceNet cable from the scanner by removing the DeviceNet connector.

3. Remove the upper and lower mounting screws from the scanner (or open the DIN latches using a flat-blade screwdriver).

4. On the scanner to be replaced and the right-side adjacent module (or end cap if the scanner is the last module in the bank), move the bus levers to the right (unlock) to disconnect the scanner from the adjacent modules.

5. Gently slide the disconnected scanner module forward.

6. If you feel excessive resistance, make sure that you disconnected the scanner from the bus and that you removed both mounting screws (or opened the DIN latches).

   It may be necessary to rock the scanner slightly from front to back to remove it, or, in a panel-mounted system, to loosen the screws of adjacent modules.

7. Before installing the replacement scanner, be sure that the bus lever on the right-side adjacent module is in the unlocked (fully right) position.

8. Slide the replacement scanner into the open slot.

9. Connect the scanner and modules together by locking (fully left) the bus levers on the replacement scanner and the right-side adjacent module or end cap.

10. Replace the mounting screws (or snap the scanner onto the DIN rail).

11. Replace the DeviceNet cable on the scanner by attaching the connector to the scanner.

12. Restore scanner configuration using RSNetWorx for DeviceNet.

> **IMPORTANT**   Be sure that the new module has the same node address and baud rate as the module that was replaced.

Field Wiring Connections

Ground the Scanner Module

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the scanner's mounting tabs or DIN rail (if used), are not required unless the mounting surface cannot be grounded.

ATTENTION ⚠	The grounding screw on the front of the scanner must be connected to a suitable ground source when operating in electrically noisy environments. Use a #14 AWG wire to make this connection.

Refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional information.

DeviceNet Wiring

g

DeviceNet Connector

Grounding Screw

Use #14 AWG wire to connect to panel ground.
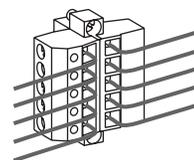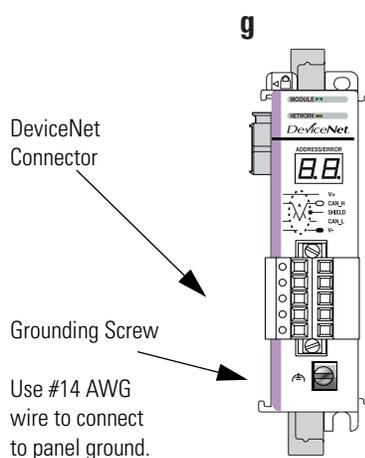
Table 3.4

Connect[1]	To
Red Wire	V+
White Wire	CAN High
Bare Wire	Shield
Blue Wire	CAN Low
Black Wire	V-

1. Connect the DeviceNet cable to the removable connector as shown.

2. Insert the removable female connector into the mating male connector on the DeviceNet scanner module.

3. Screw the removable connector to the scanner case with the upper and lower mounting screws. Screw torque is 0.6 to 0.7 Nm (5 to 6 in-lbs).

IMPORTANT	If the 1769-SDN is the first or last device connected to the DeviceNet network trunkline, be sure to add a termination resistor (120 Ω 1% ≥ ¼W resistor, Allen-Bradley part number 1485A-C2) across the Blue (CAN Low) and White (CAN High) wires.

Scanner Module Power-Up

When power is applied via the Compact I/O bus, the scanner module goes through a self test sequence. Upon successful completion of the self test, the scanner is ready to communicate.

The default scanner settings are:

- Baud rate = 125K
- Node address = 63

Use your configuration software to change the baud rate and node address.

Configure the DeviceNet Network

This chapter describes how to configure the DeviceNet network using RSLinx and RSNetWorx for DeviceNet software. The following table describes what this chapter contains and where to find specific information.

For Information About	See Page
Software Versions	4-1
Install the Software	4-2
Use RSLinx to Configure Your DeviceNet Driver	4-2
Use RSNetWorx to Configure the 1769-SDN's Scanlist	4-4

Software Versions

The following table lists the software and revision level required to operate with the 1769-SDN scanner module.

Table 4.1 Compatible Software

Function	Program	Revision
Communications	RSLinx	2.30 or later
DeviceNet Configuration	RSNetWorx for DeviceNet	3.00 or later
Ladder Logic Programming Software	RSLogix 500	5.00.10 or later
	RSLogix 5000	8.02 or later

You will also need one of the following interfaces to use your computer to communicate with the DeviceNet network:

- 1770-KFD RS-232 DeviceNet adapter
- 1784-PCD or 1784-PCID DeviceNet interface card

If your RSNetWorx configuration software does not include the required Electronic Data Sheet (EDS) file, go to http://www.ab.com/networks/eds.

Register the new EDS file using the EDS Wizard in RSNetWorx. Access the wizard from the Tools pull-down menu.

Install the Software

Install RSLinx and RSNetWorx.

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

   The CD-ROM supports Windows Autorun. If you have Autorun configured, the installation will automatically start when you insert the CD-ROM in your drive. If you do not have Autorun configured, perform steps 2 and 3.

2. From the Windows Start menu, select Run.

3. Browse for the Setup program on the CD-ROM and open it.

4. Follow the prompts that appear on the screen as you install the software.

After software installation is complete, you will use RSLinx to configure your DeviceNet driver and RSNetWorx to configure the network.

Use RSLinx to Configure Your DeviceNet Driver

1. Start RSLinx.
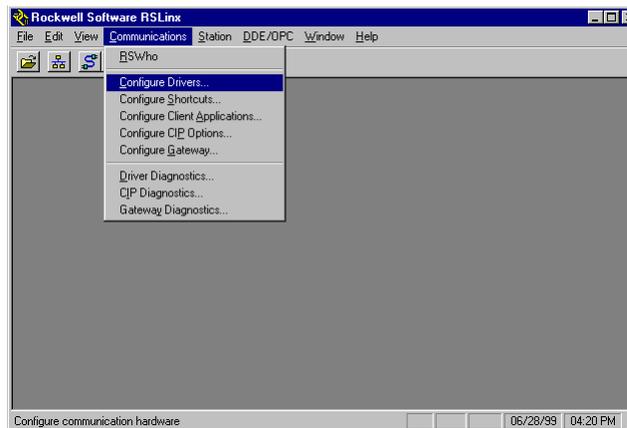
2. From the Communications menu, select Configure Drivers as shown above.
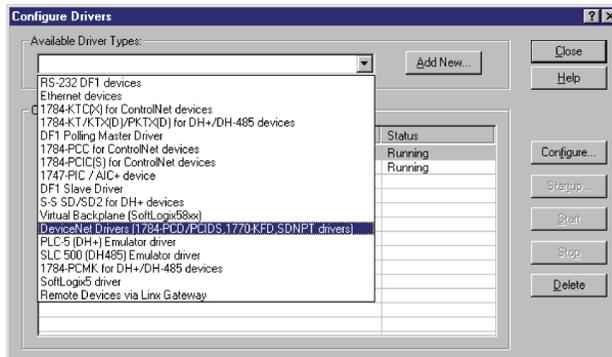
3. Select DeviceNet Drivers from the above pull-down list and click on Add/New.
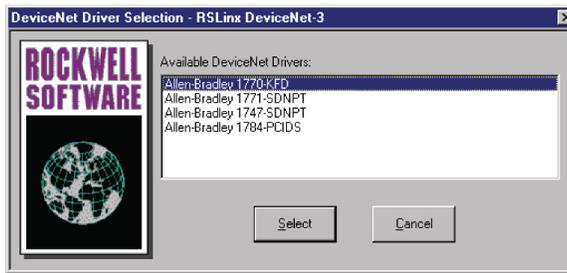
4. Select your driver.
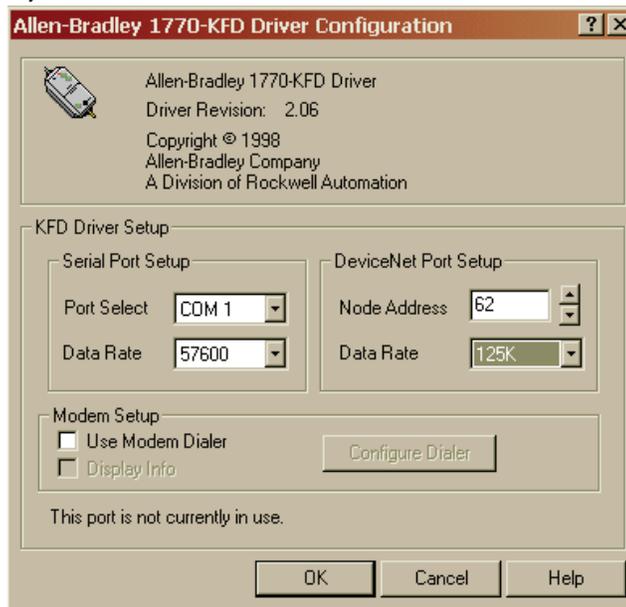
Your driver setup will depend on your particular system setup (COM port, baud rate, node address). Choose the appropriate settings for your system.

5. Configure the driver using the example above as a guide and click on OK. The software will take a few seconds to configure the driver.
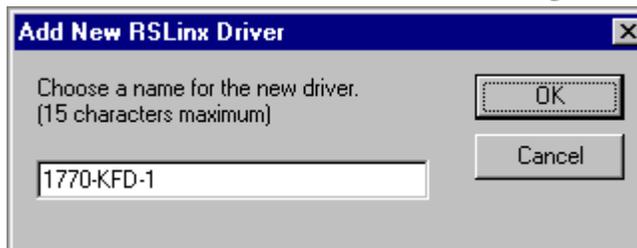
6. Click on OK to use the default driver name.

7. Minimize RSLinx.

You will use the driver you just configured to browse and configure the network with RSNetWorx.

Use RSNetWorx to Configure the 1769-SDN's Scanlist

This manual assumes a certain level of familiarity with RSNetWorx. For detailed information on RSNetWorx for DeviceNet, please refer to your software's documentation.

Set Up an Online Connection

Follow the procedure below to set up an online connection to the DeviceNet network using the 1770-KFD driver.

1. Start RSNetWorx.
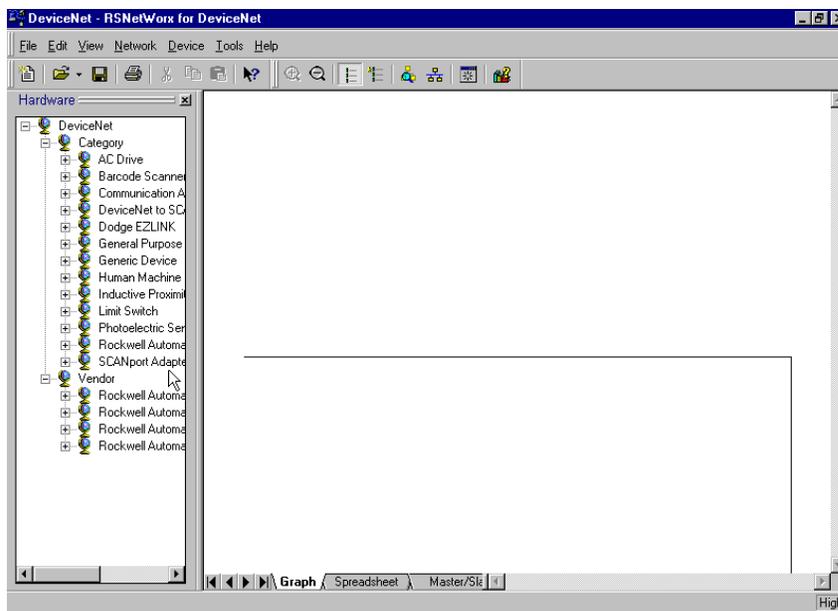
2. From the File menu, select New.

If you have ControlNet configured on your system you may see the following window. Otherwise, proceed to step 4.
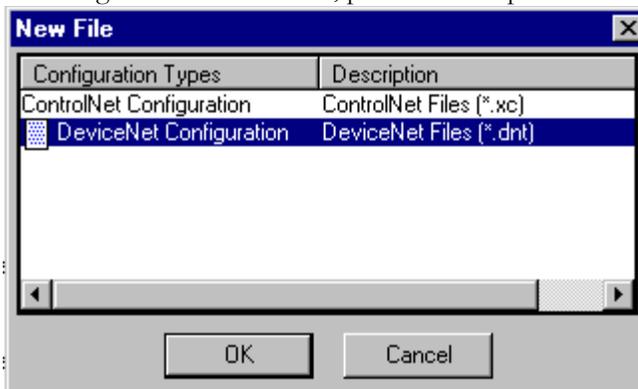
3. Highlight DeviceNet Configuration and click on OK.

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

A list of the available networks will appear. Your list may appear different from that shown below, depending upon the drivers you have configured on your system.
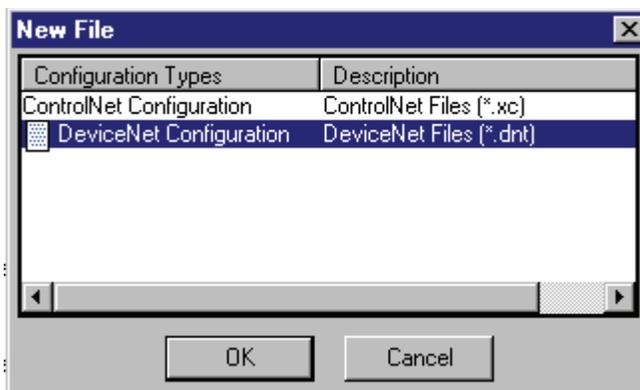
5. Select your DeviceNet driver and click on OK.

You will be prompted to upload or download devices before going online.

6. Click on OK to upload the devices and go online.

RSNetWorx will begin browsing for network devices. When the software is done browsing, your network is displayed on your screen.
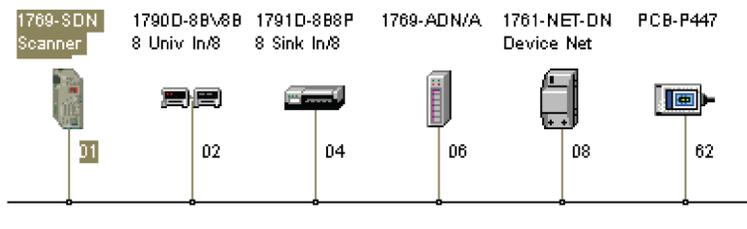
RSNetWorx performs a single pass browse when you go online or choose the browse feature. The software will poll for devices one time and display the results. If a node which was online later goes offline, there will be no live indication in RSNetWorx. You must manually perform a browse to detect the missing node.

To manually perform the browse, press the [icon] button.

If RSNetWorx fails to find a device, check the physical connection to the device. If the physical connection is intact, verify that the device's baud rate is the same as the DeviceNet driver's.

If your RSNetWorx configuration software does not include the required Electronic Data Sheet (EDS) file, go to http://www.ab.com/networks/eds.

Register the new EDS file using the EDS Wizard in RSNetWorx. Access the wizard from the Tools pull-down menu.

Set the 1769-SDN Node Address

Once the network browse is complete, the node addresses appear to the right of their icons.

Use this procedure to change the node address of devices on the network (e.g., a photoeye). You can also change the network data rate (baud rate) of some devices. Depending upon the device, you may need to cycle power for baud rate changes to take effect.

The controller must be in the Program mode, or the scanner in the Idle mode (bit 0 of the Module Command Array = 0), for the scanner to accept the configuration information.

1. From the Tools menu, select Node Commissioning.
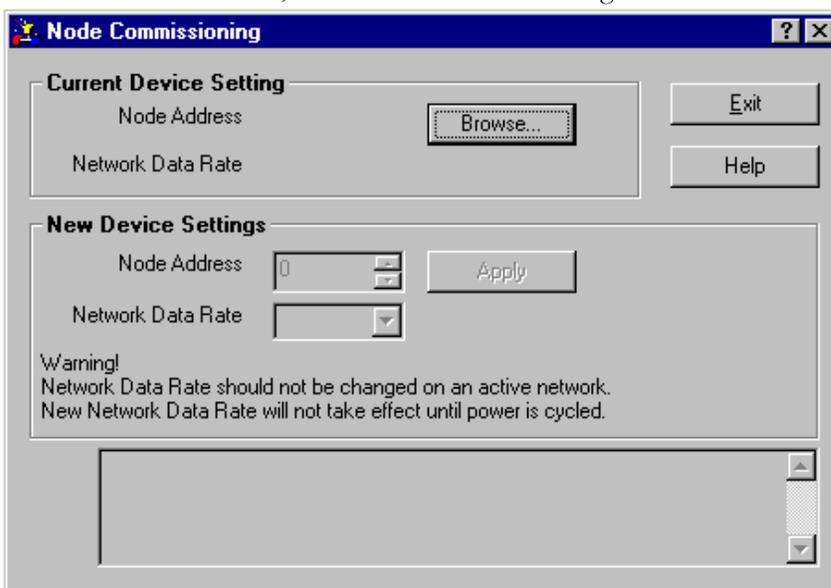
2. Click on the Browse button.
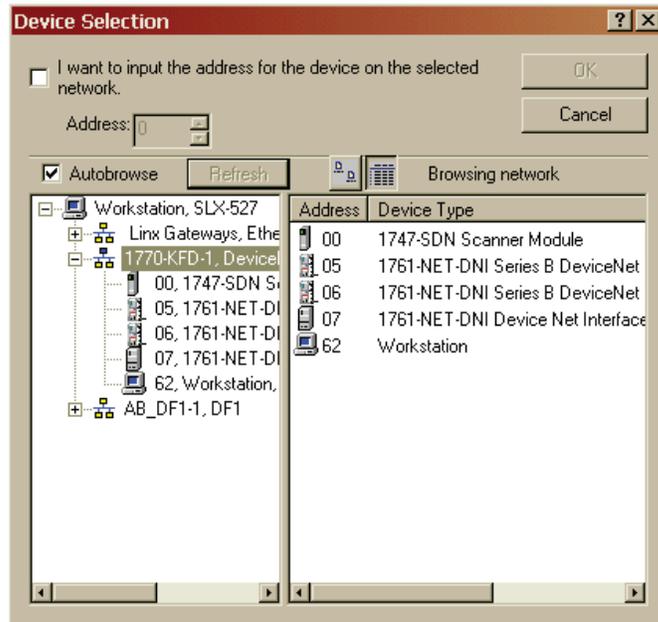
3. Select the DeviceNet network.

The devices on the network will appear in the right panel of the window.

4. Select the device you are commissioning in the right panel and click on OK.

You will see the Node Commissioning window with the current settings for your scanner. Your window will look similar to the next one shown in this procedure.

The default scanner settings are:

- Baud rate = 125K
- Node address = 63
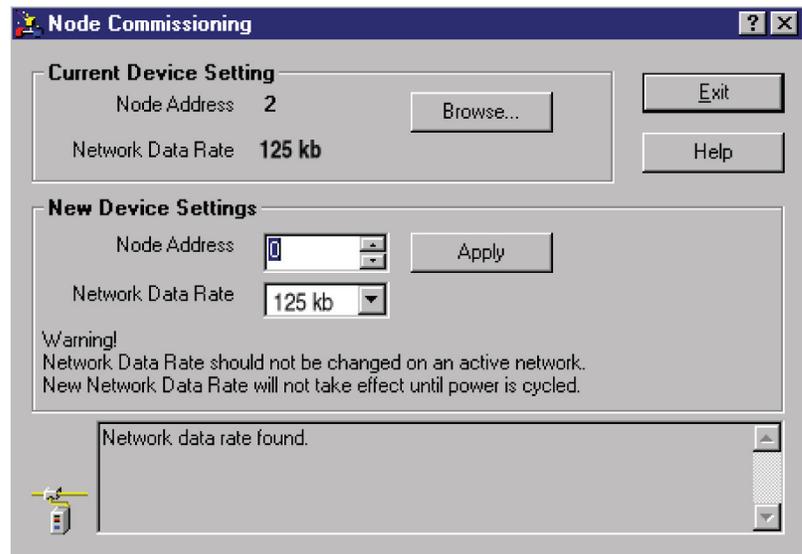
5. In the New Device Settings: Node Address box, enter the new node address.

6. Click on Apply and Exit the window.

Configure the I/O Devices

The information in this section will focus on the scanner's configuration and parameters that you can change using RSNetWorx.

The following screen shows how a DeviceNet network is shown within RSNetWorx. As you can see, node one is a 1769-SDN scanner. To view or modify the scanner's parameters, double-click on the scanner.
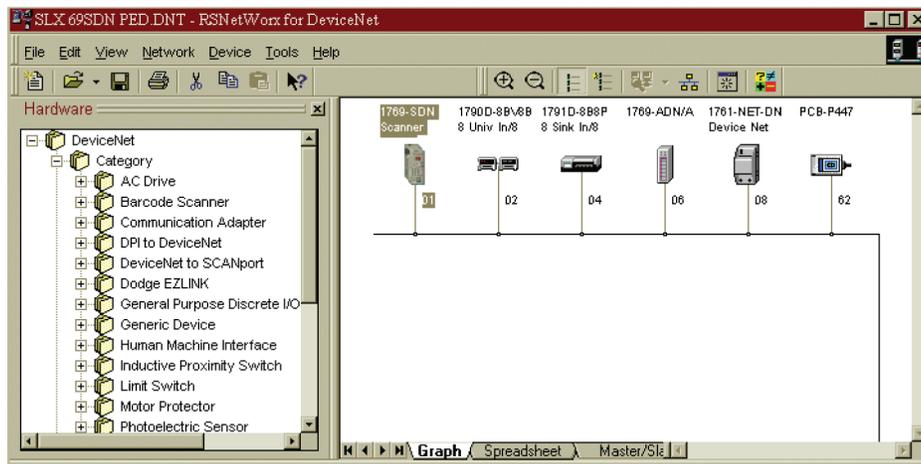
General Tab

The following screen shows the properties dialog that RSNetWorx displays for the 1769-SDN scanner module.
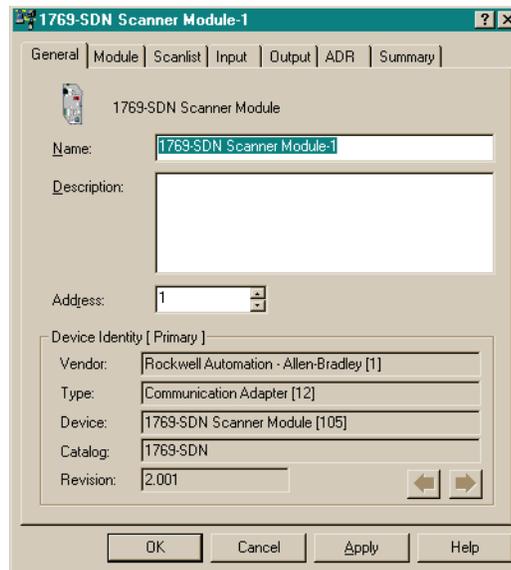
Available items are accessed through a series of tabs located across the top of the screen. The General tab is the default tab and provides information relative to the module.

If you ever need product support, you will need to provide the revision number when you contact Rockwell Automation Technical Support.

Module Tab
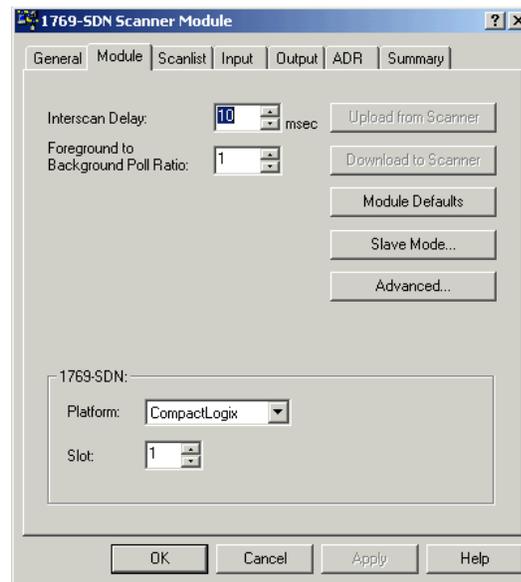
Interscan Delay

This parameter defines the delay time the scanner uses between scans of the DeviceNet network. If you have slave devices configured for Polled behavior in the 1769-SDN's scanlist, Interscan Delay (ISD) defines the amount of time the scanner waits between DeviceNet I/O updates.

Increasing the ISD time causes a longer network scan, which adversely affects overall input-to-output performance. However, the increase allows lower priority messages to get more network access. These lower priority messages include those used to do network browsing and configuration upload/download functions. So, if these network functions are sluggish on your system, increase the ISD time.

Foreground to Background Poll Ratio

Devices set for polled behavior can be polled on every I/O scan (foreground) or they can be polled less frequently (background). Setting a device for foreground or background behavior is done when you configure each device in the scanner's input section.

Figure 4.1 Foreground/Background Polling Behavior

Each waveform shows polling frequency for the given Foreground to Background Poll Ratio

Where:

F_X = x foreground slave devices

B_1 = 1st background slave device

B_2 = 2nd background slave device

B_3 = 3rd background slave device

B_4 = 4th background slave device
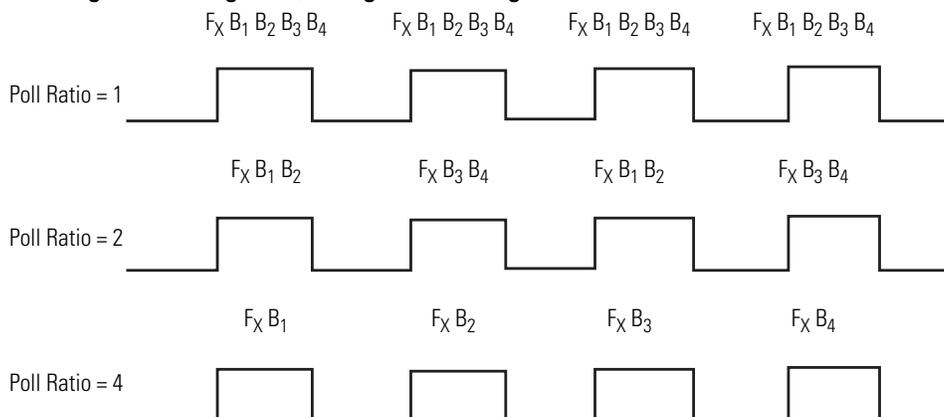
Module Defaults

Clicking the Module Defaults button sets Interscan Delay and Foreground to Background Poll Ratio to the following values:

- Interscan Delay: 10 ms
- Foreground to Background Poll Ratio: 1

Slave Mode

Enable slave mode only if you want to use this scanner as a slave. Clicking on the Slave Mode button opens the following screen:
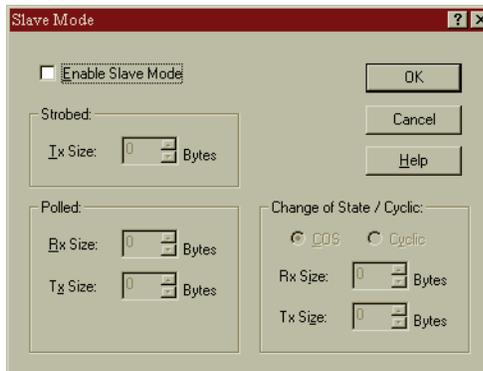
This parameter enables the slave functionality of the scanner, and allows you to set the I/O behavior, with the amount of data to be exchanged. The slave mode settings are described in the following table:

Table 4.2 Slave Mode Settings

Connection Format	Description
Strobed	Not supported by the 1769-SDN scanner module.
Polled	Values entered into Rx and Tx parameters define how much data will be exchanged over the polled connection that owns the scanner's slave I/O. Maximum size is 128 bytes.
Change of State / Cyclic	Values entered into Rx and Tx parameters define how much data will be exchanged over the change of state or cyclic connection that owns the scanner's slave I/O. Maximum size is 128 bytes.

Advanced Module Settings

Clicking on the Advanced button opens the following screen:
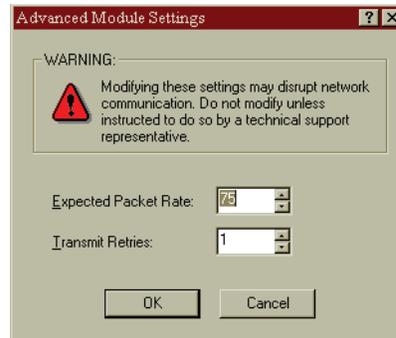
Expected Packet Rate (EPR)

When the scanner opens a polled or strobed I/O connection, it sets a maximum timeout (Expected Packet Rate) with the device. If the device does not receive a packet from the scanner within 4 times the EPR value, the slave device drops the connection. If the scanner does not receive a packet from the slave within 4 times the EPR value, it drops the connection and periodically attempts to open a new connection.

When a connection is dropped, status bits in the scanner identify that the slave is not online. Slave behavior when a connection is dropped is a function of the slave device. If the slave is an I/O device, the outputs will be cleared, held at last state, or set to a fault condition (refer to the slave device's documentation for actual I/O behavior when a connection is dropped).

The EPR default value is 75 ms.

IMPORTANT	Changing the EPR number should be done carefully because it effects how long it takes the scanner to detect a missing device.

Transmit Retries

Transmit Retries specifies the number of times the scanner attempts to retransmit a change of state or cyclic message that has not been acknowledged by the slave device. The connection is not necessarily dropped as a result of reaching the retry limit.

Scanlist Tab

The Scanlist defines which devices on the DeviceNet network are owned by the scanner.
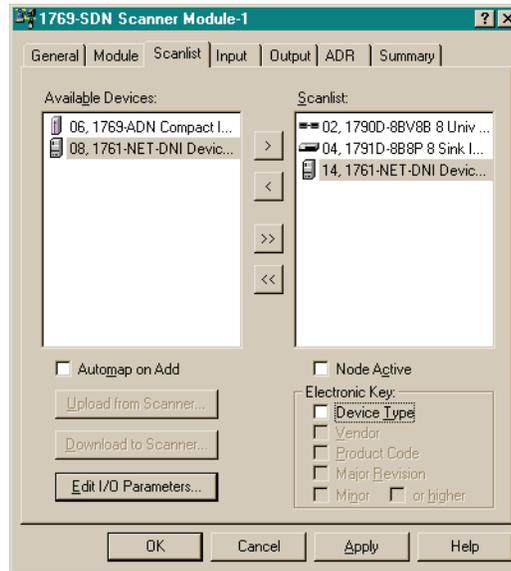
Available Devices

These are the devices on the network that have the ability to be slave I/O devices. Slave-capable devices do not have to be used as slave I/O by a scanner. They may alternately be used as slave I/O by another scanner on the same network, or they may have dual functionality. An example of a dual function device is the 1761-NET-DNI. The DNI can be used as slave I/O, or as a communications interface for PLC's or other DF1 full-duplex devices.

Scanlist

These devices have been assigned to be slave I/O to this scanner. A slave device on DeviceNet can only be owned by one master at a time. Devices in the scanlist are configured using the input and output tabs.

Automap on Add
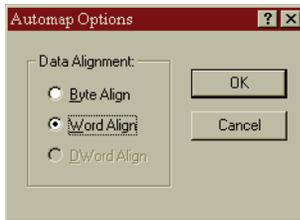
Automap allows a slave's I/O to be automatically mapped into the scanner's input or output image tables when the slave device is added to the scanlist. **DO NOT** check this box if you intend to map a slave device into a particular input or output memory location.

If you do select Automap, you will be prompted to choose how the data should be aligned in the scanner.

Edit I/O Parameters

These parameters will vary depending upon the slave device. Information on configurable parameters is usually provided in the device's documentation.

Electronic Key

The electronic key is used to ensure that a particular slave device always matches the intended device when the scanner initiates a connection to it. When one of the devices in the Scanlist section is highlighted, these boxes may be checked to indicate to what extent the key parameters must match the actual device on the network. A match of just Device Type can be selected or the additional parameters of Vendor Id, Product Code, Major Revision, and Minor Revision may be incrementally added. For the Major and Minor Revision keys, or higher may be selected to indicate that an exact match of the revision is required or some higher revision value.

Should the scanner detect a mismatch with any of the key parameters checked, an AutoVerify failure will occur for that slave device and the scanner will not continue the connection allocation process.

Input Tab

The input tab screen allows you to define how data from all of the scanner's slave devices are mapped into the input image of the controller.
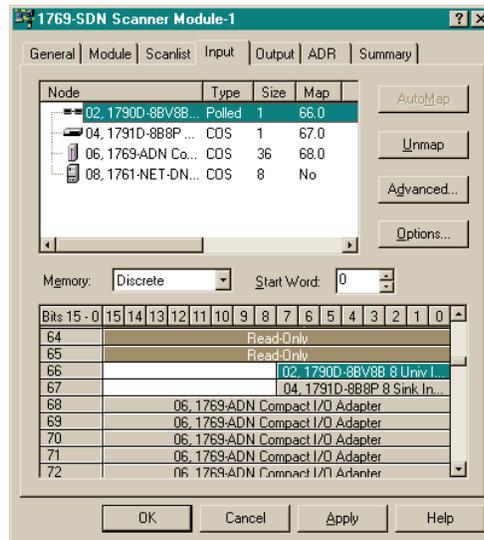
In this example we have 4 input devices that are mapped into the scanner's input image. The graphical window at the top of the dialog box shows each device's:

- Node number
- Catalog number
- Type of connection that is used between the scanner and the slave device (strobed, polled, cyclic or change of state)
- The amount of data that will be exchanged (in bytes)
- The word within the controller's input image where the data will appear

Advanced

The scanner allows each node's slave data to be broken up (segmented) into separate input image areas. This capability allows you to group data from multiple slave nodes into contiguous memory locations. This is simply an ease-of-use feature. For maximum performance, do not segment a slave device's data.
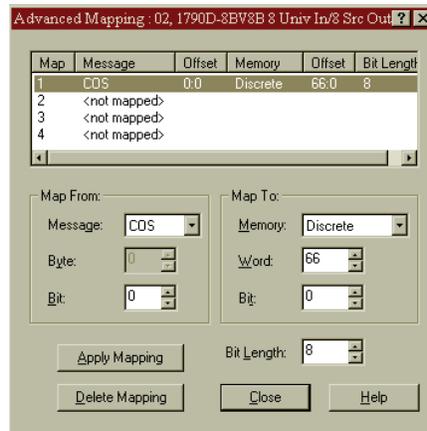
Output Tab

The output tab screen allows you to define how data from the scanner is mapped to the outputs of the slave devices.
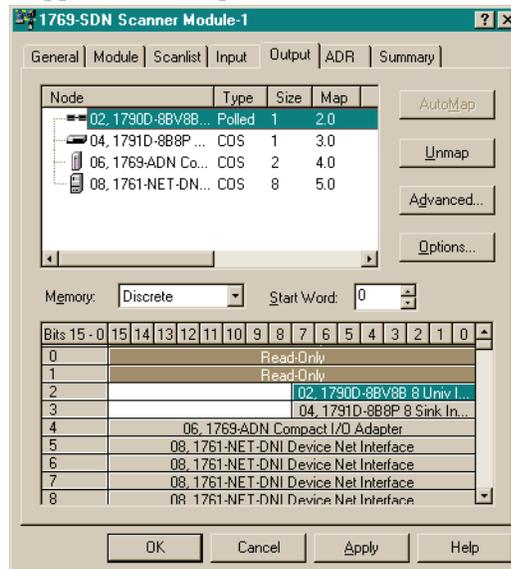
In this example we have 4 output devices that are mapped into the scanner's output image. The graphical window at the top of the dialog box shows each devices:

- Node number
- Catalog number
- Type of connection that is used between the scanner and the slave device (strobed, polled, cyclic or change of state)
- The amount of data that will be exchanged (in bytes)
- The word within the controller's output image

Auto Device Replacement (ADR) Tab

The Auto Device Replacement feature automates the replacement of a failed slave device on a DeviceNet network by returning it to the prior level of operation. This includes Configuration Recovery (CR) and Auto-Address Recovery (AAR).

CR allows a slave device to be removed from the network and replaced with an identical slave device configured at the same baud rate and node address as the device being replaced.

AAR allows a slave device to be removed from the network and replaced with another identical slave device that is residing on the network at node address 63 and is not in the scanners scan list. The replacement device will have its node address automatically changed to that of the device being replaced. Depending on the level of revision keying, it may be possible for the node address of the replacement device to be changed but not brought on-line due to a revision-keying mismatch.

The 1769-SDN scanner can handle any number of device failures simultaneously, however, the AAR feature will be disabled for devices that have the same electronic key. The CR feature will remain active. In this case, you must use the Node Commissioning Tool that ships with RSNetWorx for DeviceNet to change the node's address.

If the electronic key of the replacement device differs only by revision, the CR feature may not work. Before replacing any device, you should make sure that the configuration parameters of the replacement device are compatible with the existing device.

IMPORTANT	This behavior may introduce a possible safety hazard for device's such as drives. Use the full electronic key, including revision. To enable electronic key revision checking, you must be using a 1769-SDN scanner and RSNetWorx for DeviceNet.

Important Considerations

Keep the following in mind when using the ADR feature with RSNetWorx for DeviceNet:

- ADR is intended for use in single-master environments
- The CR and AAR features can only be used with devices that are in the scanlist of the scanner
- The AAR feature can only be enabled for a device if the CR feature is also enabled
- The CR feature cannot be enabled for devices that have no writable parameters (for example, a device that is entirely configured using hardware switches)

  RSNetWorx for DeviceNet will notify you of devices that have no writable parameters.

- The AAR feature will not work for devices that do not support changing the node address over the network

Configure ADR Parameters

On the ADR property page, you can configure the ADR parameters for the 1769-SDN scanner. Using the controls on this property page, you can select ADR parameters and enable or disable this functionality either globally or on a device-specific basis.

Configure each device on the network. If online, make sure that the configuration is synchronized with the online devices.

1. On the ADR property page, select the device you want to configure to use ADR.
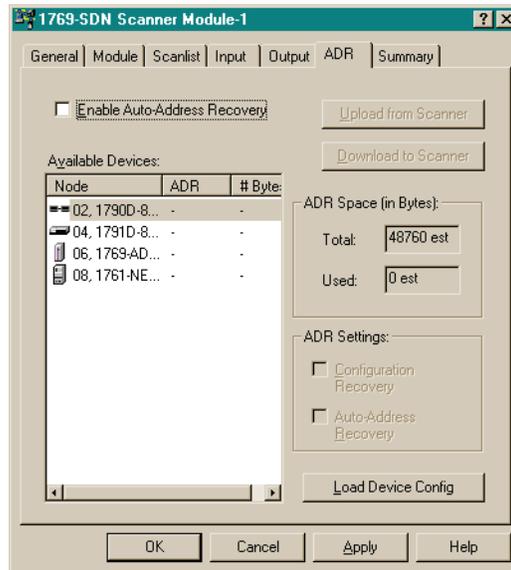
2. Click Load Device Config.

   This will load the configuration of each device selected into the scanner configuration software. If you are online, but did not upload the network, the configuration retrieved for the devices may not be what is actually used online.

3. Click the box next to Configuration Recovery.
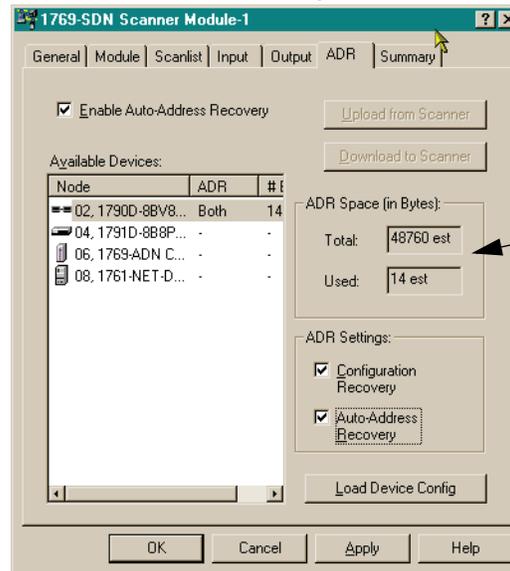
Notice the ADR space (in bytes) is displayed for the module you are updating.

4. Click the box next to Auto-Address Recovery if desired.

The Enable Auto-Address Recovery box needs to be checked in order for AAR to work.

5. Repeat steps 1-4 for each desired module.

Notice that Both indicates Configuration Recovery and Auto-Address Recovery are enabled while Config indicates that only Configuration Recovery is enabled.
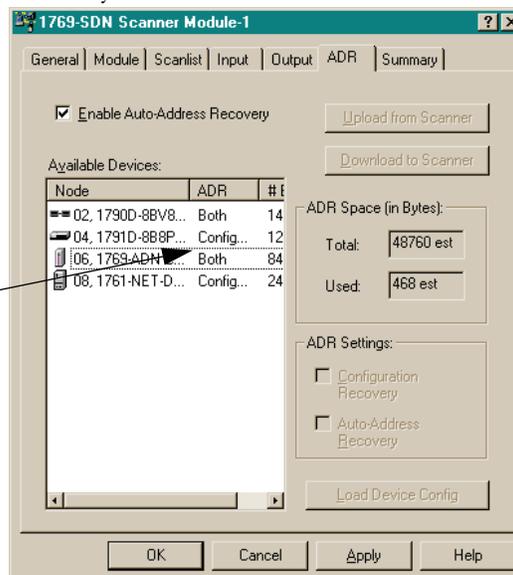
6. When finished, click Download to Scanner.

7. Click Apply or OK.

Summary Tab

The summary tab provides a condensed picture of the scanner's configuration: which nodes are mapped, if they are active and receive and transmit information
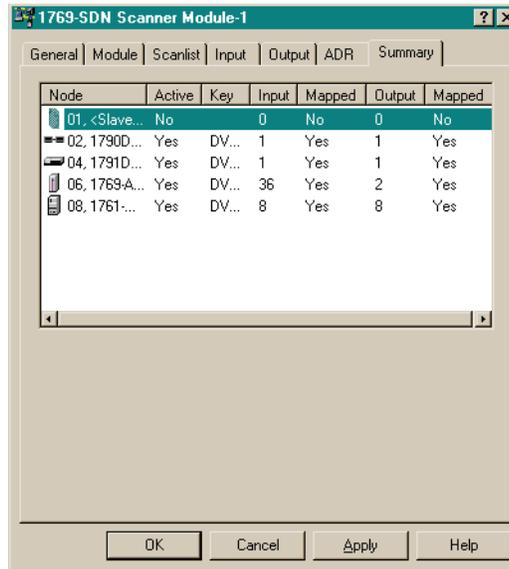
Download and Save Your Configuration

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

   You will see this window:
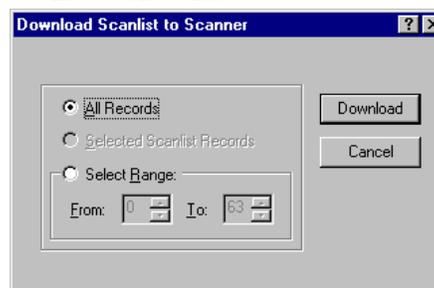
2. Select All Records.

3. Click on the Download button to download the configuration to the scanner.

4. Click on the OK button to complete the DeviceNet scanner configuration.

5. From the File menu select Save As.

6. Save the configuration to a DeviceNet file.

7. Close RSNetWorx.

Notes:

DeviceNet I/O Image

This chapter describes the input and output data structure. The following table describes what this chapter contains and where to find specific information.

For Information About	See Page
SDN Input File	5-1
Status Structure	5-2
Module Status Register	5-7
Input Data Image	5-7
SDN Output File	5-8
Output Data Image	5-9

SDN Input File

The 1769-SDN scanner module's input image is configurable up to 246 words. The input image is broken up into two primary components, the status area and the input data area.

Table 5.1 Input Image

Name	Size	Word Offset
Status Structure	66-words (fixed)	0…65
Input Data Image	180-word array (configurable)	66…245

Status Structure

The first area of the input image is the Status Structure. The status words are described in more detail in the following sections.

Table 5.2 Status Structure

Description	Words	Data Type
Scan Counter	0 and 1	2 words
Device Failure Array	2…5	64-bit array
Autoverify Failure Array	6…9	64-bit array
Slave Device Idle Array	10…13	64-bit array
Active Node Array	14…17	64-bit array
Reserved[1]	18…19	4-byte array
Scanner Status	20 and 21	4-byte array
Reserved Array[1]	22…31	20-byte array
Device Status Array	32…63	64-byte array
Module Status Register	64 and 65	2 words

[1]   **DO NOT** manipulate Reserved Bits. Doing so may interfere with future compatibility.

Scan Counter

This 32-bit unsigned value is incremented each time the DeviceNet network is scanned. The value will automatically roll over to zero and continue counting.

Device Failure Array

These 64 bits provide status information for use in your control program. For each slave device owned by the scanner the user should monitor the respective bit within these four words. If a slave device faults, the bit that corresponds to that node address will be set (1). If a slave device is not faulted or returns from a faulted state to an operating state, the corresponding bit for that node will be cleared (0).

Table 5.3 Slave Device Status Information

Input Word	Bit 0…Bit 15	Description
2[1]	Node 0…Node 15	Bit ON (1) = Slave node faulted
3[2]	Node 16…Node 31	Bit OFF (0) = Slave node not faulted
4[3]	Node 32…Node 47	
5[4]	Node 48…Node 63	

[1]   Bit 0 corresponds to Node 0, Bit 1 corresponds to Node 1 … Bit 15 corresponds to Node 15.

[2]   Bit 0 corresponds to Node 16, Bit 1 corresponds to Node 17 … Bit 15 corresponds to Node 31.

[3]   Bit 0 corresponds to Node 32, Bit 1 corresponds to Node 33 … Bit 15 corresponds to Node 47.

[4]   Bit 0 corresponds to Node 48, Bit 1 corresponds to Node 49 … Bit 15 corresponds to Node 63

Autoverify Failure Array

These four words allow the control program to monitor if a slave's Device Key and Size matches the Device Key and Size in the scanner. A bit value of 0 (OFF) represents a configuration match, a bit value of 1 (ON) represents a mismatch.

ATTENTION	A value of 0 **DOES NOT** indicate that the slave has been brought online or is functional, only that there is a configuration match between the slave and the scanner.

Table 5.4 Slave Device Configuration Comparison to Scanner Configuration

Input Word	Bit 0 to Bit 15	Description
6[1]	Node 0…Node 15	Bit ON (1) = Slave node mismatch
7[2]	Node 16…Node 31	Bit OFF (0) = Slave node match
8[3]	Node 32…Node 47	
9[4]	Node 48…Node 63	

[1] Bit 0 corresponds to Node 0, Bit 1 corresponds to Node 1 … Bit 15 corresponds to Node 15.

[2] Bit 0 corresponds to Node 16, Bit 1 corresponds to Node 17 … Bit 15 corresponds to Node 31.

[3] Bit 0 corresponds to Node 32, Bit 1 corresponds to Node 33 … Bit 15 corresponds to Node 47.

[4] Bit 0 corresponds to Node 48, Bit 1 corresponds to Node 49 … Bit 15 corresponds to Node 63

Slave Device Idle Array

The slave device idle array contains 64 bits of data. Each bit indicates the state of a slave device. A bit value of 0 represents a non-idle mode or that the slave is not present in the scanlist. A bit value of 1 represents idle mode where the slave node is present in the scanlist.

Table 5.5 Slave Device Status

Input Word	Bit 0 to Bit 15	Description
10[1]	Node 0…Node 15	Bit ON (1) = idle
11[2]	Node 16…Node 31	Bit OFF (0) = non-idle
12[3]	Node 32…Node 47	
13[4]	Node 48…Node 63	

[1] Bit 0 corresponds to Node 0, Bit 1 corresponds to Node 1 … Bit 15 corresponds to Node 15.

[2] Bit 0 corresponds to Node 16, Bit 1 corresponds to Node 17 … Bit 15 corresponds to Node 31.

[3] Bit 0 corresponds to Node 32, Bit 1 corresponds to Node 33 … Bit 15 corresponds to Node 47.

[4] Bit 0 corresponds to Node 48, Bit 1 corresponds to Node 49 … Bit 15 corresponds to Node 63

Active Node Array

The Active Node array contains 64 bits of data that represents each slave node's status. A slave node is considered active when it is present and enabled in the master's scanlist. A bit value of 0 means Not Active, a bit value of 1 means Active.

Table 5.6 Slave Node Status

Input Word	Bit 0 to Bit 15	Description
14[1]	Node 0…Node 15	Bit ON (1) = Active node
15[2]	Node 16…Node 31	Bit OFF (0) = Inactive node
16[3]	Node 32…Node 47	
17[4]	Node 48…Node 63	

[1]   Bit 0 corresponds to Node 0, Bit 1 corresponds to Node 1 … Bit 15 corresponds to Node 15.

[2]   Bit 0 corresponds to Node 16, Bit 1 corresponds to Node 17 … Bit 15 corresponds to Node 31.

[3]   Bit 0 corresponds to Node 32, Bit 1 corresponds to Node 33 … Bit 15 corresponds to Node 47.

[4]   Bit 0 corresponds to Node 48, Bit 1 corresponds to Node 49 … Bit 15 corresponds to Node 63

Scanner Status

The Scanner Device Status is a 4-byte array.

Table 5.7 Scanner Device Status

Input Word	Bit	Description
20	0…7 (lower byte)	Scanner Address in BCD
	8…15 (upper byte)	Scanner Status in BCD
21	0…7 (lower byte)	Slave Device Address in BCD
	8…15 (upper byte)	Slave Device Status in BCD

Reserved Array

Table 5.8 Reserved Array

Input Word	Description[1]
22…31	Always 0

[1] **DO NOT** manipulate Reserved Bits. Doing so may interfere with future compatibility.

Device Status Array

The Device Status Array is a 64-byte array containing the information shown in the following table. Each byte indicates the status code of the scanner's master and the slave devices.

Table 5.9 Device Status

Input Word	Bit	Description
32	0…7 (lower byte)	Node 0 DeviceNet Status
	8…15 (upper byte)	Node 1 DeviceNet Status
33	0…7 (lower byte)	Node 2 DeviceNet Status
	8…15 (upper byte)	Node 3 DeviceNet Status
…	…	…
63	0…7 (lower byte)	Node 62 DeviceNet Status
	8…15 (upper byte)	Node 63 DeviceNet Status

Module Status Register

The scanner supports a 32-bit Module Status Register.

Table 5.10 Scanner Module Status Register

Input Word	Bit	Description	Operation
64	0	Run	Bit ON (1) = scanning I/O Bit OFF (0) = halted
	1	Fault	Bit ON (1) = faulted Bit OFF (0) = not faulted
	2	Network Disable	Bit ON (1) = disabled Bit OFF (0) = not disabled
	3	Device Failure	Bit ON (1) = failure
	4	Autoverify Failure	Bit OFF (0) = no failure
	5	Communication Failure	
	6	Duplicate Node Failure	
	7	DeviceNet Power Detect	Bit ON (1) = power Bit OFF (0) = no power
	8 to 15	Reserved[1]	n/a
65	0 to 15	Reserved[1]	n/a

[1]   **DO NOT** manipulate Reserved Bits. Doing so may interfere with future compatibility.

Input Data Image

The Input Data Image can be up to a 180-word array as shown below:

Table 5.11 Input Data Image

Word Offset	Description
66…245	DeviceNet Slave input and/or master output data

The Input Data Image is mapped using RSNetWorx for DeviceNet configuration software.

SDN Output File

Output Array

The scanner supports up to 182 output words. This array is broken up into two distinct data segments.

Table 5.12 Output Array

Name	Size	Word Offset
Module Command Array	2 words	0 and 1
Output Data Image	180-word array	2…181

Module Command Array

The module command array is the primary control interface between your control program and the module.

Table 5.13 Module Command Array

Output Word	Bit	Description	Behavior
0	0	Run	This bit controls when the module scans its mapped slave devices. When set (1), the scanner will process I/O data as defined by its scanlist. To actually scan the network the Fault and Disable Network command bits must be clear (0).
	1	Fault	When set, the scanner's I/O mode will be Halt; messaging will still operate. The fault bit is primarily used to artificially set the slave devices into a fault state due to some event or condition within the control program.
	2	Disable Network	When set, the scanner is functionally removed from the network.
	3	Reserved[1]	n/a
	4	Reset	Restarts access to the DeviceNet network.
	5…15	Reserved[1]	n/a
1	16…31	Reserved[1]	n/a

[1]   **DO NOT** manipulate Reserved Bits. Doing so may interfere with future compatibility.

Output Data Image

The Output Data Image can be up to a 180 word array. The controllers output data will be delivered across DeviceNet to the destination slave devices. The scanner's scanlist configuration will determine how this data is actually sent to the slave device (polled, cyclic, or change of state).

Table 5.14 Output Data Image

Output Word	Description
2…181	DeviceNet Slave output and/or master input data

Slave mapping is done using RSNetWorx.

Notes:

Using the 1769-SDN Scanner Module with CompactLogix Controllers

For information on using the 1769-SDN scanner module with CompactLogix controllers, refer to the DeviceNet Modules in Logix5000 Control Systems User Manual, publication DNET-UM004.

Notes:

Using the 1769-SDN Scanner Module with MicroLogix Controllers

This chapter contains an example where the 1769-SDN scanner module is used with a MicroLogix 1500 controller. The following table describes what this chapter contains and where to find specific information.

For Information About	See Page
MicroLogix 1500 Controllers	7-1
RSLogix 500 I/O Configuration	7-2
Backplane Messaging	7-8
Program Upload/Download	7-9
Configuring a Local DeviceNet Message	7-11

MicroLogix 1500 Controllers

The MicroLogix 1500 programmable controller has two different processors that are compatible with the 1769-SDN scanner module. The 1764-LSP and 1764-LRP processors can use the scanner as a DeviceNet master and own DeviceNet slave devices. This allows either processor to communicate with intelligent devices like drives, scales, starters and many others, or use DeviceNet to expand the processors I/O capabilities/capacity.

The 1764-LRP processor allows messaging functionality over DeviceNet, so non-I/O data may be exchanged. Multiple 1769-SDN scanner modules may be used in a 1764-LRP system, however only the first two scanners can be used for messaging.

The amount of power that modules draw from the processor or expansion power supply, and the amount of data that the processor can support will determine how many can be used. To determine if an application can be supported, configuration tools are available from http://www.ab.com/micrologix.

In addition to electrical limitations, data space limitations also exist. The maximum size of the input and output images for each module in the system is 250 input and 250 output words of data.

RSLogix 500 I/O Configuration

One of the advanced features of RSLogix 500 is the ability to have the programming software establish a communications connection with the controller and read which I/O modules are attached to the controller. This capability significantly reduces the effort involved in configuring a system.

This section will illustrate how to read which I/O modules are attached to the controller, and manually configure them.   We will then configure the scanner. An example network is shown below:

DeviceNet Network

PC with RSNetWorx
for DeviceNet Software

MicroLogix 1500 Controller I/O
Bank with 1769-SDN Module

1770-KFD PC
Communication
Module

Series 9000
Photoeye

RediSTATION

MicroLogix 1000 Controller
Connected via 1761-NET-DNI

MicroLogix 1200 Controller
Connected via 1761-NET-DNI

1305 Drive Connected via 1203-GU6
Enhanced DeviceNet Communications Module

Starting the Project

1. Open RSLogix 500.

2. Select File.

3. New.

4. Choose MicroLogix 1500 LRP series C.

   The screen capture below should match what you see on your computer.
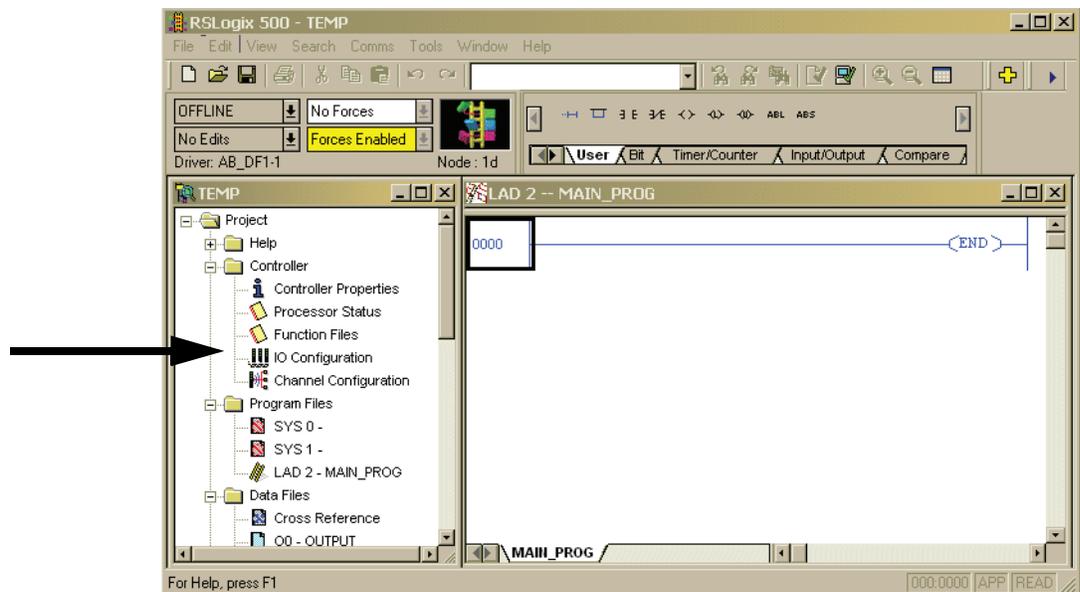
   In this example the name for this application is TEMP. In the TEMP window you see everything associated with the application. Within the Controller folder you will see I/O Configuration.

5. Double click I/O Configuration.

I/O Configuration Screen
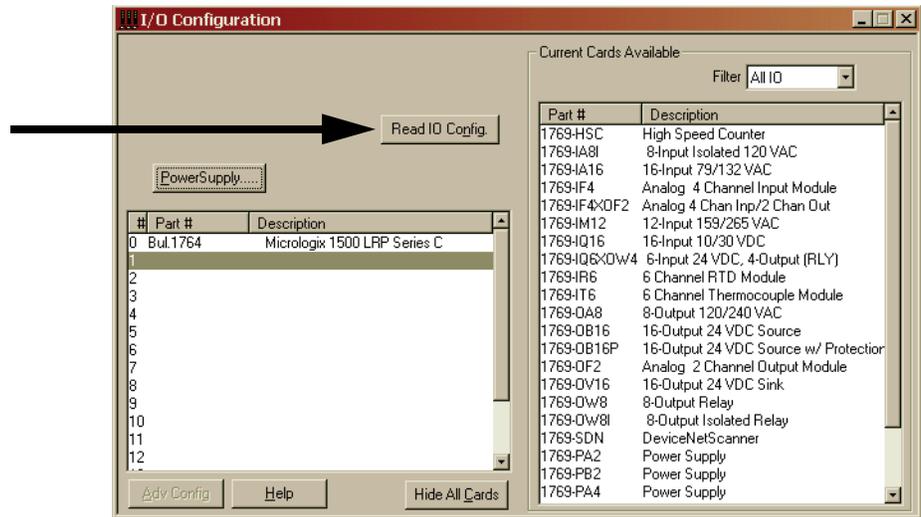
The I/O configuration screen shows each of the controllers I/O slots. For the MicroLogix 1500 controller, slot 0 contains the embedded I/O that is part of the MicroLogix 1500 base unit. Slots 1 through 16 are for Compact I/O expansion modules (referred to as local I/O, because they are physically attached to the controller). Slots 9 through 16 are only available using a Series C processor with a Series B base unit[1].

To have RSLogix 500 read the controller's local I/O and configure the slots automatically, select the Read I/O Config button.

To manually configure the controller I/O, simply drag the appropriate modules from the available list (right window), to the appropriate slot on the left. Note, you cannot have open slots, modules must be contiguous from 1 to 16.

[1]   Series B base units will be available late in 2001. Contact your local Allen-Bradley distributor for availability.

Read I/O Configuration
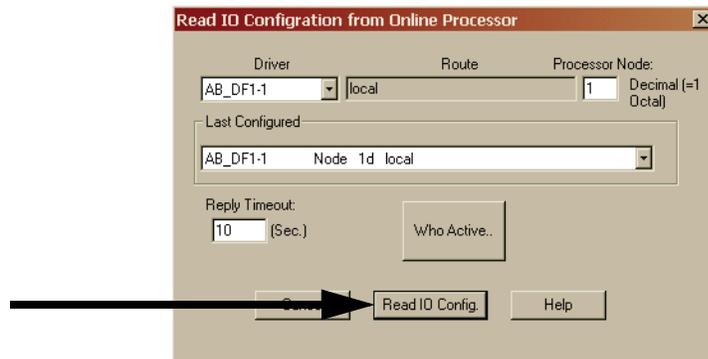
The next screen that appears is a communications dialog that allows you to select a communication path using RSLinx to the MicroLogix controller.

If you have previously connected to a controller, the communications driver that you used before will be the active driver. This dialog screen provides the ability to change the driver or perform a Who Active across a network to locate the specific MicroLogix controller.

If the driver and path are correct, select Read I/O Config.

Installed I/O
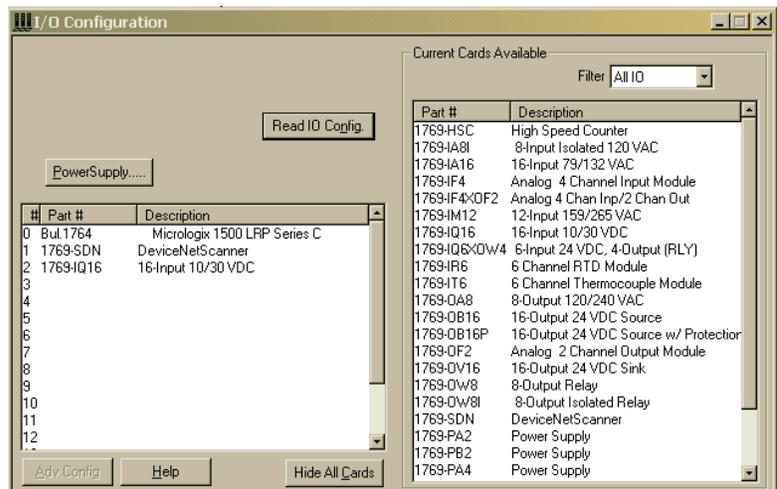
RSLogix 500 then displays all of the I/O modules that are attached to the MicroLogix controller.

In this example, there is a 1769-SDN scanner module at slot 1, and a 16-point digital input module in slot 2.

1769-SDN Scanner Module Configuration

To configure a specific module, simply double-click on the module. To configure the scanner in this example, double-click on the module in slot 1.

Input Words

This is the number of input words the controller assigns to the module. The first 66 words (0 to 65) are required by the scanner for status. DeviceNet slave input data words start at slot word 66. You can have a maximum of 180 input words for DeviceNet slave devices (maximum slot amount for 1769-SDN scanner module inputs = 246).

Output Words

This is the number of output words the controller assigns to the module. The first 2 words (0 and 1) are required by the scanner for status. DeviceNet slave output data words start at slot word 2. You can have a maximum of 180 output words for DeviceNet slave devices (maximum slot amount for scanner outputs = 182).

Changing the 1769-SDN Configuration
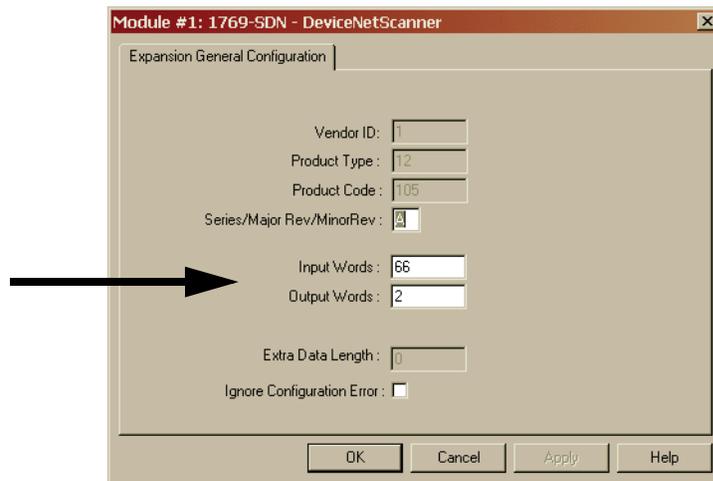
Changing (adding or removing) the amount of data the controller has assigned to the scanner is done in the expansion module configuration screen. From within RSLogix 500, I/O configuration, open the 1769-SDN scanner module and change the input or output words as needed. Save the program and download to the Controller.

Reducing the number of words for either inputs or outputs will require a change in the 1769-SDN's scanlist, which is done using RSNetWorx.

IMPORTANT	It is recommended that you **NOT** reduce the number of words assigned to a 1769-SDN's scanlist once a system is operational. Changing the number of words may cause addressing problems on the controller side, and mapping changes on the DeviceNet network.
	Adding words to an existing system is relatively easy to do, because it doesn't affect existing addresses or mapping. Simply add the number of additional words that are needed in the module (using the above example), and change the scanlist using RSNetWorx.

The configuration screen for the scanner is shown below.
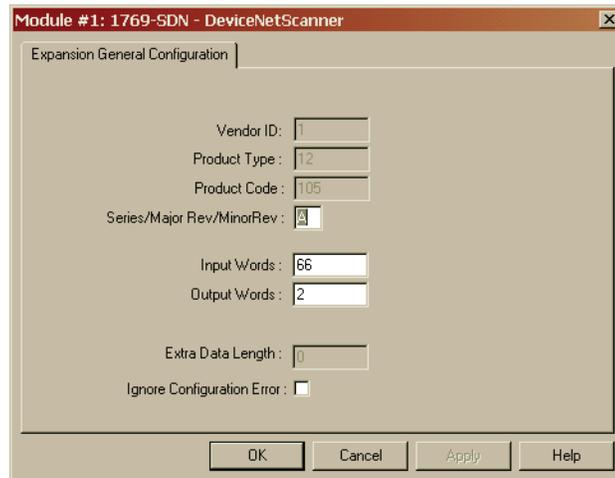
Ignore Configuration Error

Checking (enabling) this box instructs the module to ignore I/O size mismatches. If this is checked and the input/output scanlist configured by RSNetWorx (DeviceNet side of the 1769-SDN) does **NOT** match the amount of I/O data assigned by the controller (0 to 180 words), the module will not generate an error.

If this box is not checked, the number of data words on the controller side must match the number of words configured by RSNetWorx. The default condition is unchecked (report an error on mismatch).

Series/Major Rev/Minor Rev

You will need this information if you contact Rockwell Automation Technical Support.

Backplane Messaging

The MicroLogix 1500 1764-LRP processor and the 1769-SDN scanner module also support backplane messaging. This new level of functionality allows the processor to read (get) or write (set) data to other devices on DeviceNet. This is also referred to as Explicit Messaging.

You can use two different types of messages to exchange information with the DeviceNet device. The type of message used is determined by the destination device. You can generate a PCCC message or a CIP message.

PCCC Messaging

PCCC stands for Programmable Controller Communications Commands. PCCC provides point to point and master/slave communications between devices. PCCC is an open protocol that is built into all Allen-Bradley controllers, and many other Allen-Bradley and third-party products.

PCCC messaging has been used for many years on DH-485, DH+ and Ethernet networks, and for point-to-point communications between Allen-Bradley controllers. PCCC messaging allows program upload/download to occur over DeviceNet, and allows users to message across DeviceNet, just like they did using DH-485 or DH+. There are a number of devices that support PCCC messaging over DeviceNet, including the 1761-NET-DNI (DNI), 1203-GU6 interface, and RSLinx. If the DeviceNet network has DNI's, either device can initiate a PCCC message.

Program Upload/Download

Before performing a program upload/download through the scanner, be sure that the module is properly installed in the system, and that a terminator is present at the end of the Compact I/O expansion bus.

IMPORTANT	DeviceNet networks can operate at 125 K, 250 K, or 500 K baud. Depending on network size and communication activity, performing program upload and/or download operations while the network is controlling an application may impact control system performance. It is up to the user to know and understand how upload/download will impact their operations.

To perform program upload/download using RSLogix 500, select Comms. From the drop-down menu, select System Comms.
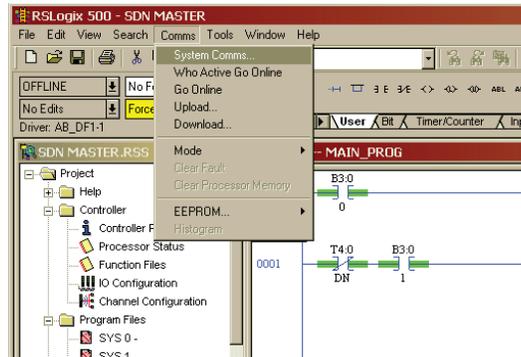
System Comms will generate an RSLinx screen similar to the example below.
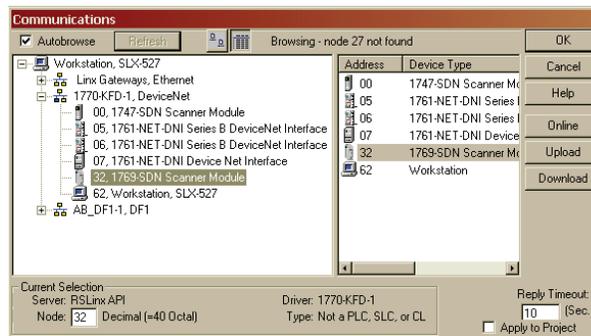
In this example, the DeviceNet interface is a 1770-KFD module. Selecting the 1770-KFD driver will show the devices on the DeviceNet network.

In this example, upload/download can be performed with the devices at nodes 5, 6, 7 and 32. Node 32 is a 1769-SDN. Simply highlight the 1769-SDN and then click on either the upload or download button on the right side of the screen.

Configuring a Local DeviceNet Message

This section describes how to configure a local message using the scanner and a MicroLogix 1500 1764-LRP processor.

Message Setup Screen
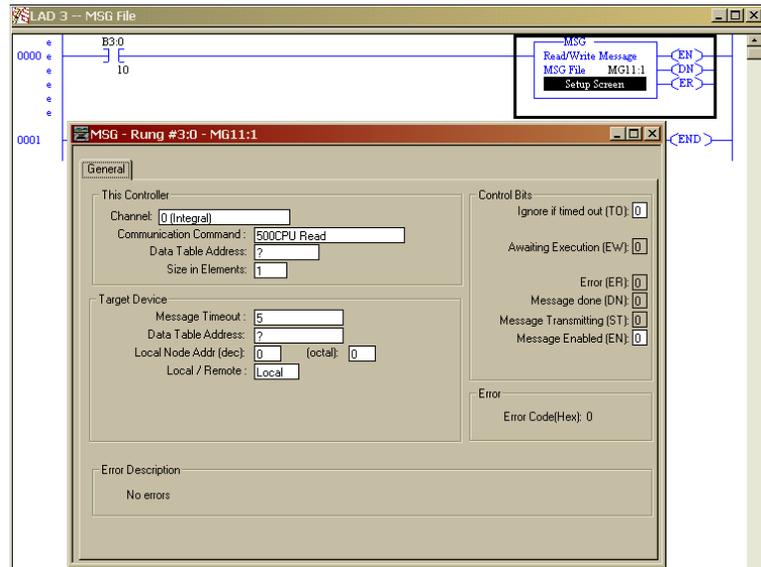
Rung 0 shows a standard RSLogix 500 message (MSG) instruction preceded by conditional logic.

Access the message setup screen by double-clicking the Setup Screen.

The RSLogix 500 Message Setup Screen appears. This screen is used to setup or monitor message parameters for This Controller, Target Device, and Control Bits. Descriptions of each of these sections follow.

This Controller Parameters

Channel

The 1764-LRP supports three different pathways for messaging, channels 0 and 1 are RS-232 ports and are functionally identical to MicroLogix 1200 and MicroLogix 1500 1764-LSP controllers. The 1764-LRP also supports backplane communications through the Expansion Communication Port (ECP) as illustrated below.
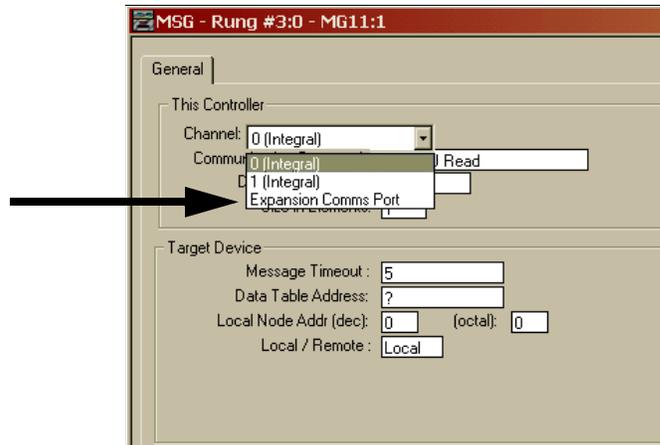
When ECP is chosen, you are able to select which slot position (1 to 16) the scanner resides in. The 1764-LRP processor can support up to two 1769-SDN scanner modules with full messaging functionality.
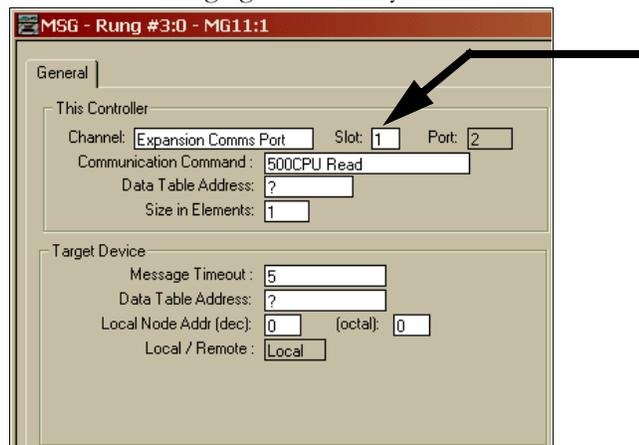
You can use multiple 1769-SDN scanner modules in a MicroLogix 1500 system, but you can only message through the first two. Any other 1769-SDN scanner can only be used for I/O scanning.

Communication Command
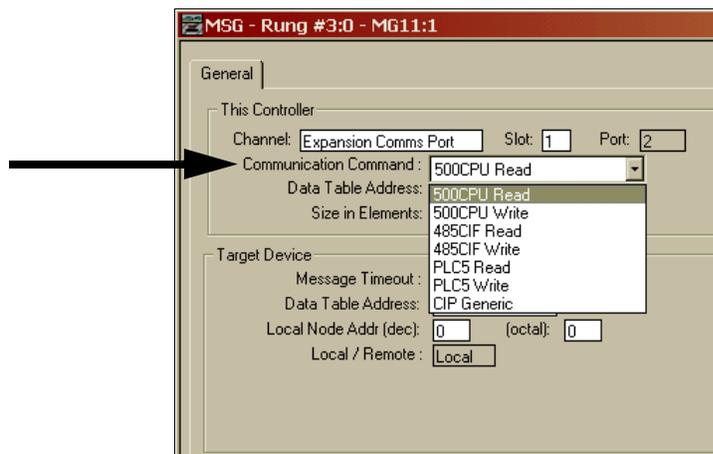
The 1764-LRP processor supports the six standard types of communications commands (same as all other MicroLogix 1200 and 1500 controllers) and CIP Generic. When any of these six standard commands are chosen, you can initiate standard messages to destination devices connected to DeviceNet products that support PCCC messaging (including MicroLogix and SLC controllers using 1761-NET-DNI's, other MicroLogix 1500 controllers using 1769-SDN scanner modules, etc.). You can initiate reads, writes, program upload/download and online monitoring across DeviceNet. This is functionally identical to DH-485 and DH+ networking.

CIP Generic

CIP stands for Control & Information Protocol. CIP is a newer and more versatile protocol than PCCC. It is an open protocol that is supported by newer Allen-Bradley controllers and third-party products.

CIP messaging is the native messaging format for DeviceNet. All DeviceNet devices are compliant with CIP messaging. The MicroLogix 1500 1764-LRP processor (Series C) has an enhanced message instruction that provides simple, easy to use CIP messaging.

Selecting CIP Generic configures the message instruction to communicate with DeviceNet devices that do not support PCCC messaging. When CIP Generic is chosen, you will notice that a number of message parameters change and many new ones become available depending upon the service selected.
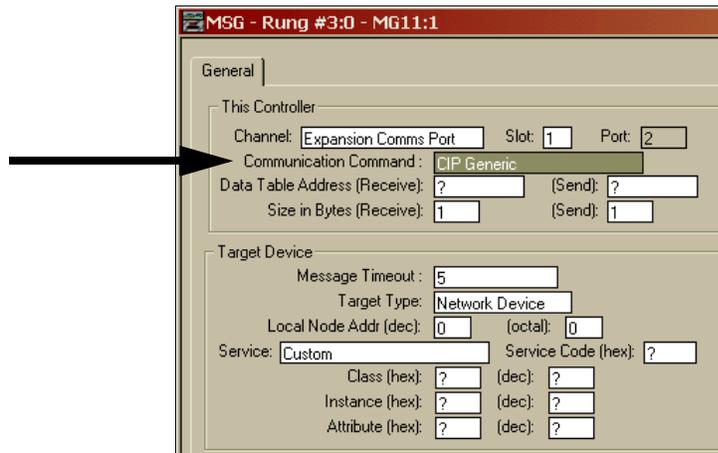
Data Table Address (Receive and Send)

This value identifies the data file location within the 1764-LRP controller that will receive data from the DeviceNet device, and/or the starting data file location that will be sent to the destination DeviceNet device.

Size in Bytes (Receive and Send)

Since all data transmitted on DeviceNet is byte based, you must enter the number of bytes that will be received and sent. You must make sure that enough memory is available in the destination device. Word elements within 1764-LRP controllers contain 2 bytes each. These include Bit and Integer data files. Long word and Floating point elements contain 4 bytes each.

For receive, the Size in Bytes entered must be greater than or equal to the number of bytes than the DeviceNet device will return. DeviceNet devices return a fixed number of bytes depending on the Class and Service. If more data is returned than expected, the message will error and no data will be written. If less data is returned than expected, the data will be written and the remainder of the bytes will be filled with zeros.

In the example screen shown below, N7:0 will receive 2 bytes (1 word) of data.

Target Device

Message Timeout

Message timeout is specified in seconds. If the target does not respond within this time period, the message instruction will generate a specific error. The amount of time that is acceptable should be based on application requirements and network capacity/loading.

Target Type

You can select either Module or Network Device. If you need to message to a device on DeviceNet, select Network Device. If you need to message to a DeviceNet parameter on the scanner, select Module. This allows the control program access to module parameters. Many of the module parameters are not editable, and some can only be edited when the module is in Idle Mode.

Local Node address

This is the target device's DeviceNet node number.

Service

DeviceNet uses services to provide specific messaging functions. A number of standard services with their corresponding parameters have been preconfigured for ease of use.

If you need to use a service that is not available, select one of the Generic services. The Generic service allows you to enter specific service code parameters. Information on what services a target device supports is usually provided in the device's documentation.

MSG Instruction Error Codes

When the processor detects an error during the transfer of Expansion I/O Communication Module message data, the processor sets the ER bit and writes an error code at MG file subelement #18 that you can monitor from your programming software.

Table 7.1 1769-SDN Module Error Code

Error Code	Description
E0H	Expansion I/O Communication Module Error.

The processor also writes general status information related to this error at the high byte of MG file subelement #22 that can be monitored from your program.

Table 7.2 Error Status Information

General Status	Description
01H	Illegal or unsupported service parameter
02H	Resource unavailable
04H	Segment type error in IOI
07H	Connection lost
08H	Service not supported
09H	Invalid attribute value
0BH	Already in requested mode/state
0CH	Object state conflict
0EH	Attribute not setable
10H	Device state conflict
11H	Reply data too large
13H	Not enough data
14H	Attribute not supported
15H	Too much data
16H	Object does not exist
19H	Store operation failure
20H	Invalid parameter
28H	Invalid member ID

Troubleshooting

The 1769-SDN scanner module is provided with LED diagnostic indicators on its front panel. The diagnostics provided by these indicators are described in this chapter.

For Information About	See Page
Diagnostic Indicators	8-1
Error Codes	8-3

Diagnostic Indicators

The first step in troubleshooting is to observe the 1769-SDN scanner module's LEDs and 7-segment numeric displays. The indicators function as follows:

- The bicolor (green/red) Module Status LED indicates whether the scanner has power and is functioning properly
- The bicolor (green/red) Network Status LED provides information about the DeviceNet channel communication link
- The numeric display shows Node Address and Status Display information

  Status information precedes the node address.

The following table summarizes the meanings of the LEDs and numeric codes.

Module LED

Network LED

DeviceNet

ADDRESS/ERROR

Node Address and
Status Display
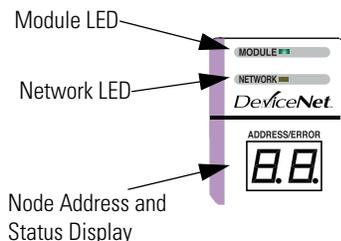
Table 8.1 Troubleshooting the LEDs and Numeric Display

Indicator	Color/Status	Indicates	Recommended Action
Module	Off	No power applied to module.	Apply power.
	Flashing Green	No Bus Master (MicroLogix or CompactLogix controller) present.	Verify module connectors are properly seated. If they are, cycle power to the controller. If this does not correct the problem, replace the controller. If replacing the controller does not correct the problem, replace the scanner.
	Solid Green	Normal operation.	No action required.
	Flashing Red	Recoverable Fault - Memory has been erased or is being programmed.	Complete flash update or start a new update.
	Solid Red	Unrecoverable fault	Verify module connectors are properly seated. If they are, verify that bus terminator/end cap is installed. Cycle power. If still faulted, replace the module.
Network	Off	No module power, no network power, or communications are not occurring between the module and the DeviceNet network. (This may be an acceptable condition.)	Verify module has power. Check that the DeviceNet cable is securely connected and the DeviceNet network is powered. Verify that network power is adequate (11 to 25V dc).
	Flashing Green	Device is operational. There are no connections established with any of the network devices.	If the module is supposed to be controlling DeviceNet slaves, configure the module's scanlist.
	Solid Green	Normal operation. Scanlist is configured. Module is not in Idle mode.	No action required.
	Flashing Red	One or more of the devices that the scanner is communicating with is in a timed out state.	Monitor the status display, or the module's status field to determine which slave device is offline.
	Solid Red	Critical network failure. Duplicate DeviceNet node address detected.	Reset module. Change module's node address or change conflicting device's node address. If failure continues, replace module.
7-Segment Numeric Display	Node Address and Status Display	Indicates diagnostic information about the status of the module. • When the numeric display is showing 0 to 63, it is indicating the scanner's DeviceNet node address. • When it shows 70 to 99, it indicates an Error Code for the displayed node address. • When it flashes alternating numbers, one is the Error Code (70 to 99), and the other is the Node Number (0 to 63) that has generated the error.	

Error Codes

The following table describes the Error Codes indicated by the 7-segment numeric display.

Table 8.2 Device Status

Code (decimal)	Name	Description	Recommended Action
70	Duplicate Node	Controller has Failed Duplicate Node Address Check. The node address selected is already in use.	Change the module's or conflicting device's network address (node number) to an available one.
71	Illegal Scanlist Data	Illegal data in scanlist.	Reconfigure the scanlist table and remove any illegal data.
72	Slave Timeout	One of the module's slave devices has stopped communicating.	Inspect the module's slave devices and verify the DeviceNet connections.
73	Electronic Key Mismatch	The slave device Vendor ID key parameter does not match the slave's configuration in the module's scanlist.	Make sure that the device at the flashing node address matches the desired electronic key (vendor, product code, product type)
75	No Messages Received	No network traffic received by the scanner. 10 seconds have elapsed and no network traffic for the module or for any other device have been received by the module.	Verify the scanlist is correctly configured to scan slave devices. Verify DeviceNet network connections.
76	No Message For Scanner	No direct network traffic for the scanner detected. 10 seconds elapsed and no DeviceNet input being screened by the module has been received.	None. There are other active devices on the network, initiating messages, but none of the messages are for the module.
77	Slave Data Size Mismatch	The data being received from the slave device does not match the configuration in the scanlist.	Either reconfigure the slave device, or change the module's scanlist to match the slave device.
78	No Such Device	Slave device in scanlist does not exist.	Either add the device to the DeviceNet network, or delete the device's entry in the scanlist.
79	Transmit Failure	The module has failed to transmit a message.	Make sure that the module is connected to a valid network. Check for disconnected cables.
80	In Idle Mode	Module is in IDLE mode.	Put the controller into RUN mode and enable the RUN bit in the Module Command Array. See page 5-8.
81	Scanner Faulted	The Scanner has stopped producing and consuming I/O data. This condition does not affect the scanner's system or messaging modes.	Check the FAULT value in the Module Command Array. See page 5-8.
82	Fragmentation Error	Error detected in sequence of fragmented I/O messages from device.	Check scanlist table entry for slave device to make sure that input and output data lengths are correct. Check slave device configuration.
83	Slave Init Error	Slave device is returning error responses when the module attempts to communicate with it.	Check slave device's configuration. Reboot slave device.

Table 8.2 Device Status

Code (decimal)	Name	Description	Recommended Action
84	Not Yet Initialized	Module has not completed its initial attempt to establish communications with its slaves.	None. This code clears itself once the module properly initializes all slave devices on the network.
85	Receive Buffer Overflow	Data size returned is larger than expected.	Configure the slave device for a smaller data size.
86	Device Went Idle	Device is producing idle state.	Check the device configuration and slave node status.
89	Auto Device Replacement (ADR) Error	Slave device responded with an error to the initialization data sent to it by the scanner; or the configuration table in the scanner's flash memory is not valid for a slave node.	Try the ADR download again. If it still fails, try clearing the ADR flash by downloading an empty ADR configuration to the scanner and then try the ADR configuration again.
90	Disabled Network	DeviceNet Port is Disabled	Check for the DISABLE being set in the Module Command Array. See page 5-8.
91	Bus Off	Bus off condition detected on integral DeviceNet port.	Check the DeviceNet connections and physical media integrity. Check system for failed slave devices or other possible sources of network interference. Check the Baud Rate.
92	No DeviceNet Power	No network power detected on DeviceNet port.	Provide network power. Make sure the module drop cable is providing the proper power to the DeviceNet port.
95	FLASH Update	Flash Update In Progress	None. **DO NOT** disconnect the module from the network while a FLASH update is in progress.
98	Firmware Corrupted	Firmware is corrupted.	Reflash module firmware. **DO NOT** power cycle the module. Doing so may cause the module to become inoperable. If the problem persists contact Rockwell Automation Technical Support.
99	Hard Fault		Cycle Power. Reflash module firmware. Contact Rockwell Automation Technical Support.

Specifications

This appendix contains the product specifications for the 1769-SDN DeviceNet Scanner Module.

For Information About	See Page
General Specifications	A-1
Electrical and DeviceNet Specifications	A-2
Dimension Drawings	A-3
Compact I/O with CompactLogix Controller and Power Supply	A-3
Compact I/O with MicroLogix 1500 Base Unit and Processor	A-4

General Specifications

Specification	Value
Module Dimensions	118 mm (height) x 87 mm (depth) x 35 mm (width) height including mounting tabs is 138 mm 4.65 in (height) x 3.43 in (depth) x 1.38 in (width) height including mounting tabs is 5.43 in.
Approximate Shipping Weight (with carton)	280 g (0.61 lbs)
Storage Temperature	-40 °C…+85 °C (-40 °F…+185 °F)
Operating Temperature	0 °C…+60 °C (32 °F…+140 °F)
Operating Humidity	5…95% non-condensing
Operating Altitude	2000 m (6561 ft)[1]
Vibration, Operating	Operating: 10…500 Hz, 5 g, 0.030 in maximum peak-to-peak
Shock, Operating	30 g panel mounted (20 g DIN rail mounted)
Shock, Nonoperating	40 g panel mounted (30 g DIN rail mounted)
Agency Certification	• C-UL certified (under CSA C22.2 No. 142) • UL 508 listed • CE and C-Tick compliant for all applicable directives • ODVA DeviceNet conformance tested
Hazardous Environment Class	Class I, Division 2, Hazardous Location, Groups A, B, C, D (UL 1604, C-UL under CSA C22.2 No. 213)
Radiated and Conducted Emissions	EN50081-2 Class A

Specification	Value
Electrical /EMC:	*The module has passed testing at the following levels:*
ESD Immunity (IEC61000-4-2)	• 4 kV contact, 8 kV air, 4 kV indirect
Radiated Immunity (IEC61000-4-3)	• 10 V/m, 80…1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier
Fast Transient Burst (IEC61000-4-4)	• 2 kV, 5 kHz
Surge Immunity (IEC61000-4-5)	• 2 kV galvanic gun
Conducted Immunity (IEC61000-4-6)	• 10V, 0.15…80 MHz[2]

[1]   For operation above 2000 meters, consult the factory.

[2]   Conducted Immunity frequency range may be 150 kHz to 30 MHz if the Radiated Immunity frequency range is 30 MHz to 1000 MHz.

Electrical and DeviceNet Specifications

Specification	Value
Bus Current Draw, Max.	440 mA @ 5V dc (2.2 W)
DeviceNet Power Requirements	N.E.C. Class 2 90 mA @ 11V dc, max. 110 mA @ 25V dc, max. 200 mA for 1.5 ms, inrush
Heat Dissipation, Max.	3.8 W (assumes typical DeviceNet network traffic)
Baud Rates	125 K bits/s (default) 250 K bits/s 500 K bits/s
Maximum Cable Length	500 m @ 125 K baud 100 m @ 500 K baud
DeviceNet Cable	Allen-Bradley catalog number 1485C-P1-Cxxx.
Power Supply Distance Rating	4 (The module may not be more than 4 modules away from the power supply).
DeviceNet to Compact Bus Isolation	Verified by one of the following dielectric tests: 500V ac for 1 minute or 707V dc for 1 minute. 30V dc working voltage (IEC Class 2 reinforced insulation)
Vendor I.D. code	1
Product Type Code	12
Product Code	105

Dimension Drawings

Compact I/O with CompactLogix Controller and Power Supply

NOTE: All dimensions are in mm (inches). Hole spacing tolerance: ±0.4 mm (0.016 in.).

Compact I/O with CompactLogix Controller and Power Supply
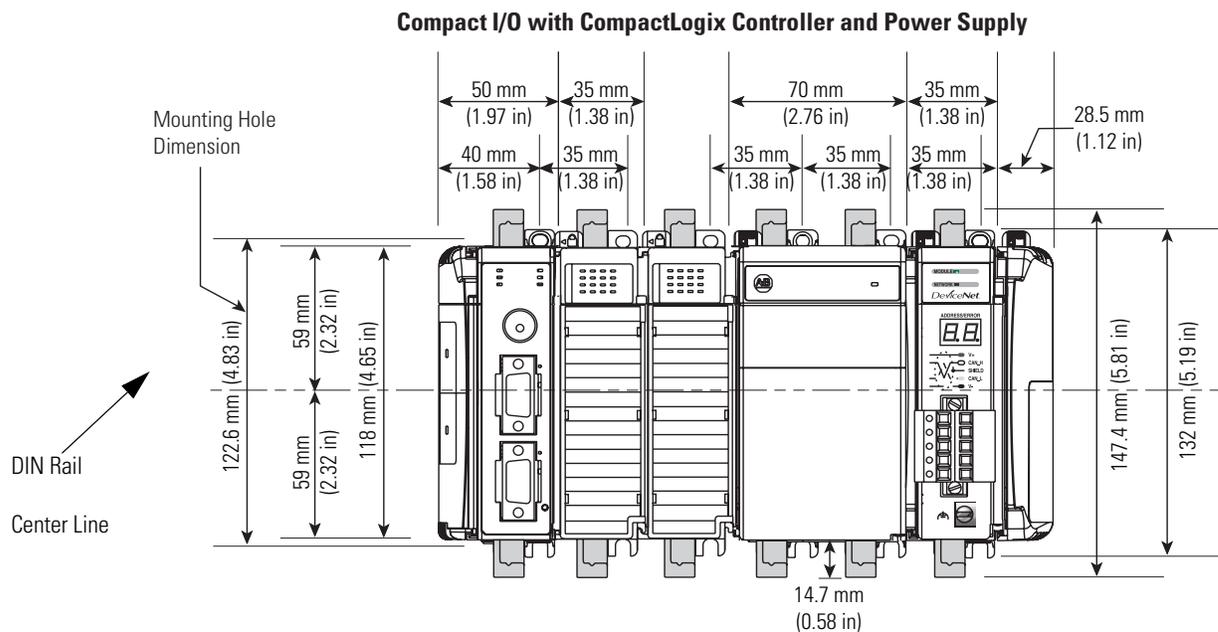
Compact I/O with MicroLogix 1500 Base Unit and Processor

NOTE: All dimensions are in mm (inches). Hole spacing tolerance: ±0.4 mm (0.016 in.).

Compact I/O with MicroLogix 1500 Base Unit and Processor
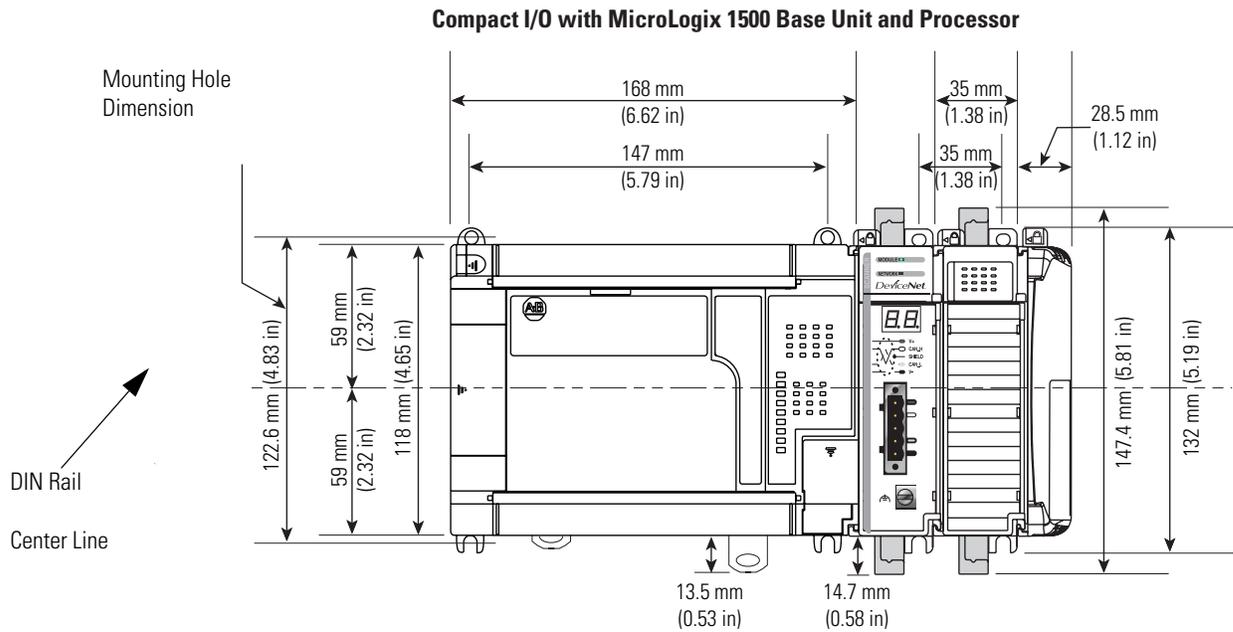
1769-SDN DeviceNet Class Codes

This appendix contains the most commonly used class codes for the 1769-SDN DeviceNet Scanner Module. They are shown in the following tables.

Table B.1 DeviceNet Object

Name	Class	Instance	Attribute	Data Size	Access
MAC ID	0x03	0x01	0x01	1 byte	Get/Set[1]
Baud Rate	0x03	0x01	0x02	1 byte	Get/Set
Bus Off Counter	0x03	0x01	0x04	1 byte	Get

[1] The set also causes a reset.

Table B.2 Identity Object

Name	Class	Instance	Attribute	Data Size	Access
Vendor ID	0x01	0x01	0x01	2 bytes	Get
Device Type	0x01	0x01	0x02	2 bytes	Get
Product Code	0x01	0x01	0x03	2 bytes	Get
Revision	0x01	0x01	0x04	2 bytes	Get
Status	0x01	0x01	0x05	2 bytes	Get
Serial Number	0x01	0x01	0x06	4 bytes	Get
Product Name	0x01	0x01	0x07	9 bytes	Get

Notes:

This term	Means
Auto-Address Recovery (AAR)	Auto-Address Recovery (AAR) allows a slave device to be removed from the network and replaced with another identical slave device that is residing on the network at Node Address 63 and not in the Scanners Scan List. The replacement device will have its Node Address automatically changed to that of the device being replaced. Depending on the level of revision keying, it may be possible for the Node Address of the replacement device to be changed but not brought on-line due to a revision-keying mismatch.
Auto Device Replacement (ADR)	The Auto Device Replacement feature automates the replacement of a failed slave device on a DeviceNet network by configuring the new device to the prior level of operation. This includes Configuration Recovery (CR) and Auto-Address Recovery (AAR).
Bridge	The scanner module's support of explicit message transfer.
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 whenever a data change occurs or, at the predefined heartbeat interval.
Configuration Recovery (CR)	Configuration Recovery (CR) allows a slave device to be removed from the network and replaced with an identical slave device configured at the same baud rate and Node Address as the device being replaced.
Controller	The programmable controller, for example CompactLogix or MicroLogix 1500.
Cyclic	A type of I/O data communication. The scanner module 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 module 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).
Explicit Messaging	A type of messaging used for lower priority tasks, such as configuration and data monitoring.
Heartbeat Rate	Devices that are configured for change of state data will send data at this rate if no data change occurs.
Host Platform	The computer on which the application software is run.
I/O	An abbreviation for input and output.
Input Data	Data produced by a DeviceNet device and collected by the scanner module for the host platform to read.

This term	Means
MAC ID	The network address of a DeviceNet node. Also referred to as node address.
Multicast	Used when describing a strobe message.
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 a device.
Offline	When the host platform is not communicating on the network.
Online	When the host platform is configured and enabled to communicate on the network.
Output Data	Data produced by the host platform that is written to the scanner module's memory. This data is sent by the scanner module to DeviceNet devices.
PC	Abbreviation for an IBM compatible personal-computer.
Point-to-Point	Used when describing a poll message. The message solicits a response from a single, specified device on the network.
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 module'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 1769-SDN module to support the exchange of I/O with slave modules.
Slave Mode	The 1769-SDN module is in slave mode when it is placed in another DeviceNet master's scanlist as a slave device.
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.

Notes:

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| Cat. No. | 1769-SDN | Pub. No. | 1769-UM009C-EN-P | Pub. Date | May 2005 | Part No. |

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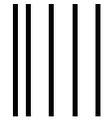
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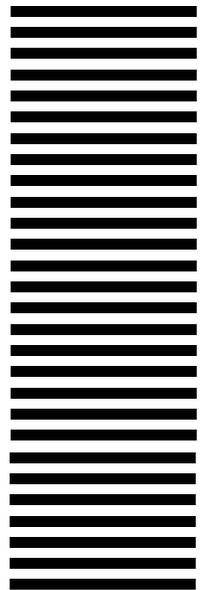
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