**Allen-Bradley**

*DeviceNet
Starter Kit*

(Cat. No. 1787-STARTKIT1)
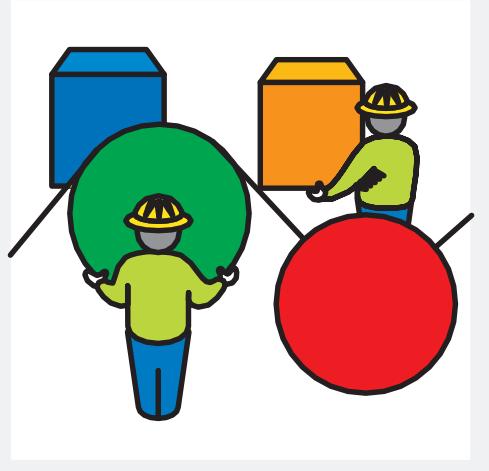
User Manual

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) 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 the Allen-Bradley Company 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, the Allen-Bradley Company cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Allen-Bradley Company 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.

> ⚠ **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 the hazard
- recognize the consequences

Important: Identifies information that is especially important for successful application and understanding of the product.

Table of Contents

Before You Begin

What this Chapter Contains

This chapter describes what you must know and do before you begin to use your starter kit. The following table describes what this chapter contains and its location.

What Is DeviceNet?

DeviceNet is a low-end, open network providing connections between simple, primarily discrete industrial devices and controllers without the need for intervening I/O modules or blocks. Simple devices include products such as sensors and actuators.

The intent of this network is to provide an alternate way for control engineers to connect simple devices to their control systems. The DeviceNet network:

- supports devices that are becoming more intelligent
- facilitates increasingly precise troubleshooting to reduce down-time (a communication fault can be traced to a single device rather than to the rack or block level as with an I/O network)
- reduces installation and startup costs and time (compared to traditional I/O wiring, especially when devices are spread over several hundred feet)

What Hardware and Software You Need for Your Starter Kit

The following table lists what materials you need to follow the procedures described in this manual. Notice which products are supplied in the DeviceNet starter kit and which you must provide.

Product	Quantity	Part number
Provided in the Starter Kit 1		
T-port tap (right keyway)	5	1485P-P1N5-MN5R1
mini-male to conductor 1m drop cable	4	1485R-P1M5-C
mini-male to micro female 1m drop cable	4	1485R-P1M5-R5
terminator, female	2	1485A-T1N5
3-receptacle 5-wire terminal block	1	1492-DNTB3
DeviceLink I/O mini-male to mini female	1	1485D-A1M5-R4
limit switch, mini-male	1	802T-APJ1
Series 9000 Diffuse Photoelectric sensor	1	42GNP-9000-QD
800T RediSTATION	1	2705-T3DN1A42A
this user manual	1	DN-6.91
Feedback Disk with DeviceNet survey	1	CSV-683
What You Must Provide		
24 volt, DC power supply (<3amp output)	1	n/a
wires for power supply (18 gauge recommended)	3	n/a
SLC® chassis	1	1746-A4, -A7, -A10, -A13
SLC 5/02®, 5/03®, or 5/04® processor	1	1747-L524, -L532, -L542
SLC DeviceNet scanner[1]	1	1747-SDN
SLC chassis power supply	1	1746-P1, -P2, -P3, -P4
SLC programming software[2]	1	APS or AI5
IBM® compatible PC	1	n/a
Microsoft® Windows™ (3.1 or later), Windows NT™ or Window '95™ software	1	n/a
DeviceNetManager™ software[1]	1	1787-MGR
RS-232 interface module[1]	1	1770-KFD
PC-to-SLC programming connection[3]	1	n/a[3]

[1] This product is included with DeviceNet Starter Kit 2 or 3.
[2] APS software is used in this manual's examples.
[3] Due to the varied possibilities, the components for your PC-to-processor communication link do not appear in the table above or the following illustrations. Your existing PC-to-processor connection is compatible with this document's procedures and configurations.

Important: You can use this starter kit with a PLC® chassis, processor and 1771-SDN scanner module. Differences are based on PLC technology (scanner mapping and PLC programming). These variations are described where applicable in this user manual.

You can use this starter kit with any DeviceNet master. Refer to your user documentation for more information.

What We Assume You Know and Have Done

The descriptions in this user manual assume that you know how to install and use all of the hardware and software that you must provide (listed above). We also assume you have these items installed and ready.

If you do not, read the documentation associated with these items and have them installed and ready to use before you attempt to assemble your starter kit.

Tool You Must Provide

To connect the wiring in this starter kit, you'll need a small, flat-blade screwdriver.

Identify the Starter Kit Components

Unpack your starter kit and use the following illustration to identify all of the components you should have received. Contact your local Allen-Bradley representative if any item is missing.

T-port tap (5)

Mini-male to conductor, 1m drop (2)

Mini-male to micro-female (1)

3-receptacle 5-wire terminal block (1)

DeviceLink I/O mini-male to mini-female (1)

Female terminator (2)

Limit switch mini-male (1)

This user manual (1)

Series 9000 Photoelectric sensor micro-male (1)

800T RediSTATION with mini-male connector (1)

floppy disk with survey (1)
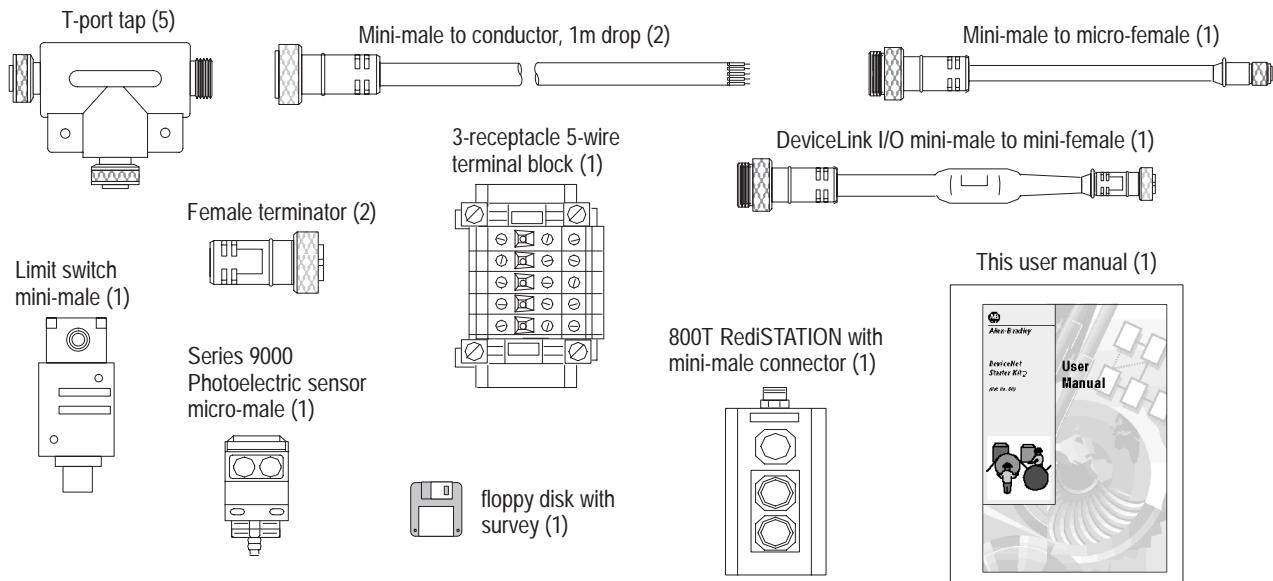
Identify the Components You Must Provide

Use the following illustration to identify all of the hardware and software you must provide.

1747-SDN DeviceNet Scanner Module*

SLC 5/02, 5/03 or 5/04 Processor

24 Volt, DC power supply with three wires (18-gauge recommended)

Power Supply

5-pin linear plug with probe holes and jack screws (included with 1747-SDN Scanner Module)*

SLC chassis

1770-KFD Interface Module*

DeviceNetManager Software*

SLC Programming Software*
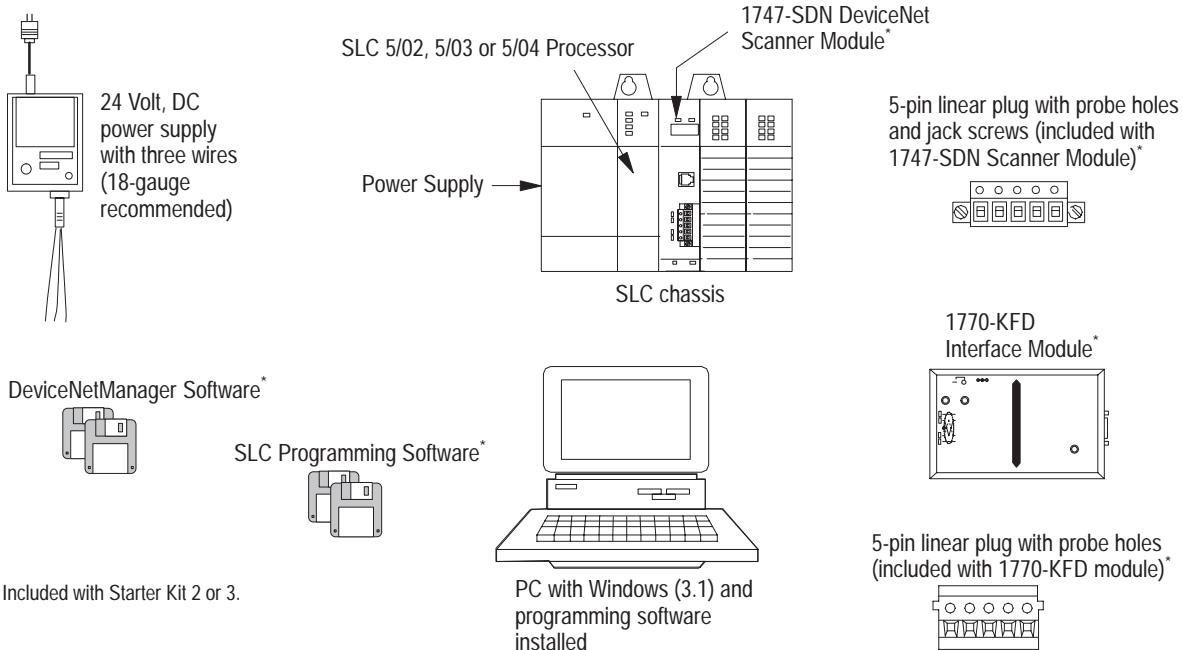
* Included with Starter Kit 2 or 3.

PC with Windows (3.1) and programming software installed

5-pin linear plug with probe holes (included with 1770-KFD module)*

What You Will Be Doing in this Manual

The following chapters describe how to setup up a simple DeviceNet network and perform basic operations:
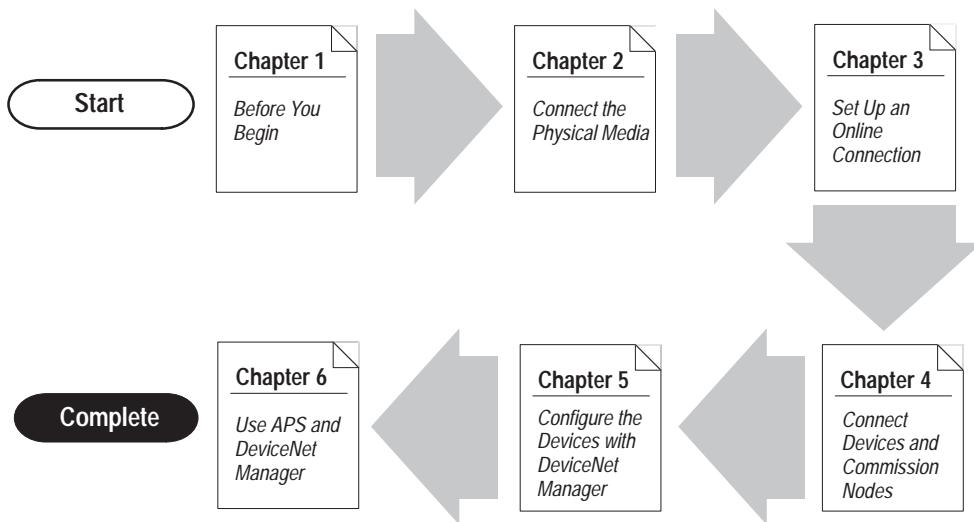
Complete the Starter Kit Feedback Disk

Your starter kit contains a Feedback Disk with a Windows-based survey. This survey is designed to get your comments on the starter kit, the DeviceNet network and Allen-Bradley products and services. We will use your input for future product and service development.

Please complete the survey by answering all the questions, enclosing the disk in the self-addressed stamped envelope and mailing it. Allen-Bradley guarantees complete confidentiality of all information on the survey disk.

Rely on A-B Quality and DeviceNet Support

We have helped numerous customers around the world achieve their manufacturing goals. For assistance with A-B DeviceNet products, call your local distributor or sales office.

Our support network offers complete system integration and support services including application engineering, installation supervision, system startup, training, field service, and ongoing product support.

 We're global because we're local to you.

You can access an A-B sales representative, appointed distributor, or authorized system integrator almost anywhere around the world. Perhaps that's why A-B is the preferred supplier of automation controls in the industry.

Related Publications

Title	Publication Number
DeviceNet Product Overview	DN-2.5
DeviceNet Sealed Physical Media Bulletin 1485 Product Profile	DN-1.8
DeviceNet Media System Vendor List	DN-2.1
PHOTOSWITCH™ Series 9000 Photoelectric Sensors for the DeviceNet Network Product Profile	DN-1.11
DeviceNet RediSTATION Product Profile	DN-1.13
DeviceNet Communication Link Overview Product Profile	DN-1.18
DeviceLink I/O Product Profile	DN-1.15
DeviceNet Scanner for 1771 Chassis Product Profile	DN-1.7
Open DeviceNet Vendor Association Catalog	CSV-654
Open Device Network Offers Improved Communications and Flexibility Product Profile	DN-1.9

Summary and What's Next

In this chapter, you learned:

- about the DeviceNet network
- what you need to use this starter kit
- what we assume you know and have done
- to identify the starter kit components
- to identify the components you must provide
- what you will be doing in this manual
- how to complete the starter kit survey diskette
- about Allen-Bradley quality and DeviceNet support

Move on to Chapter 2 to learn how to connect the physical media.

Connect the Physical Media

What this Chapter Contains

The following table describes what this chapter contains and its location.

For information about:	See page
what the network will look like	2–1
connecting the trunk line	2–2
connecting the drop lines	2–3
chapter summary and what's next	2–4

Illustrated Objective

Use the illustration below to see how your DeviceNet network will look after following this chapter's procedures.
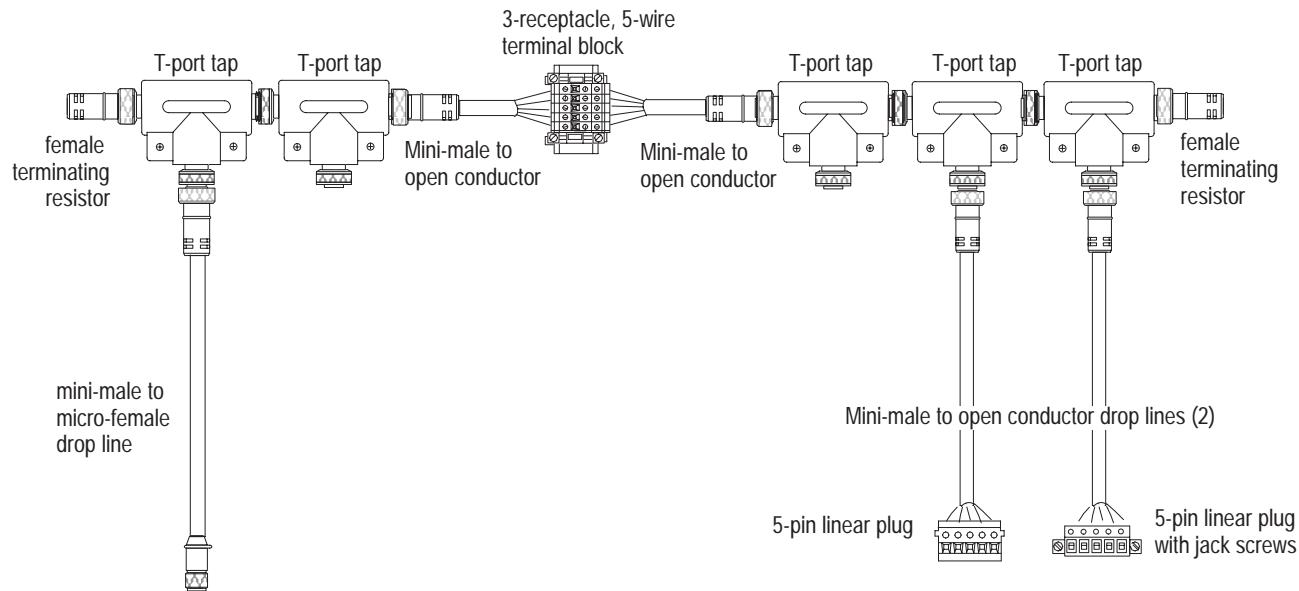
Connect the Trunk Line

Gather the following components from your starter kit:

Female terminators (2)

T-port taps (5)

Mini-male to open conductors (2)

3-receptacle 5-wire terminal block (1)
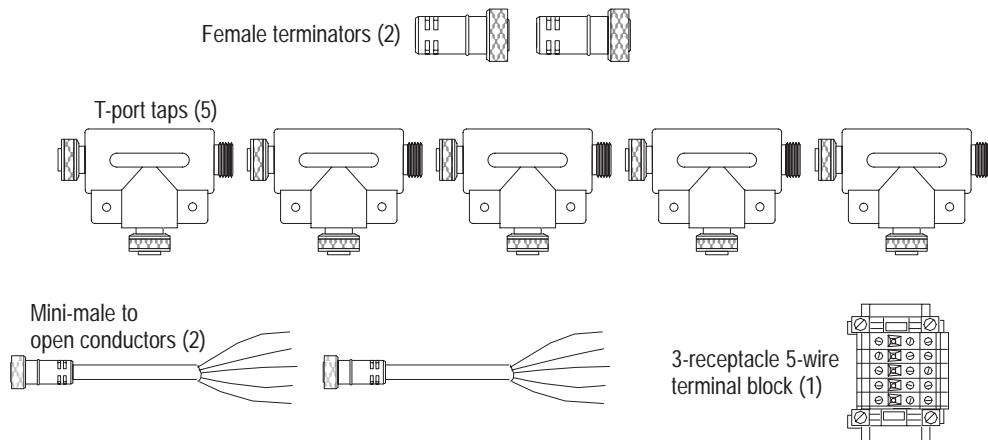
Use the following illustration as a guide to connect the trunk line:

Basic steps

1. Insert and hand-tighten the T-port taps to each other in groups of two and three.

2. Connect colored wiring on open conductors to matching terminals on the terminal block.

3. Attach terminators to each end of the row of T-port taps.

Important When terminating a DeviceNet system, do not put a terminating resistor on a node. Doing so risks network failure if you remove the node. The resistor must be at the end of the trunk line.

How to wire the terminal block:

2nd terminal strip and receptacle (center and rear)

RED
WHITE
DRAIN
BLUE
BLACK

RED
WHITE
DRAIN
BLUE
BLACK

1st terminal strip and receptacle (left)

terminal block

female terminating resistor

T-port tap

T-port tap

Mini-male to open conductor

Mini-male to open conductor

Connect this T-port tap to this mini-male connector

T-port tap

T-port tap

T-port tap

female terminating resistor

Connect the Drop Lines

To connect the drop lines, gather the following components:

Included with your starter kit

mini-male to micro-female drop line

Mini-male to open conductor drop lines (2)

Included with your 1770-KFD module

5-pin linear plug

Included with your 1747-SDN module

5-pin linear plug with jack screws
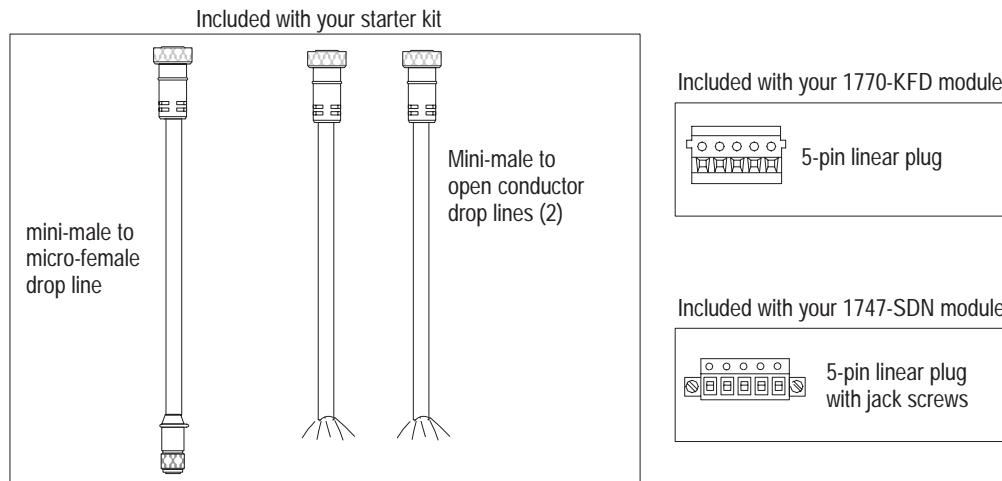
Use the following illustration as a guide to attach the drop lines to the trunk line:

T-port tap　　T-port tap　　terminal block　　T-port tap　　T-port tap　　T-port tap

female terminating resistor

Mini-male to open conductor

Mini-male to open conductor

female terminating resistor

mini-male to micro-female drop line

Mini-male to open conductor drop lines (2)

5-pin linear plug

5-pin linear plug with jack screws

How to wire the 5-pin linear plugs:

BLACK → ← WHITE
BLUE → ← RED
DRAIN →

RED →
← BLUE
WHITE →
← BLACK
DRAIN →

Basic steps

1. Insert and hand-tighten each conductor of a mini-male-to-conductor drop line into the appropriate T-port tap.

2. Wire the 5-pin linear plug according to the illustration on the right. Make sure the wiring color sequence matches the color sequence on the label of the 1770-KFD module.

3. Wire the 5-pin linear plug with jack screws according to the illustration on the right. Make sure the wiring color sequence matches the color sequence on the label of the 1747-SDN module.
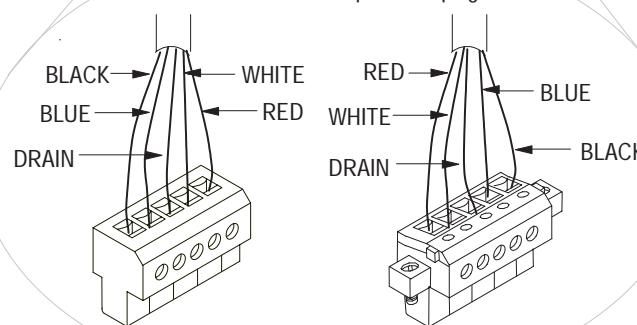
Summary and What's Next

In this chapter, you learned how to:

- understand what the network will look like
- connect the trunk line components
- connect the drop lines

Move on to Chapter 3 to learn how to set up an online connection.

Set Up an Online Connection

What this Chapter Contains

The following table describes what this chapter contains and its location.

Illustrated Objective

Use the illustration below to see how your DeviceNet network will look after following this chapter's procedures.

Connect the 1770-KFD and Personal Computer

To connect the 1770-KFD interface module:

1. Use the RS-232 cable to connect the 1770-KFD module to your computer's serial port.

Drop
line

1770-KFD
interface module

RS-232 Cable
to your computer

RS-232
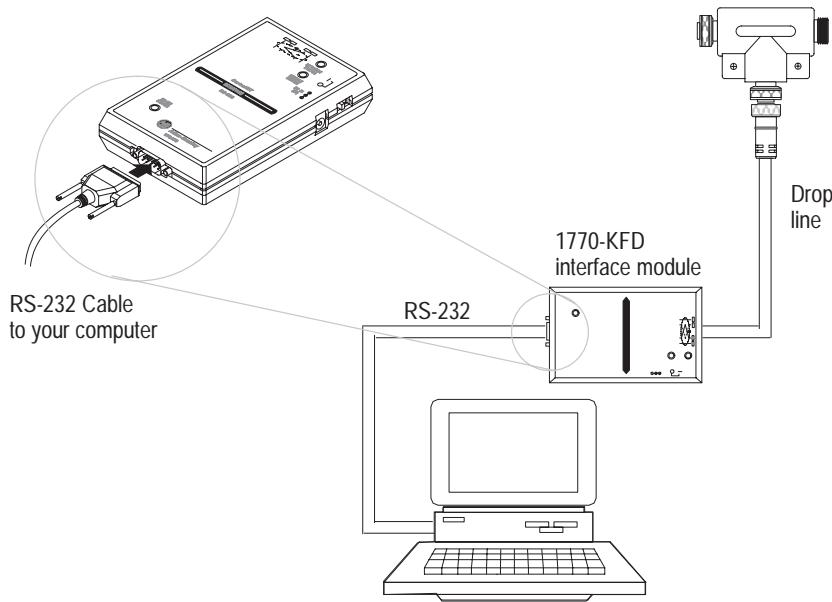
2. Use one of the 5-pin linear plugs (attached to the mini-male to open conductor) to connect the 1770-KFD module to the trunk line.

RS-232 Cable

Mini-male to open
conductor with 5-pin
linear plug attached

1770-KFD
interface module

Drop
line

Mini-male to
open conductor with 5-pin linear
plug attached.

Be sure the wiring orientation on
the plug matches the wiring color
scheme on the 1770-KFD
module.
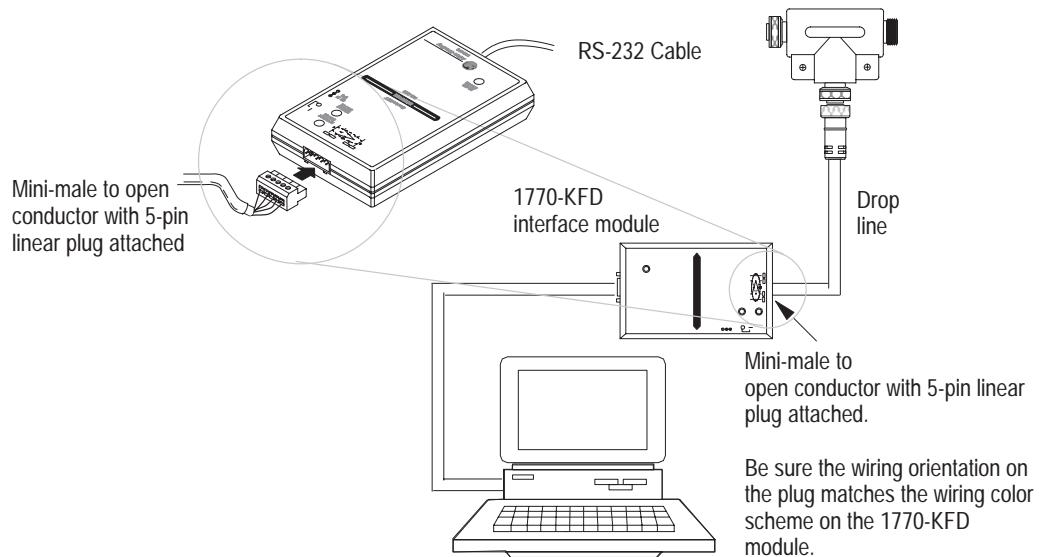
Connect the 1747-SDN Scanner Module

For installation information on the 1771-SDN scanner module, refer to the *Installation Instructions,* publication 1771-5.14.

To connect the scanner module:

1. Be sure that the SLC chassis power is off.

> ⚠ **ATTENTION:** Do not wire the 1747-SDN Scanner Module with the network power supply on. Wiring the module with the network power supply on may short your network or disrupt communication.

2. Connect the 1747-SDN Scanner Module to the 5-pin linear plug (attached to the mini-male open conductor) as shown in the area of detail below:

Drop line

SLC chassis

Chassis Power Supply

1747-SDN DeviceNet Scanner Module

SLC 5/02, -5/03 or -5/04 Processor

Mini-male to open conductor with 5-pin linear plug with jack screws.

Be sure the wiring orientation on the plug matches the wiring color scheme on the 1747-SDN Scanner Module module.

DeviceNet port
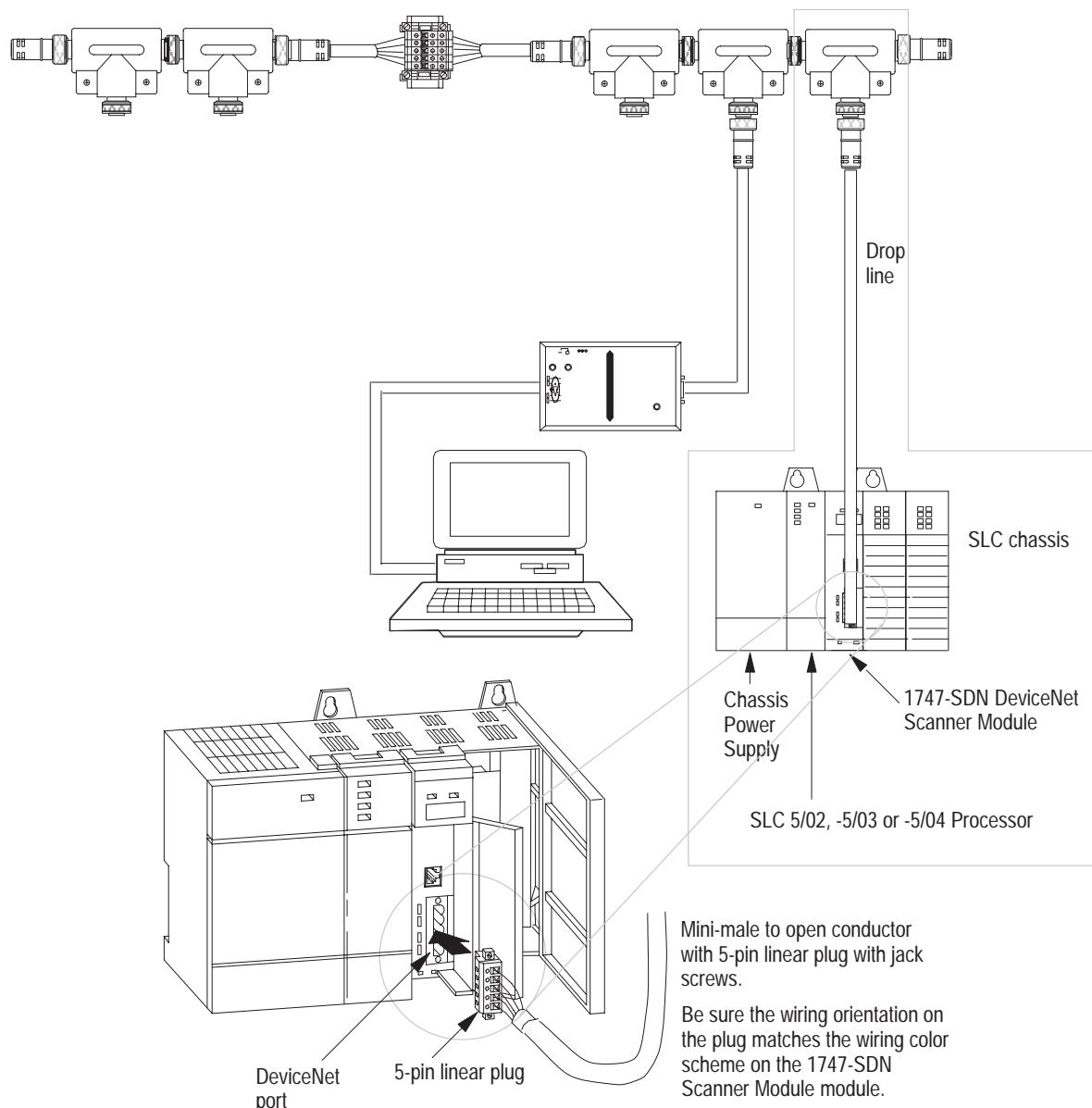
5-pin linear plug

3. Tighten the jack screws on the 5-pin linear plug.

Connect the Power Supply

Connect the 24Vdc power supply to the terminal block as shown in the area of detail below:

> ⚠️ **ATTENTION:** The cabling in the DeviceNet starter kit is rated at 3 amps. Be sure your power supply output current does not exceed 3 amps.

RED (24Vdc)

DRAIN (GND)

BLACK (0Vdc)

To power source

24Vdc power supply

3rd terminal strip and receptacle (right and front)

Ground the Network

schematic

signal
signal
drain
V–
V+

V–　　V+
class 2 power supply

L1
L2
grd

120V ac
(typical)
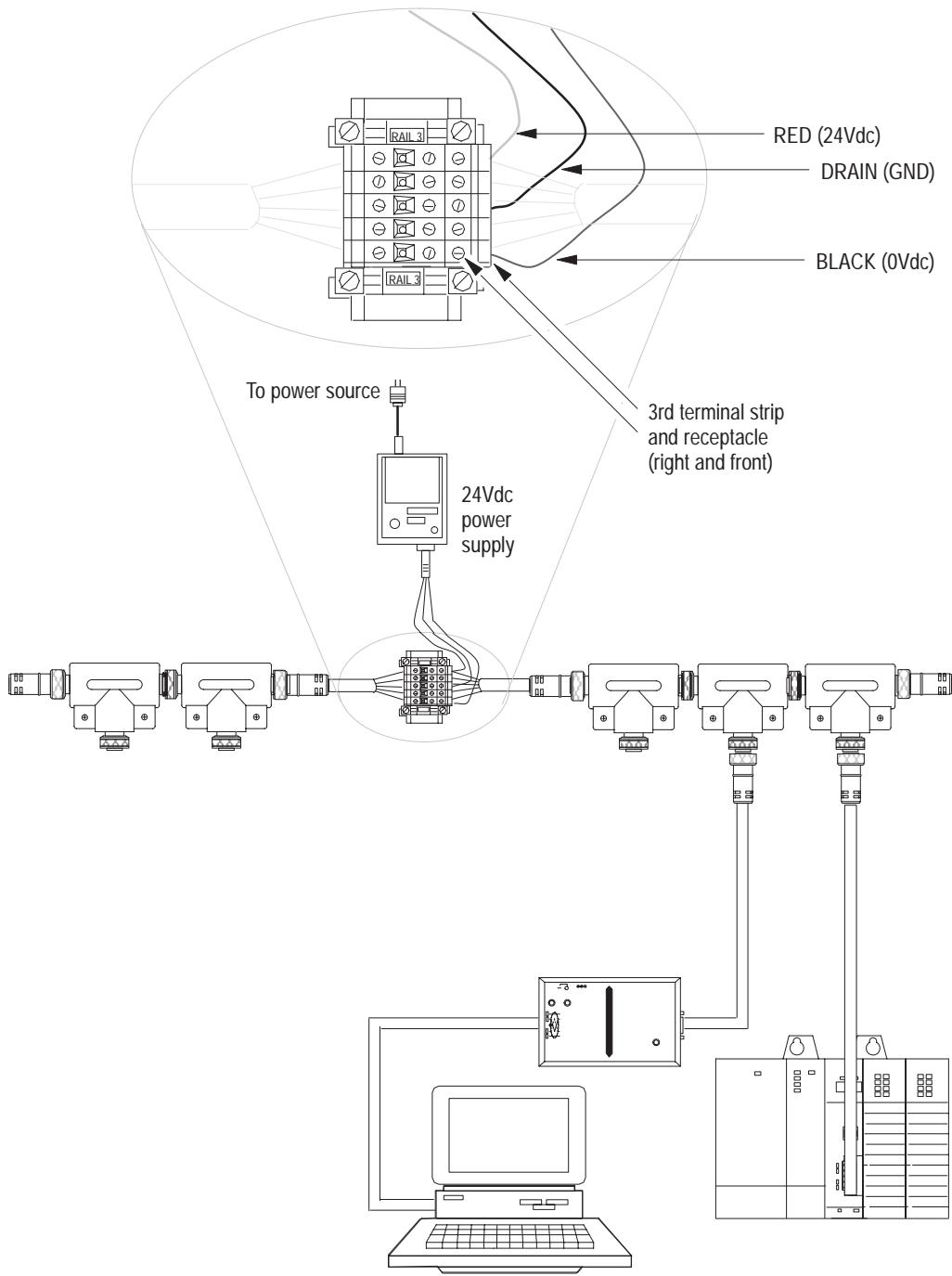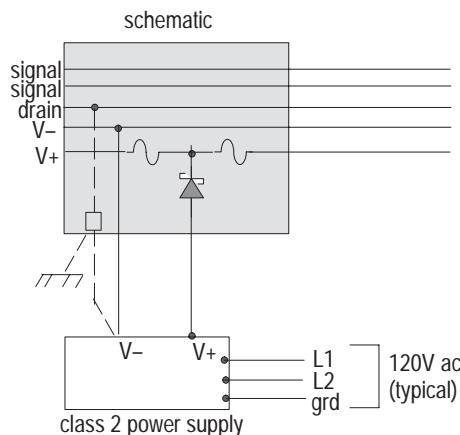
You must ground your DeviceNet network at only one location.

To ground the network:

- Connect the network shield and drain wire to an earth or building ground using a 0.25mm (1in) copper braid or a #8 AWG wire up to 3m (10ft) maximum in length

- Use the same ground for the V– conductor of the cable system and the dc ground of the power supply.

Apply System Power

Apply power to the devices you just installed in your DeviceNet system:

- 24V dc power supply
- 1770-KFD interface module
- personal computer
- SLC chassis with power supply and scanner module installed

24Vdc power supply

1770-KFD interface module

Personal Computer

Power Supply

1747-SDN DeviceNet Scanner Module

SLC 5/02, 5/03 or 5/04 Processor
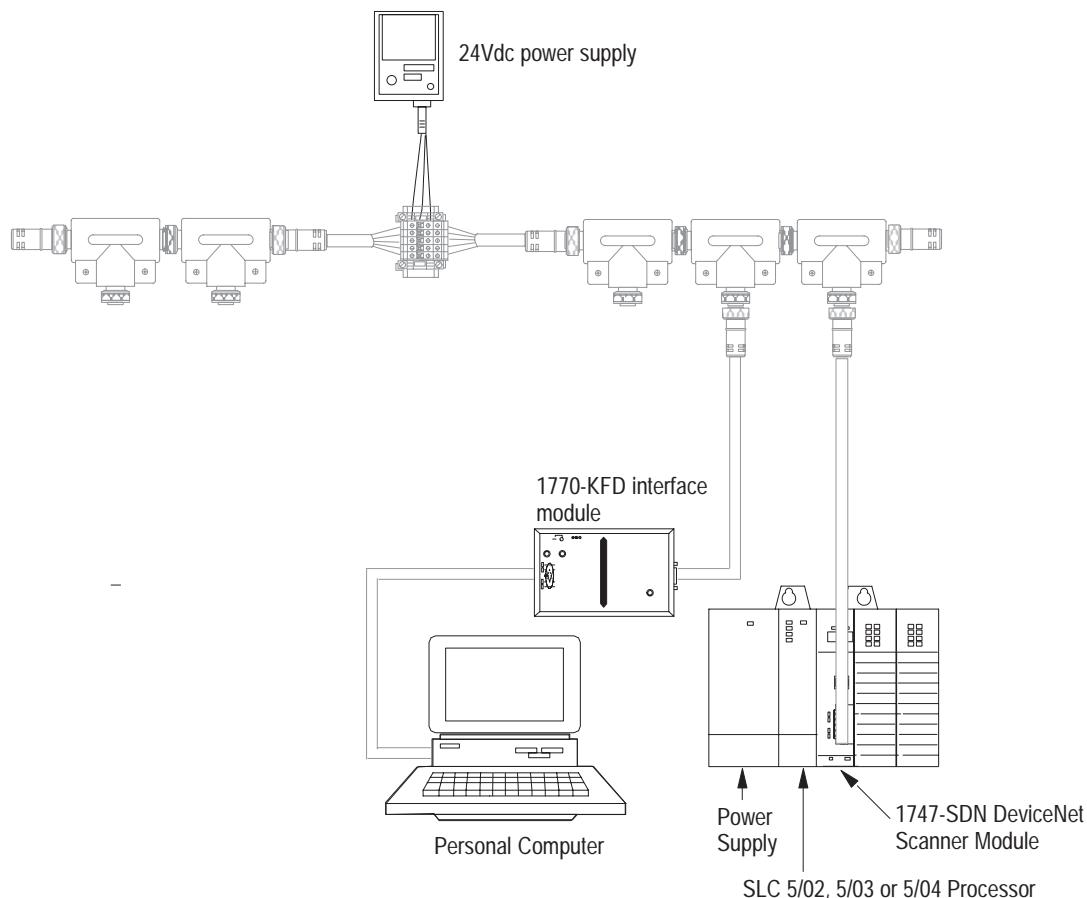
Check Scanner Module Diagnostics

Observe the diagnostics on the scanner module:

- the node address and status display should be alternately flashing between 00 and 75
- the module status indicator should illuminate solid green
- the network status should be flashing green

Top part of module
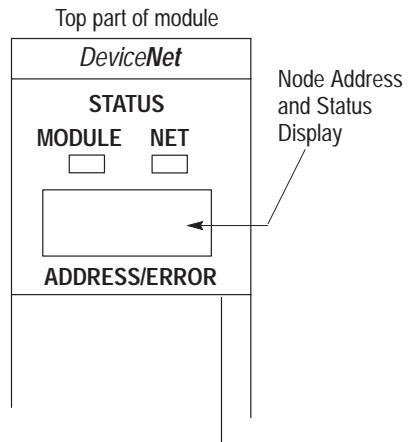
Set Up an On-line Connection

For installation information on DeviceNetManager Software, refer to the *DeviceNetManager User Manual*, publication 1787-6.5.3.

Follow these steps to go on line:

1. Start DeviceNetManager software.

2. From the *Utilities* menu, choose **Set Up Online Connection**.

You see this screen:

Network Interface Setup

Current Network Setup

Node Name
None

Node Address
62

Data Rate
125 kbps

Description
No Network Info Available: Currently setup for a direct connection

Interface Adapter

Selected Driver: Allen-Bradley 1770-KFD Module
Serial Port: COM1
Baud Rate: 19.2 k

Go Online
Cancel
Help
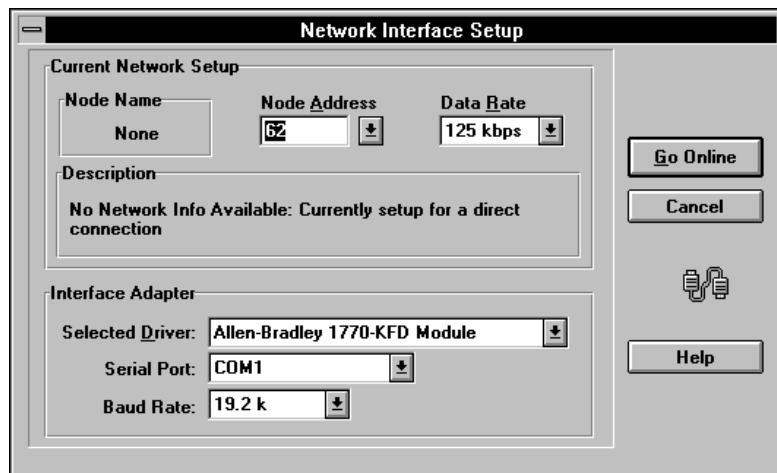
The node address for the 1770-KFD module should be 62.

Is the Node Address for your 1770-KFD 62?	Choose
Yes	**Go Online**
No	the new address by scrolling to 62 in the **Node Address** dialog box:

Current Network Setup

Node Name
None

Node Address
61
58
59
60
61
62
63

Data Rate
125 kbps

Description
No Network Info Availab
connection
setup for a direct

Interface Adapter

Selected Driver: Allen-Bradley 1770-KFD Module
Serial Port: COM1
Baud Rate: 19.2 k
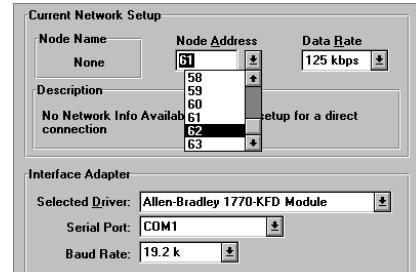
and then:

Go Online

You see this screen:

Interface Setup - Data Rate Warning

⚠ **ONLINE CONNECTION WARNING!**

You are attempting to go online at :   125 k

Connecting to the network at the wrong data rate may cause some or all of the devices on the network to fail.

ARE YOU SURE?

Yes - Go Online   No - Do Not Go Online

☐ Disable this Warning
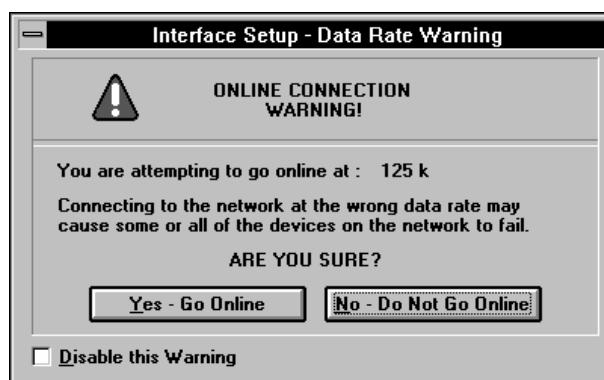
3. Choose Yes - Go Online

You see this status bar at the bottom of the **Program Manager** screen:

| Ready | OnLine | KFD-COM1-19200 | Addr 62 | 125 k |

The status bar indicates you are online.

For troubleshooting information on DeviceNetManager Software, refer to the *DeviceNetManager User Manual*, publication 1787-6.5.3.

If you see this screen:

DeviceNet Manager

⊗ **Failure: Could not go on-line.**

OK

check your network connections and repeat the **Set Up Online Connection** procedure.

Perform a Network Who

Perform a **Network Who** to verify that the 1747-SDN Scanner Module and DeviceNetManager software are on the network.

1. From the *Who* menu, select **Network Who.**

You see this screen:
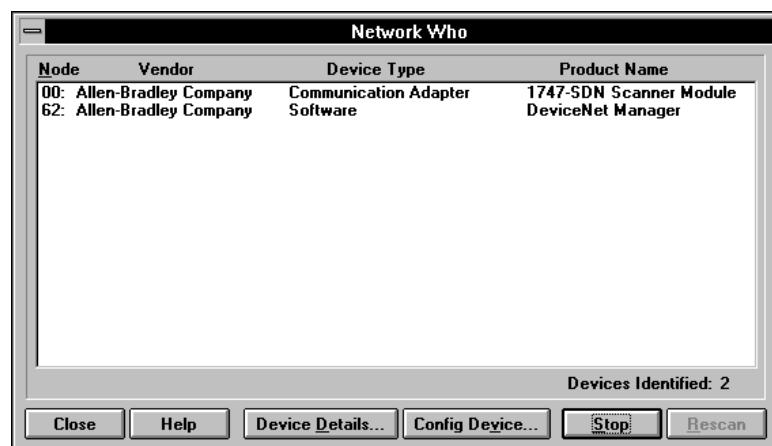
2. After the 1747-SDN Scanner Module and DeviceNetManager software devices appear on the network, click on

If one or both of the devices do not appear, check their connections and repeat the **Network Who** procedure.

Summary and What's Next

In this chapter, you learned how to:

- connect the 1770-KFD and your personal computer
- connect the 1747-SDN scanner module
- connect the power supply
- ground the network
- apply system power
- set up an on-line connection
- perform a **Network Who**
- chapter summary and what's next

Move on to Chapter 4 to learn how to connect the devices.

Connect the Devices and Perform Node Commissioning

What this Chapter Contains

The following table describes what this chapter contains and its location.

For information about:	See page
what the network will look like	4–1
configuring the 800T RediSTATION operator interface	4–2
connecting the 800T RediSTATION operator interface	4–3
connecting the Series 9000 photoelectric sensor and performing node commissioning	4–5
connecting the DeviceLink I/O and limit switch and performing node commissioning	4–9
chapter summary and what's next	4–13

Illustrated Objective

Use the illustration below to see how your DeviceNet network will look after following this chapter's procedures.

Drop line

DeviceLink I/O

800T RediSTATION operator interface with mini-male connector

Series 9000 Photoelectric sensor micro-male

Limit switch mini-male

Configure the 800T RediSTATION Operator Interface

baud   output
rate flash rate

node address   output fault state

6 Cover Screws

DIP Switches

5-pin linear plug

Cover

LED

DeviceNet
Connector
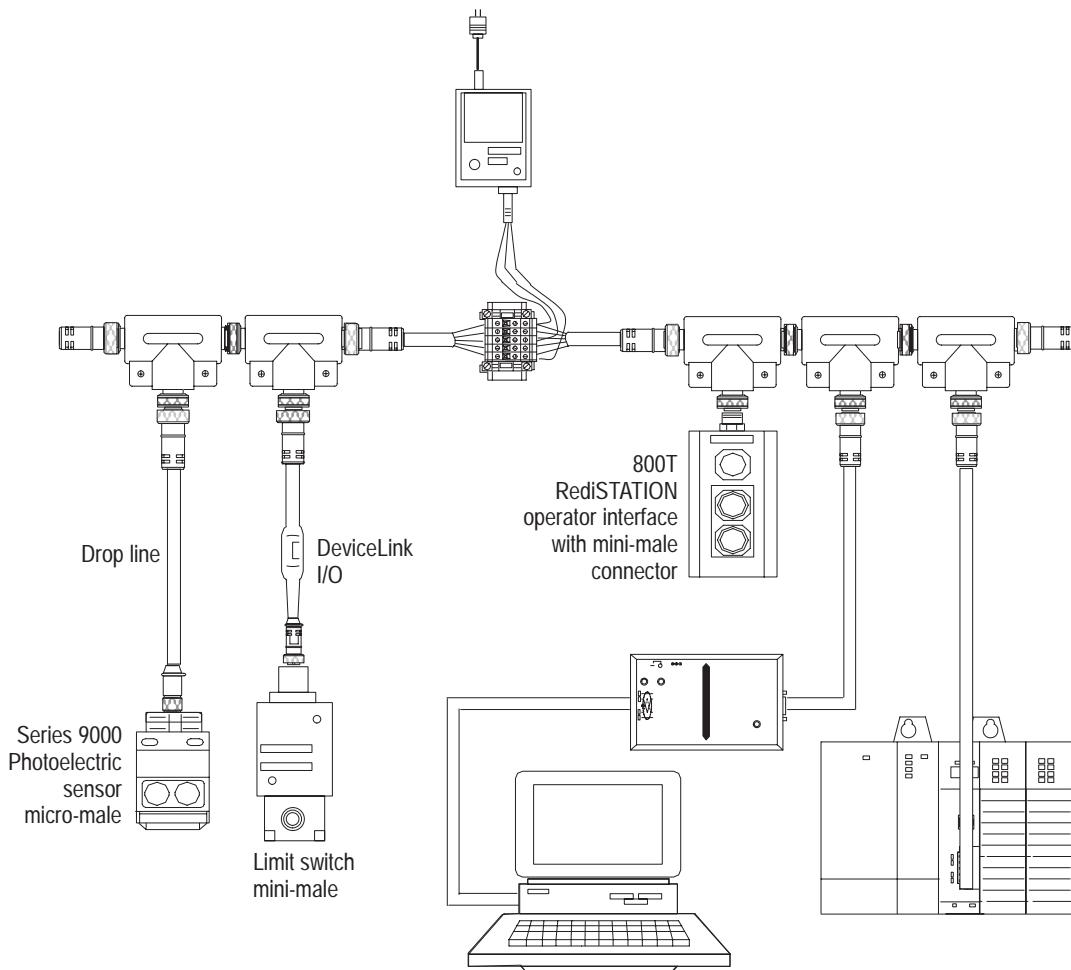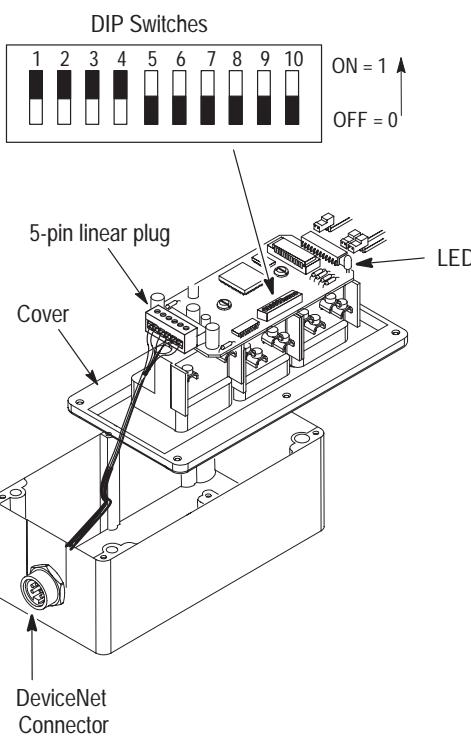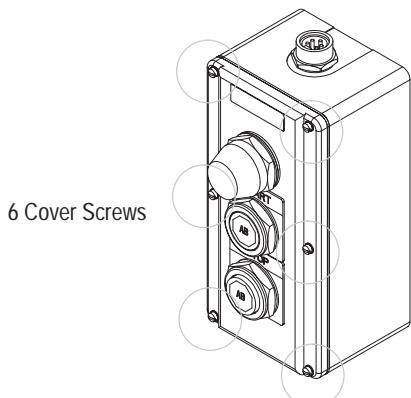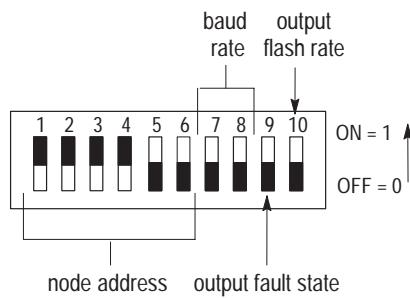
You must configure the RediSTATION operator interface's DIP switches before it can go online. This configuration is its commissioning. The RediSTATION operator interface is not commissioned through the software. Switch-configured values include:

- node address
- baud rate
- output fault-state
- output flash-rate

To configure your RediSTATION operator interface:

1. Remove the RediSTATION operator interface's enclosure cover:

    A. Using a slotted screwdriver, remove the six cover screws.

    B. Carefully remove the cover so as not to disconnect any wires.

    C. To easily access the DIP switches, disconnect the 5-pin linear plug from the circuit board.

2. Set the DIP switches to match the illustration below.

> ⚠️ **ATTENTION:** Do not use a pencil to set the RediSTATION operator interface's DIP switches. Graphite from the pencil is conductive and may damage the switch.

In this manual's example, these dip switch settings indicate that:

- the node address is **15**
- the baud rate is **125 Kb**
- the output fault-state is **off**
- the output flash rate is **1 hz** (0.5 seconds on and 0.5 seconds off)

3. Re-attach the 5-pin linear plug to the circuit board.

4. Use the six cover screws to re-attach the enclosure to the station's cover.

For more detailed information about setting DIP switches, refer to the RediSTATION Operator Interface User Manual.

Connect the 800T RediSTATION Operator Interface

Connect the 800T RediSTATION operator interface to the mini-female end of the T-port connector as shown in the area of detail below:

800T
RediSTATION
operator interface
with mini-male
connector
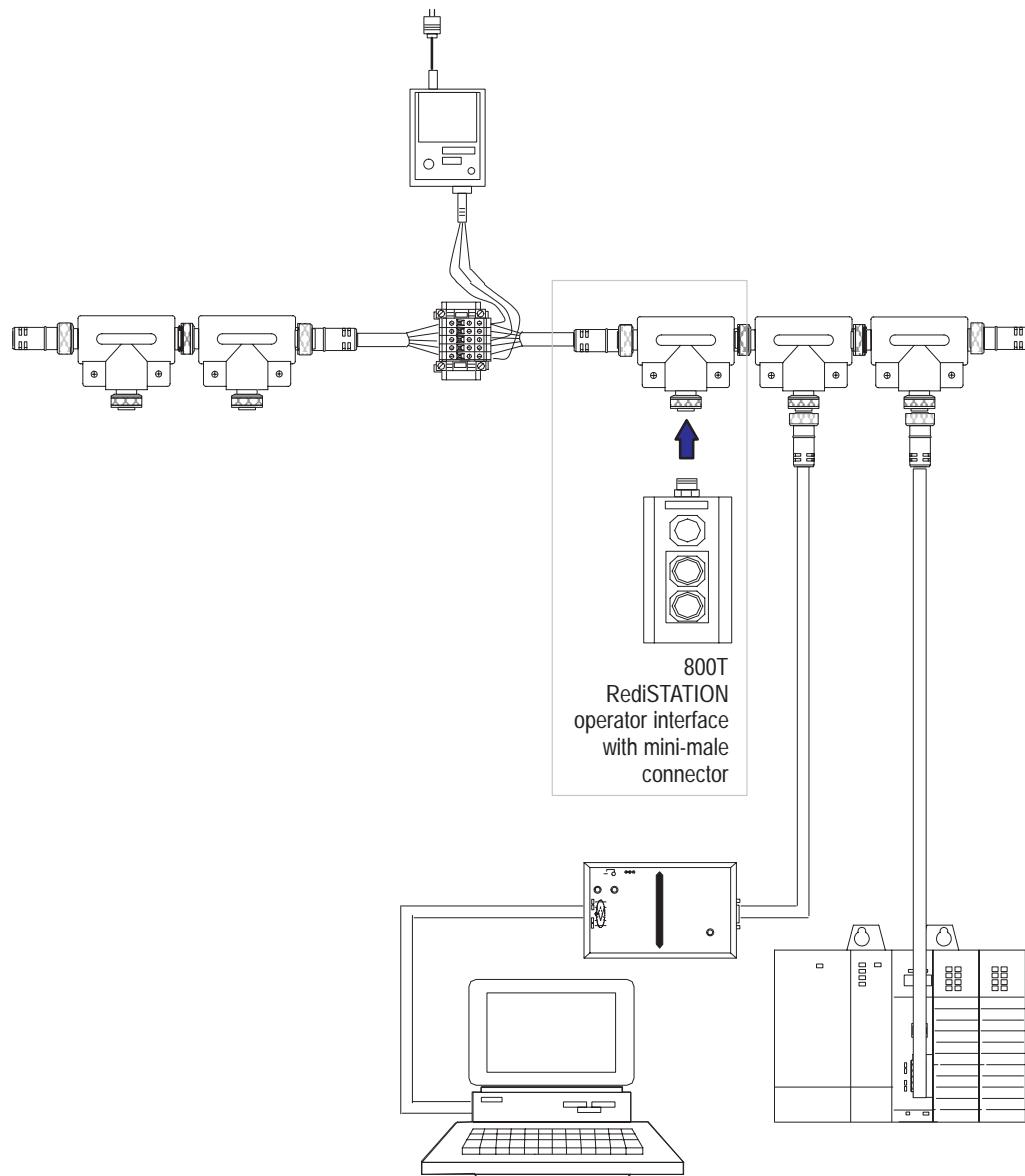
Check the Node Address of the RediSTATION Operator Interface

1. From the *Who* menu, select **Network Who**.

You see this screen:
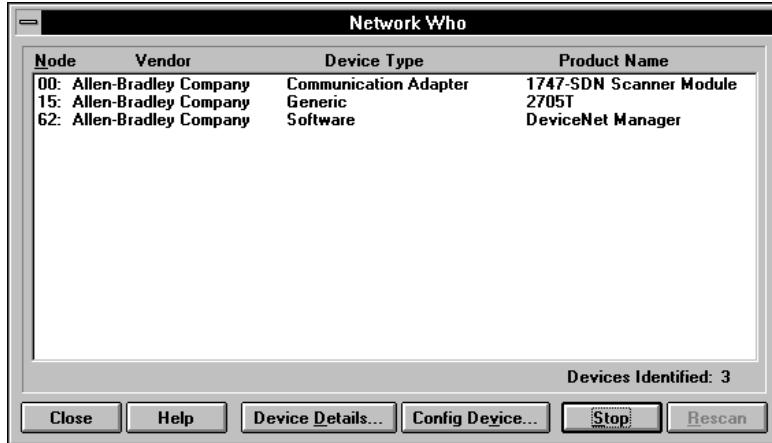
2. After all three devices appear, click on ‖ **Stop** ‖

The node address for the RediSTATION operator interface is **15**. You configured this node address on page 4–2.

3. Click on [**Close**]

Connect the Series 9000 Photoelectric Sensor

Connect the Series 9000 Photoelectric Sensor to the micro-female end of drop line as shown in the area of detail below:

Drop line

mini-male to micro-female conductor

Series 9000 Photoelectric sensor micro-male
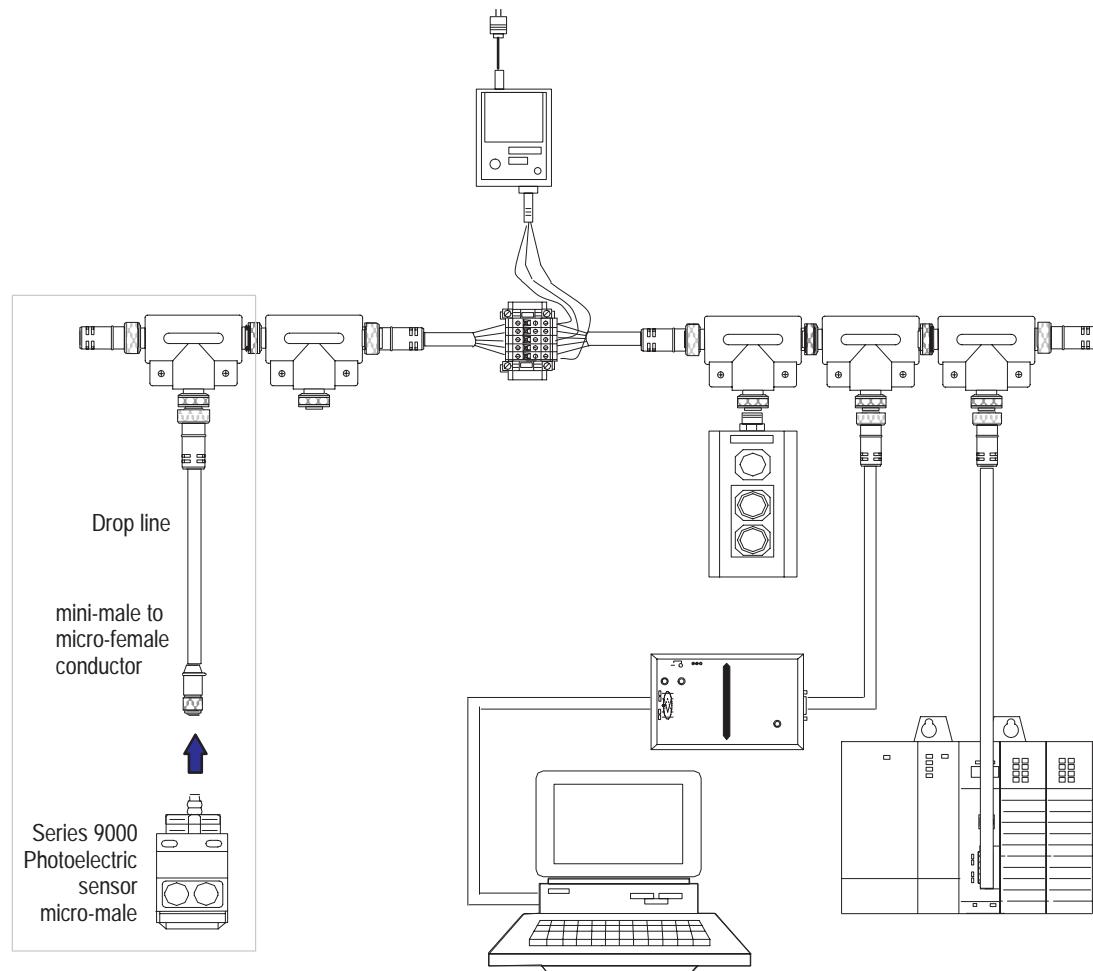
After you connect the photoelectric sensor to the network, look for the illuminated and flashing indicators that indicate the sensor is functioning.

Top of Photo sensor

yellow - output
green - margin
red/green - status

Front of Photo sensor
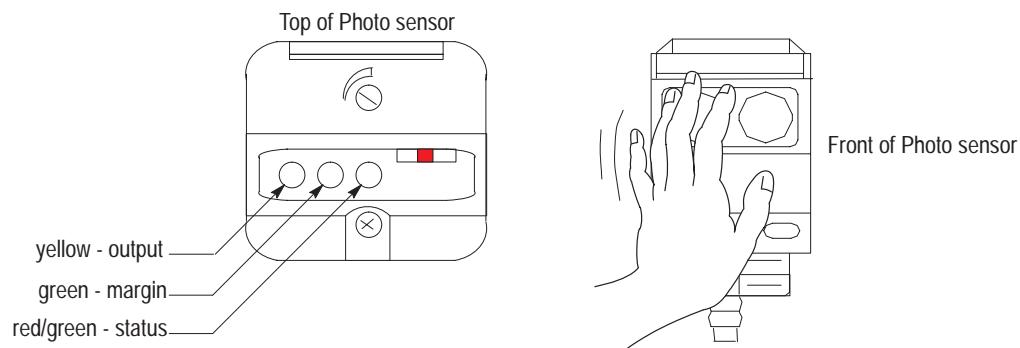
Pass your hand in front of the sensor's eye to block it. Observe how the indicators change as you pass your hand back and forth.

Check the Node Address of the Photoelectric Sensor

1. If you have not already done so, refer to Chapter 3 to set up an online connection.

2. From the *Who* menu, select **Network Who**.

You see this screen:

Node	Vendor	Device Type	Product Name
00:	Allen-Bradley Company	Communication Adapter	1747-SDN Scanner Module
15:	Allen-Bradley Company	Generic	2705T
62:	Allen-Bradley Company	Software	DeviceNet Manager
63:	Allen-Bradley Company	Photoelectric Sensor	Series 9000 - Diffuse

Devices Identified: 4

Close   Help   Device **D**etails...   Config De**v**ice...   **Stop**   Rescan
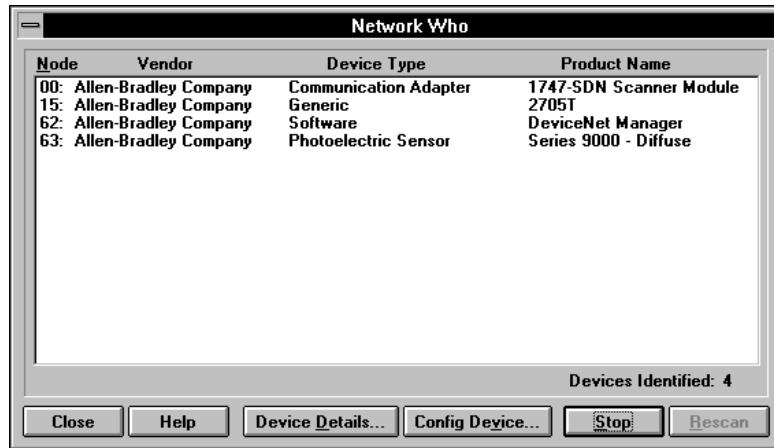
3. After all four devices appear, click on **Stop**

The node address for the photoelectric sensor should be 63. The following steps show you how to use DeviceNetManager to change the node address to **07.**

4. Click on **Close**

Perform Node Commissioning

Commission the node to change the node address.

1. From the *Utilities* menu, select

Install EDS Files...
Create EDS File...

Node Commissioning...
Basic Device Configuration...

Set Up Online Connection...
Go Offline

You see this screen:

2. In the **Current Device Settings** dialog box, scroll to the node address you want to change (in this example, **63**).
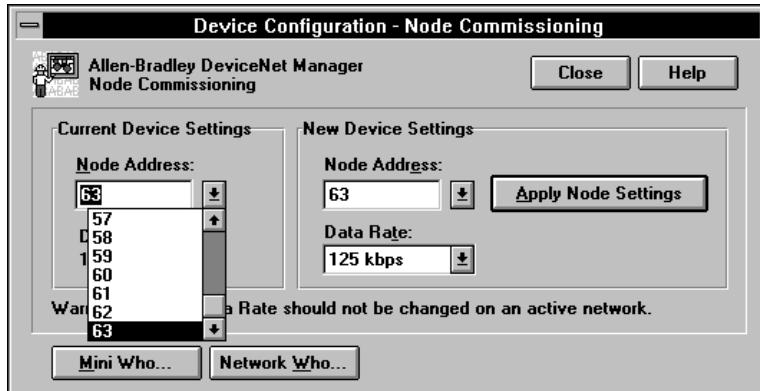
3. In the **New Device Settings** dialog box, scroll to **07**.
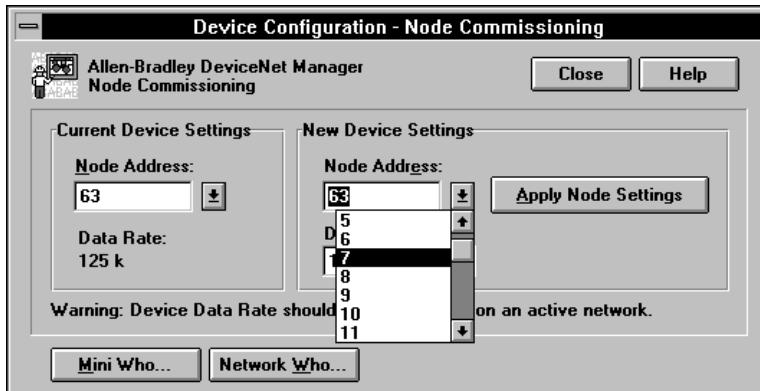
4. Click on

The status bar indicates **Transaction Completed** :

Status ⎯⎯⎯⎯➤

5. Click on to verify the address has changed.

You see this screen:

```
 ┌─────────────────────────────────────────────────────────────┐
 │ ▬                      Network Who                           │
 ├─────────────────────────────────────────────────────────────┤
 │ Node      Vendor              Device Type       Product Name │
 │ ┌─────────────────────────────────────────────────────────┐ │
 │ │00: Allen-Bradley Company  Communication Adapter  1747-SDN Scanner Module
 │ │07: Allen-Bradley Company  Photoelectric Sensor   Series 9000 - Diffuse
 │ │15: Allen-Bradley Company  Generic                2705T
 │ │62: Allen-Bradley Company  Software               DeviceNet Manager
 │ │                                                          │ │
 │ │                                      Devices Identified: 4│ │
 │ └─────────────────────────────────────────────────────────┘ │
 │ [ Close ] [ Help ] [ Device Details... ] [ Config Device... ] [ Stop ] [ Rescan ] │
 └─────────────────────────────────────────────────────────────┘
```
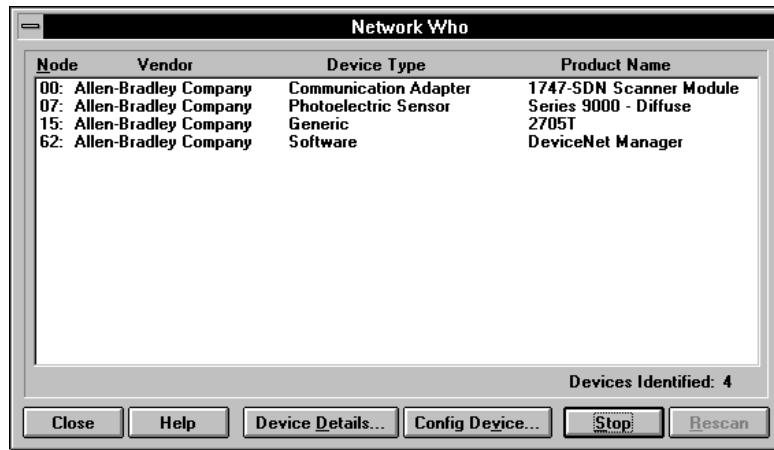
6. After all four devices appear, click on **Stop**

7. Verify that the node address for the photoelectric sensor has changed from **63** to **07**.

8. Click on **Close** to close network who.

9. Click on **Close** to close node commissioning.

Connect the DeviceLink I/O and Limit Switch

Connect the DeviceLink I/O (with the limit switch attached) to the trunk line as shown in the area of detail below:

DeviceLink I/O
mini-male to
mini-female

Limit switch
mini-male
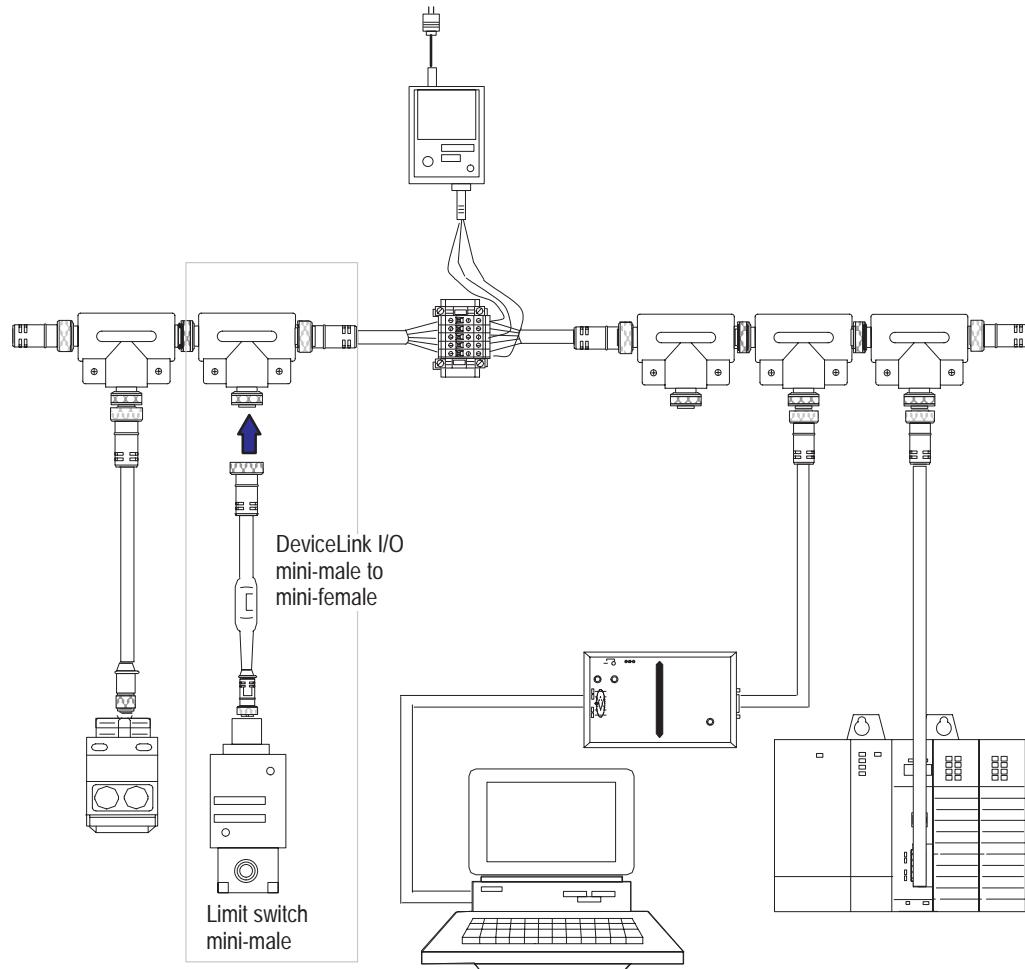
After you connect the DeviceLink I/O to the network, look for the flashing green LED that indicates the device is functioning.

green LED
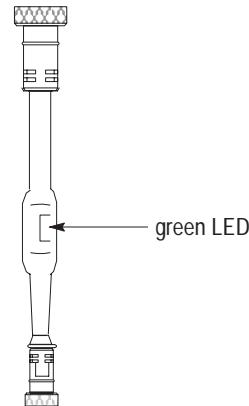
Check the Node Address of the DeviceLink I/O

1. From the *Who* menu, select **Network Who**.

You see this screen:

Node	Vendor	Device Type	Product Name
00:	Allen-Bradley Company	Communication Adapter	1747-SDN Scanner Module
07:	Allen-Bradley Company	Photoelectric Sensor	Series 9000 - Diffuse
15:	Allen-Bradley Company	Generic	2705T
62:	Allen-Bradley Company	Software	DeviceNet Manager
63:	Allen-Bradley Company	Discrete I/O	DeviceLink - mini to mic

Devices Identified: 5

Close | Help | Device Details... | Config Device... | Stop | Rescan
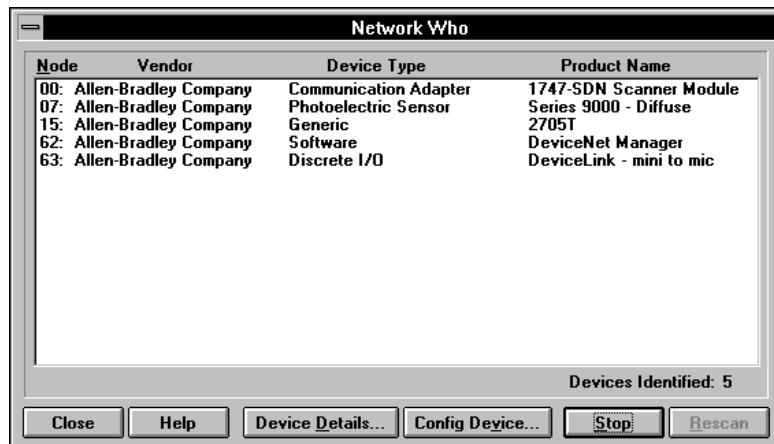
2. After all five devices appear, click on **Stop**

3. Click on **Close**

Perform Node Commissioning

You must change the node address for the DeviceLink I/O to **10.** Commission the node to change the node address.

1. From the *Utilities* menu, select

Install EDS Files...
Create EDS File...
Node Commissioning...
Basic Device Configuration...
Set Up Online Connection...
Go Offline
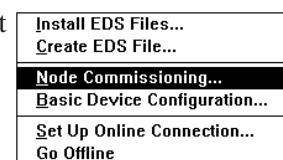
You see the **Device Configuration Node Commissioning** screen:
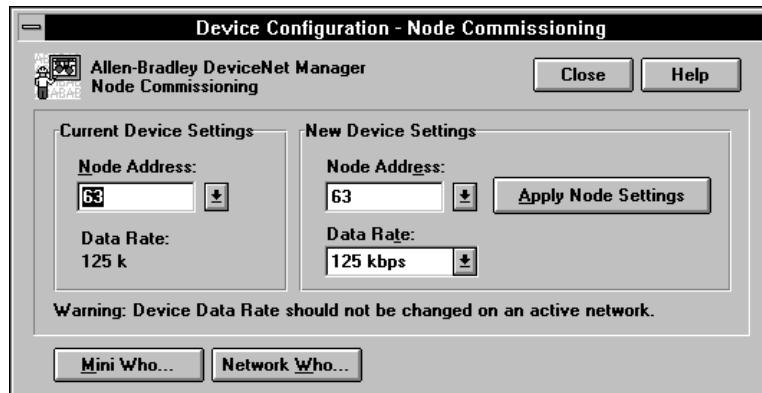
2. In the **Current Device Settings** dialog box, scroll to the node address you want to change (the incorrect node address number for the DeviceLink I/O). In this example, the number is **63.**
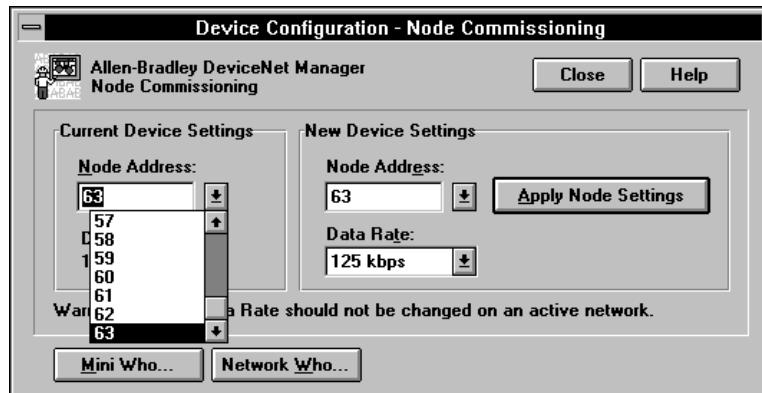
3. In the **New Device Settings** dialog box, scroll to **10**.
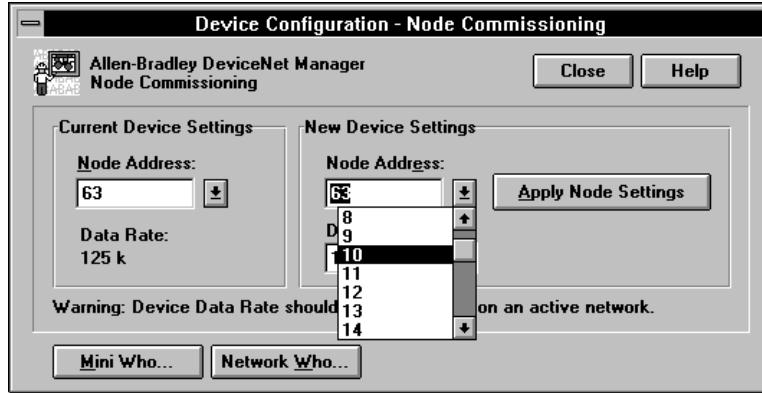
4. Click on [**Apply Node Settings**]

The status bar indicates **Transaction Completed** :

Status ———→ Transaction completed   OnLine KFD-COM1-19200 Addr 62

5. Click on [**Network Who...**] to verify the address has changed.

You see this screen:

Node	Vendor	Device Type	Product Name
Network Who			
00:	Allen-Bradley Company	Communication Adapter	1747-SDN Scanner Module
07:	Allen-Bradley Company	Photoelectric Sensor	Series 9000 - Diffuse
10:	Allen-Bradley Company	Discrete I/O	DeviceLink - mini to mic
15:	Allen-Bradley Company	Generic	2705T
62:	Allen-Bradley Company	Software	DeviceNet Manager

Devices Identified: 5

Close   Help   Device Details...   Config Device...   Stop   Rescan

6. After all five devices appear, click on **Stop**

7. Verify that the node address for the DeviceLink I/O has changed from **63** to **10**.

8. Click on **Close** to close network who.

9. Click on **Close** to close node commissioning.

Summary and What's Next

In this chapter, you learned how to:

• understand what the network should look like

• configure the 800T RediSTATION operator interface

• connect the 800T RediSTATION operator interface

• connect the Series 9000 photoelectric sensor and perform node commissioning

• connect the DeviceLink I/O and limit switch and perform node commissioning

Move on to Chapter 5 to learn how to configure and monitor devices with the DeviceNetManager software.

Configure and Monitor the Devices with DeviceNetManager Software

What this Chapter Contains

The following table describes what this chapter contains and its location.

For information about:	See page
configuring the Series 9000 photoelectric sensor	5–1
configuring the DeviceLink I/O	5–5
configuring the 1747-SDN Scanner Module	5–8
chapter summary and what's next	5–13

Configure the Series 9000 Photoelectric Sensor

Use DeviceNetManager software to change the configuration of the photoelectric sensor:

1. From the *Who* menu, select **Network Who**.
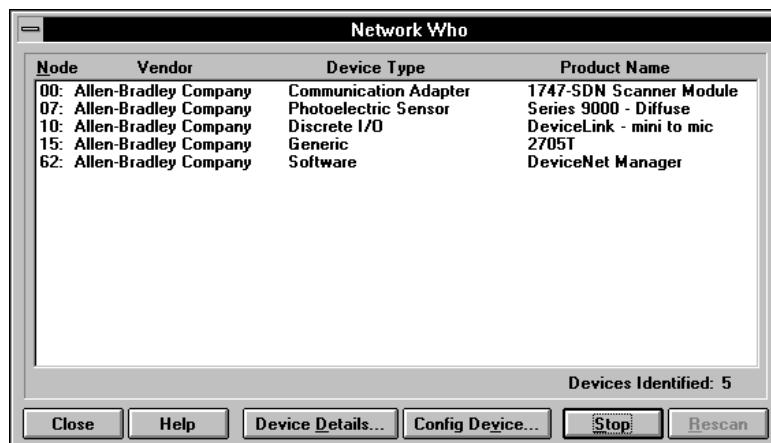
You see this screen:

2. After all five devices appear, click on ![Stop]

3. Double-click on the **Photoelectric Sensor** to open its **Device Configuration – Enhanced Mode** screen.

You see this screen:
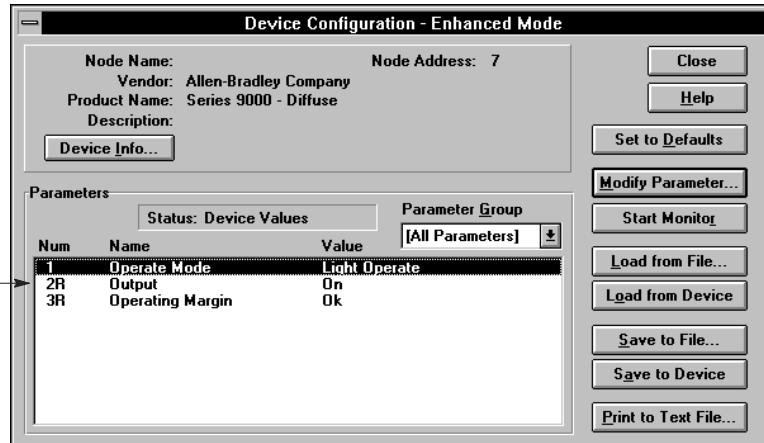
The photoelectric sensor supports these three parameters. **Operate Mode** is the only configurable parameter. **Output** and **Operating Margin** are "read only" as indicated by the letter "R."

The sensor is configured for **Light Operate**.

4. To verify this, pass your hand in front of the sensor and you see that the output (yellow) and margin (green) indicators illuminate. This indicates that the sensor is in **Light Operate** mode.

Front of photoelectric sensor

Top of photoelectric sensor

These indicators illuminate when the photoelectric sensor detects an object.

yellow - output
green - margin
red/green - status
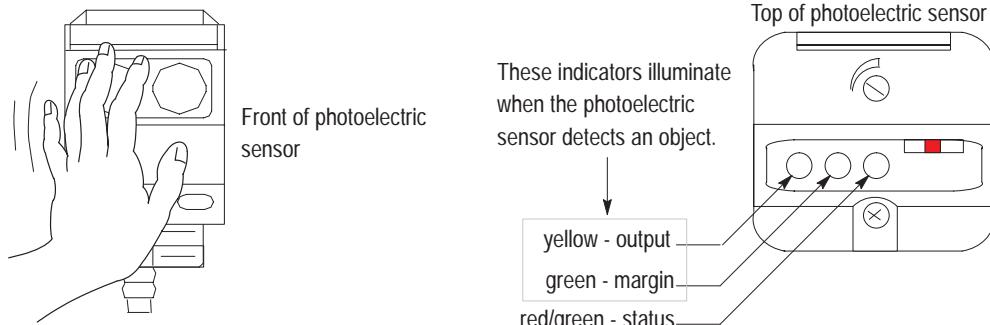
5. To change this parameter from **Light Operate** to **Dark Operate**, first highlight the **Output Mode** parameter as shown in the above screen, then click on **Modify Parameter...**

You see this screen:
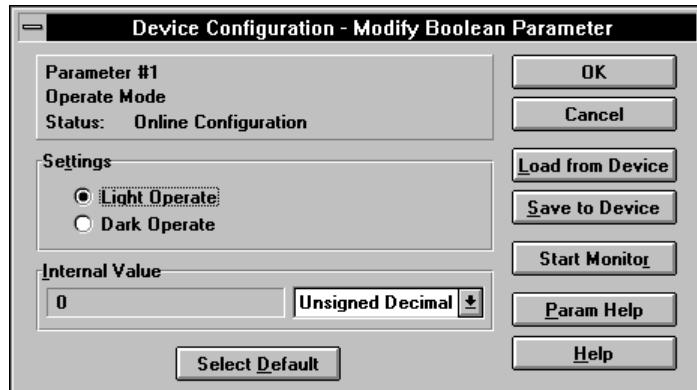
6. In the **Settings** dialog box, click in the **Dark Operate** radio button.

You see the **Dark Operate** area become highlighted:

Settings
- ○ Light Operate
- ⦿ Dark Operate

7. Click on   **S‌ave to Device**

8. Click on   **OK**

The **Parameters** dialog box shows that the mode has changed from light to dark operate:

Parameters

Status: Modified

Parameter Group
[All Parameters] ±

Num	Name	Value
1	Operate Mode	Dark Operate
2R	Output	On
3R	Operating Margin	Ok
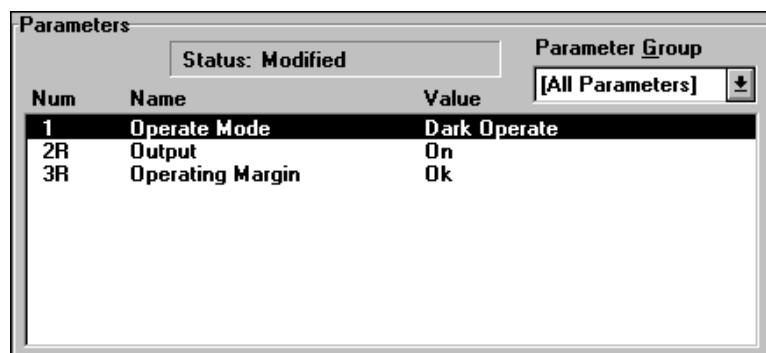
9. To verify this, pass your hand in front of the photoelectric sensor. When the photoelectric sensor detects your hand, the output indicator (yellow) goes off and the margin indicator (green) goes on. This indicates that the sensor is in Dark Operate mode.

Front of photoelectric sensor

Top of photoelectric sensor

green - margin
yellow - output
red/green - status
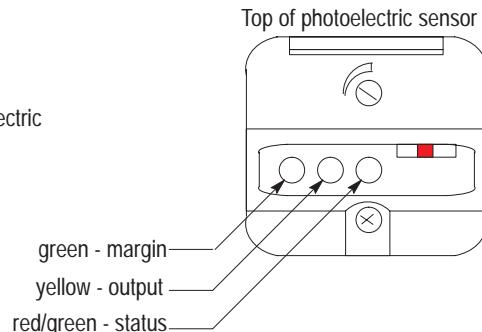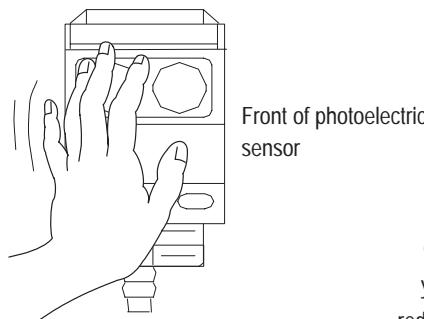
10. To return to Light Operate mode, repeat steps 5–8 and select **Light Operate**.

11. To close the **Device Configuration** screen, click on

Close

Monitor the Status of the Photoelectric Sensor

To monitor the status of the photoelectric sensor:

1. In the **Device Configuration** screen, click on

> **Start Monitor**

You see how the DeviceNet Manager software monitors and reports status:

```
┌─────────────────────────────────────────────────────────────────┐
│ ─            Device Configuration - Enhanced Mode                 │
├───────────────────────────────────────────────────────────────────
│   Node Name:                        Node Address:  63    [ Close ] │
│       Vendor:  Allen-Bradley Company                               │
│ Product Name:  Series 9000 - Diffuse                     [ Help  ] │
│  Description:                                                      │
│   [ Device Info... ]                              [ Set to Defaults ]│
│                                                                    │
│ ┌ Parameters ─────────────────────────────┐      [ Modify Parameter... ]│
│ │   ──►  Status: Monitoring       Parameter Group  [ Stop Monitor ]│
│ │                                 [All Parameters] ±               │
│ │   Num    Name              Value                 [ Load from File... ]│
│ │  *1      Operate Mode      Light Operate         [ Load from Device ]│
│ │   2R     Output            On                                    │
│ │   3R     Operating Margin  Ok                    [ Save to File... ]│
│ │                                                  [ Save to Device ]│
│ │                                                                  │
│ │                                                  [ Print to Text File... ]│
│ └──────────────────────────────────────────┘                     │
└─────────────────────────────────────────────────────────────────┘
```

- Status flashes **Monitoring**
- Parameters are repeatedly scanned
- **Value** reports current status

2. Hold your hand in front on the photoelectric sensor.

You see how the **Output Value** changes:

```
┌ Parameters ──────────────────────────────────────────────────┐
│                                            Parameter Group     │
│           Status: Monitoring               [All Parameters] ±  │
│                                                                │
│   Num    Name               Value                              │
│   1      Operate Mode       Light Operate                      │
│   2R     Output             Off                                │
│  *3R     Operating Margin   Ok                                 │
│                                                                │
└────────────────────────────────────────────────────────────────┘
```

- Output goes from **On** to **Off**
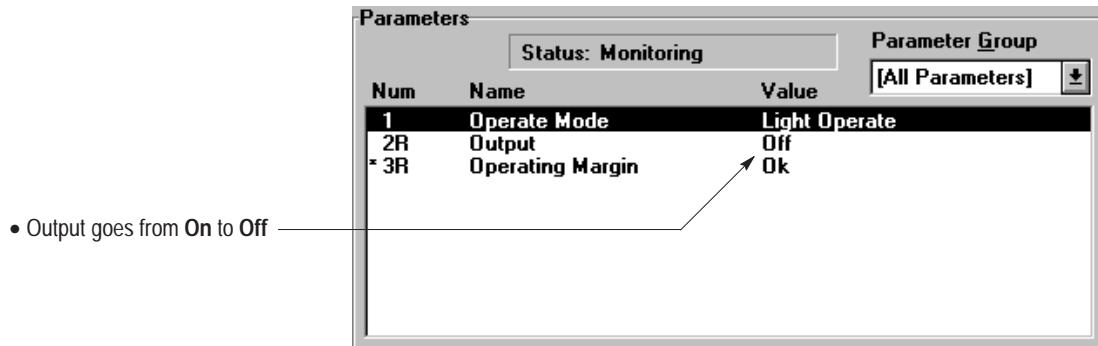
3. Use your thumb to cover part one of the lenses on the photoelectric sensor.

You see how the **Operating Margin Value** changes:

```
┌ Parameters ──────────────────────────────────────────────────┐
│                                            Parameter Group     │
│           Status: Monitoring               [All Parameters] ±  │
│                                                                │
│   Num    Name               Value                              │
│   1      Operate Mode       Light Operate                      │
│  *2R     Output             Off                                │
│   3R     Operating Margin   Low Margin                         │
│                                                                │
└────────────────────────────────────────────────────────────────┘
```

- Operating Margin goes from **OK** to **Low Margin**

4. Click on [**Stop Monitor**]
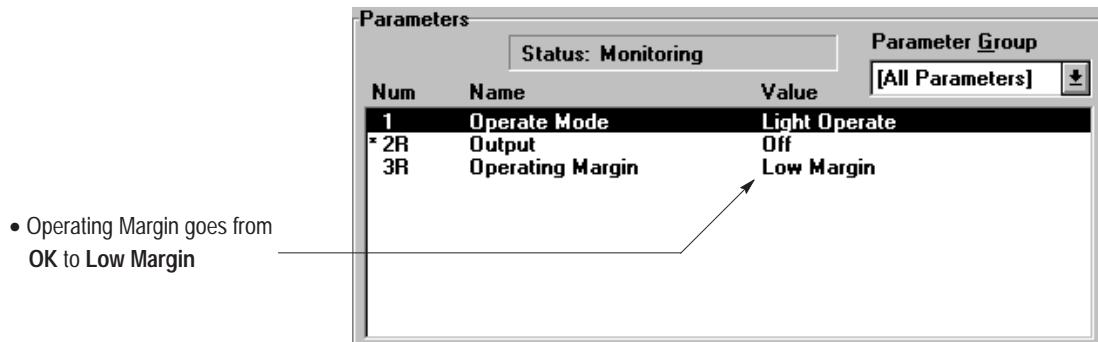
5. Click on [**Close**]

Configure the DeviceLink I/O

Continue with DeviceNetManager software to change the configuration of the DeviceLink I/O:

1. From the **Network Who** screen, double-click on the **DeviceLink - mini to mic** to open its **Device Configuration – Enhanced Mode** screen.

```
┌─────────────────────────── Network Who ───────────────────────────┐
│ Node      Vendor              Device Type           Product Name          │
│ 00: Allen-Bradley Company   Communication Adapter   1747-SDN Scanner Module│
│ 07: Allen-Bradley Company   Photoelectric Sensor    Series 9000 - Diffuse  │
│ 10: Allen-Bradley Company   Discrete I/O            DeviceLink - mini to mic│
│ 15: Allen-Bradley Company   Generic                 2705T                  │
│ 62: Allen-Bradley Company   Software                DeviceNet Manager      │
│                                                                            │
│                                                     Devices Identified: 5  │
│ [ Close ] [ Help ] [ Device Details... ] [ Config Device... ] [ Stop ] [ Rescan ]│
└────────────────────────────────────────────────────────────────────┘
```

You see this screen:

```
┌──────────── Device Configuration - Enhanced Mode ────────────┐
│       Node Name:              Node Address:  10      [ Close ]  │
│          Vendor:  Allen-Bradley Company                        │
│    Product Name:  DeviceLink - mini to micro connector [ Help ]│
│     Description:                                               │
│   [ Device Info... ]                        [ Set to Defaults ]│
│                                                                │
│  ┌Parameters────────────────────────────┐  [ Modify Parameter...]│
│  │     Status: Device Values   Parameter Group  [ Start Monitor ]│
│  │                             [All Parameters] ▼                │
│  │  Num   Name              Value         [ Load from File... ] │
│  │  1     On Filter         0 ms Filter   [ Load from Device ]  │
│  │  2     Off Filter        0 ms Filter                         │
│  │  3R    Output            Off           [ Save to File... ]   │
│  │                                        [ Save to Device ]    │
│  │                                        [ Print to Text File...]│
│  └────────────────────────────────────────┘                    │
└────────────────────────────────────────────────────────────────┘
```

- The **On Filter Value** indicates the DeviceLink default – **0ms Filter**

2. To change this parameter from **0ms** to **25ms**, first highlight the **On Filter** parameter as shown in the above screen, then click on

[**Modify Parameter...**]

You see this screen:

```
┌──────────────────────────────────────────────────────────┐
│ ▬    Device Configuration - Modify Boolean Parameter       │
├──────────────────────────────────────────────────────────┤
│  Parameter #1                            ┌──────────────┐  │
│  On Filter                               │      OK      │  │
│  Status:    Online Configuration         └──────────────┘  │
│                                          ┌──────────────┐  │
│  ┌Settings─────────────────────────┐     │   Cancel     │  │
│  │                                  │     └──────────────┘  │
│  │   ⦿  0 ms Filter                 │     ┌──────────────┐  │
│  │   ○  25 ms Filter                │     │Load from Device│ │
│  │                                  │     └──────────────┘  │
│  └──────────────────────────────────┘     ┌──────────────┐  │
│                                          │Save to Device │  │
│  ┌Internal Value───────────────────┐     └──────────────┘  │
│  │ ┌──────────────┐  ┌───────────┐ │     ┌──────────────┐  │
│  │ │ 0            │  │Unsigned Decimal ±│ │Start Monitor│  │
│  │ └──────────────┘  └───────────┘ │     └──────────────┘  │
│  └──────────────────────────────────┘     ┌──────────────┐  │
│          ┌─────────────────┐             │  Param Help  │  │
│          │ Select Default  │             └──────────────┘  │
│          └─────────────────┘             ┌──────────────┐  │
│                                          │     Help     │  │
│                                          └──────────────┘  │
└──────────────────────────────────────────────────────────┘
```
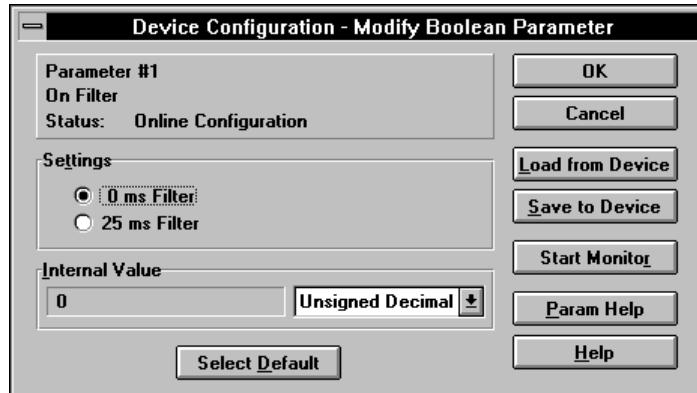
3. In the **Settings** dialog box, click on the **25ms Filter** radio button.

You see the **25ms Filter** area become highlighted:

```
┌Settings──────────────────────────────────────────┐
│                                                   │
│     ○   0 ms Filter                               │
│     ⦿   25 ms Filter                              │
│                                                   │
└───────────────────────────────────────────────────┘
```
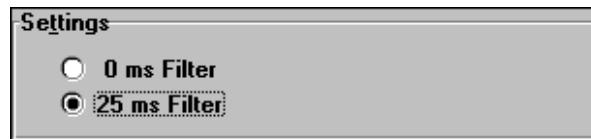
4. Click on ┌──────────────────────┐
              │   OK   │
              └──────────────────────┘

The **Parameters** dialog box shows that the mode has changed from 0ms to 25ms:

```
┌Parameters────────────────────────────────────────────────────┐
│              ┌───────────────────────┐   Parameter Group      │
│              │   Status: Modified    │   ┌──────────────────┐ │
│              └───────────────────────┘   │[All Parameters] ± │ │
│   Num      Name                Value     └──────────────────┘ │
│   ─────────────────────────────────────────────────────────── │
│   1        On Filter           25 ms Filter                    │
│   2        Off Filter          0 ms Filter                     │
│   3R       Output              Off                             │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
└───────────────────────────────────────────────────────────────┘
```
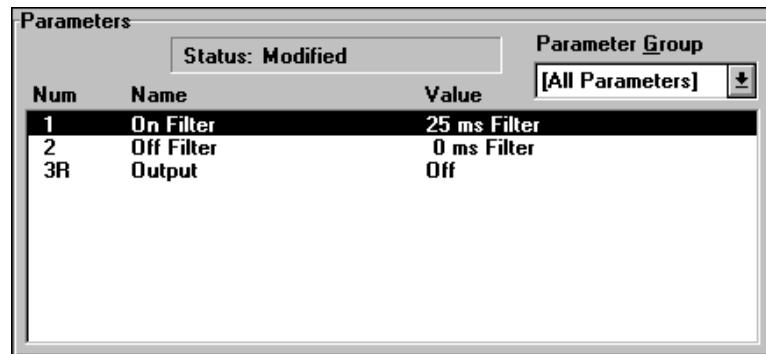
5. To close the **Device Configuration** screen, click on

┌──────────────────────┐
│   Close   │
└──────────────────────┘

Monitor the Status of the DeviceLink I/O

To monitor the status of the DeviceLink I/O:

1. In the **Device Configuration** screen, click on

> **Start Monitor**

You see how DeviceNet Manager software monitors and reports status of the DeviceLink I/O:

```
┌─────────────────────────────────────────────────────────────────┐
│ ─              Device Configuration - Enhanced Mode               │
│                                                                   │
│      Node Name:                    Node Address:  10    ┌───────┐ │
│         Vendor:  Allen-Bradley Company                  │ Close │ │
│   Product Name:  DeviceLink - mini to micro connector   └───────┘ │
│    Description:                                         ┌───────┐  │
│     Device Info...                                      │ Help  │  │
│                                                         └───────┘  │
│  ┌Parameters─────────────────────────────────────┐  Set to Defaults│
│  │            Status: Monitoring      Parameter Group Modify Parameter... │
│  │                                   [All Parameters] ± Stop Monitor │
│  │  Num    Name                Value                               │
│  │   1     On Filter           0 ms Filter           Load from File...│
│  │ * 2     Off Filter          0 ms Filter           Load from Device│
│  │   3R    Output              Off                                 │
│  │                                                   Save to File...│
│  │                                                   Save to Device│
│  │                                                   Print to Text File...│
│  └───────────────────────────────────────────────┘               │
└───────────────────────────────────────────────────────────────────┘
```

- Status flashes **Monitoring**
- Parameters are repeatedly scanned
- **Value** reports current status

2. Turn and hold the switch on the limit switch.

You see how the **Output Value** changes:

```
┌Parameters──────────────────────────────────────────────┐
│                                        Parameter Group  │
│         Status: Monitoring            [All Parameters] ±│
│                                                         │
│   Num    Name                Value                      │
│    1     On Filter           0 ms Filter                │
│    2     Off Filter          0 ms Filter                │
│ * 3R     Output              On                         │
│                                                         │
└─────────────────────────────────────────────────────────┘
```

- Output goes from **Off** to **On**
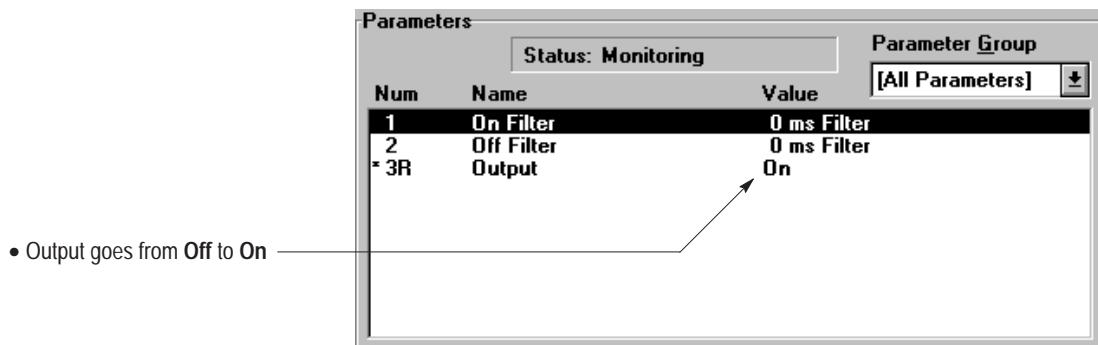
3. Click on   **Stop Monitor**

**4.** Click on   **Close**

Configure the 1747-SDN Scanner Module

Continue with DeviceNetManager software to configure the 1747-SDN Scanner Module.

1. From the **Network Who** screen, double-click on the **1747-SDN Scanner Module** to open its **Module Configuration** screen**.**

```
┌─────────────────────────────────────────────────────────────────┐
│ ▬                        Network Who                             │
├─────────────────────────────────────────────────────────────────┤
│ Node      Vendor              Device Type          Product Name  │
│ 00: Allen-Bradley Company   Communication Adapter  1747-SDN Scanner Module │
│ 07: Allen-Bradley Company   Photoelectric Sensor   Series 9000 - Diffuse   │
│ 10: Allen-Bradley Company   Discrete I/O           DeviceLink - mini to mic│
│ 15: Allen-Bradley Company   Generic                2705T                   │
│ 62: Allen-Bradley Company   Software               DeviceNet Manager       │
│                                                                 │
│                                              Devices Identified: 5 │
├─────────────────────────────────────────────────────────────────┤
│ [ Close ] [ Help ] [ Device Details... ] [ Config Device... ] [ Stop ] [ Rescan ] │
└─────────────────────────────────────────────────────────────────┘
```

You see this screen:

```
┌─────────────────────────────────────────────────────────────┐
│ ▬          1747-SDN Module Configuration : [SDN]            │
├─────────────────────────────────────────────────────────────┤
│ ┌Module Settings─────────────────────────────────────────┐  │
│ │ Project Name:              Network Name:                │  │
│ │ Module Name:               Node Address:  0             │  │
│ │ Access [ DeviceNet    ▼]   Slot [ 1 ]  ◄────            │  │
│ │                          ┌Load From──────────────┐      │  │
│ │ ┌─────────────────────┐  │  [ SDN ]  [ File... ] │      │  │
│ │ │ I/O Comms  [X] Enabled│ │  [ Module Defaults ] │      │  │
│ │ │ Interscan Delay [10] ms.└───────────────────────┘      │  │
│ │ │ Bkgd Poll Ratio [1]  │  ┌Save To────────────────┐      │  │
│ │ └─────────────────────┘  │  [ SDN ]  [ File... ]  │      │  │
│ │                          └────────────────────────┘      │  │
│ │ [ Assign Names from Project ]   [ Edit Scan List... ]    │  │
│ └─────────────────────────────────────────────────────────┘  │
│ [ Close ]  [ Help ]                                          │
└─────────────────────────────────────────────────────────────┘
```

Specify the SLC chassis slot where the scanner module is installed.

Note: If you are using a PLC-5 chassis with a 1771-SDN scanner module, select the rack/group/slot of the 1771-SDN Scanner Module.

2. In the **Load From** dialog box, click on   **SDN**

3. In the **Module Settings** dialog box, specify the SLC chassis slot where the scanner module is installed.

4. In the **Module Settings** dialog box, click on

   Edit Scan List...

You see this screen:

```
┌─────────────────────────────────────────────────────────────────┐
│ ─                     1747-SDN Scan List Editor : [WHO]           │
│ Node   Name   Mapped   Active   Rx Size   Tx Size   Type  ┌Load From─┐│
│ 07            No/--     Yes      1         0         S     │ SDN... │ File...││
│ 10            No/--     Yes      1         0         S     └──────────┘│
│ 15            No/No     Yes      1         1         P     ┌Save To───┐│
│                                                           │ SDN... │ File...││
│                                                           └──────────┘│
│                                                           ┌Add Devices From┐│
│                                                           │ Proj... │ Who... ││
│                                                           └──────────┘│
│ ┌Edit Selection─────────────────────────────────────┐   ┌Scan List Tools┐│
│ │ Prod Type:              □ Active In Scanlist        │   │  Auto Map...  ││
│ │ Vendor:                 ┌Assign Key To──────┐       │   ├───────────────┤│
│ │ Cat No:                 │ □ Device Type      │      │   │ Datatable Map...││
│ │ Revision:               │ □ Vendor           │      │   │ Display Filters...││
│ │ ┌Edit I/O Parameters...┐  ┌Remove┐ □ Cat No. │      │   │ Print to File...││
│ │ └──────────────────────┘  └──────┘ □ Revision│      │   └───────────────┘│
│ ┌Close┐  ┌Help┐            ┌Select All┐                                   │
└─────────────────────────────────────────────────────────────────┘
```

5. Click on [**Select All**]

6. In the Scan List Tools dialog box, click on

[**Auto Map...**]

You see this screen:

```
┌─────────────────────────────────────────────────────────────────┐
│ ─                     1747-SDN Auto Map Options                   │
│ ┌Regions to Map/Unmap──────────────────┐  ┌Mapping Method──────┐ │
│ │                                        │  │ ● Node Order       │ │
│ │ ┌───────────────────────────────────┐ │  │ ○ Size Order       │ │
│ │ │ ☒ Input File:        Start Word:  │ │  │ ○ Byte Align All   │ │
│ │ │ Discrete Input    ▼    0          │ │  │ ○ Word Align All   │ │
│ │ │                                   │ │  └────────────────────┘ │
│ │ │ ☒ Output File:       Start Word:  │ │    ┌─────────┐          │
│ │ │ Discrete Output   ▼    0          │ │    │  Map    │          │
│ │ └───────────────────────────────────┘ │    └─────────┘          │
│ │                                        │    ┌─────────┐          │
│ │                                        │    │ Unmap   │          │
│ └────────────────────────────────────────┘   └─────────┘          │
│  ┌Cancel┐  ┌Help┐                                                 │
└─────────────────────────────────────────────────────────────────┘
```

Note: If you are using a 1771-SDN scanner module, the module should be mapped into Block Transfer 62 input and output.
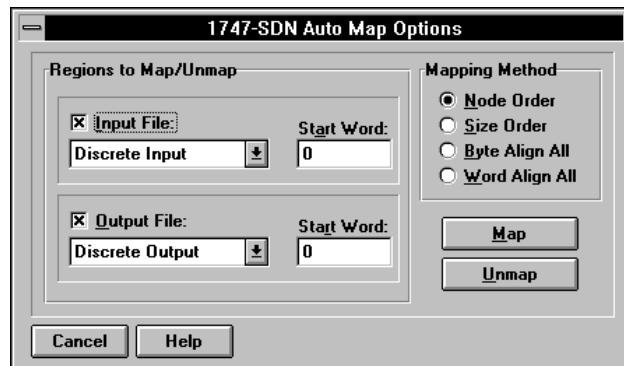
7. Click on [**Map**]

You see this screen:

```
┌────────────────────────────────────┐
│ ─          DeviceNet Manager        │
│                                      │
│   (?)   Are you sure?                │
│                                      │
│       ┌─────┐      ┌─────┐           │
│       │ Yes │      │ No  │           │
│       └─────┘      └─────┘           │
└────────────────────────────────────┘
```

8. Click on [**Yes**]

You return to this screen:

1747-SDN Scan List Editor : [WHO]

Node	Name	Mapped	Active	Rx Size	Tx Size	Type
07		Yes/--	Yes	1	0	S
10		Yes/--	Yes	1	0	S
15		Yes/Yes	Yes	1	1	P

Load From: SDN... File...

Save To: SDN... File...

Add Devices From: Proj... Who...

Edit Selection

Prod Type:
Vendor:
Cat No:
Revision:

☐ Active In Scanlist

Assign Key To:
☐ Device Type
☐ Vendor
☐ Cat No.
☐ Revision

Edit I/O Parameters...   Remove

Scan List Tools
Auto Map...
Datatable Map...
Display Filters...
Print to File...

Close   Help   Select All

DeviceNet Manager software verifies that the devices have been mapped.

9. Click on **Datatable Map...**

You see this screen:

1747-SDN Datatable Map

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
I:1.0	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
I:1.1	10	10	10	10	10	10	10	10	7	7	7	7	7	7	7	7
I:1.2									15	15	15	15	15	15	15	15
I:1.3																
I:1.4																
I:1.5																
I:1.6																
I:1.7																
I:1.8																
I:1.9																

Display Mode: ○ Data Entry ● Browse   Double-click on word to display bit mapping

Device Select: 07   Photoelectric Sensor   42GNP-9000-QD1
Data Map: ● Input ○ Output
Map Segment: ● 1 ○ 2 ○ 3 ○ 4
Map Data From: Strobe Message   Byte 0   Bit 0
Map Data To: Discrete   I:1. 1   Bit 0   No. Bits 8

Apply Segment
Delete Segment

Close   Help   Print to File

DeviceLink I/O
Node Address 10

Photoelectric Sensor
Node Address 07

800T RediSTATION
Node Address 15

Note: If you are using a 1771-SDN scanner module, PLC-5 data table with block transfer addresses will appear.

Observe how the devices' node addresses are assigned as inputs in the data table map.

10. In the **Data Map** area, click on the **Output** radio button.

11. Click on **Close**

You return to this screen:

1747-SDN Scan List Editor : [WHO]

Node	Name	Mapped	Active	Rx Size	Tx Size	Type
07		Yes/--	Yes	1	0	S
10		Yes/--	Yes	1	0	S
15		Yes/Yes	Yes	1	1	P

Load From: SDN... File...

Save To: SDN... File...

Add Devices From: Proj... Who...

Edit Selection

Prod Type:
Vendor:
Cat No:
Revision:

☐ Active In Scanlist

Assign Key To:
☐ Device Type
☐ Vendor
☐ Cat No.
☐ Revision

Edit I/O Parameters...   Remove

Scan List Tools
Auto Map...
Datatable Map...
Display Filters...
Print to File...

Close   Help   Select All

12. Click on **Select All**

You see that all devices are highlighted:

1747-SDN Scan List Editor : [WHO]						
Node	**Name**	**Mapped**	**Active**	**Rx Size**	**Tx Size**	**Type**
07		Yes/--	Yes	1	0	S
10		Yes/--	Yes	1	0	S
15		Yes/Yes	Yes	1	1	P

Load From
SDN...   File...

Save To
SDN...   File...

Add Devices From
Proj...   Who...

Edit Selection
Prod Type:
Vendor:
Cat No:
Revision:
Edit I/O Parameters...   Remove

☒ **Active In Scanlist**
Assign Key To
☒ Device Type
☐ Vendor
☐ Cat No.
☐ Revision

Scan List Tools
Auto Map...
Datatable Map...
Display Filters...
Print to File...

Close   Help   Select All

13. In the **Save To** dialog box, click on   SDN...

You see this screen:

1747-SDN Scan List Editor - Download

Download
⊙ Selected Scan List Records
○ All Records
○ Select Range

Range Select
From: 0   To: 63

OK
Cancel
Help

☐ Only Download Active Records
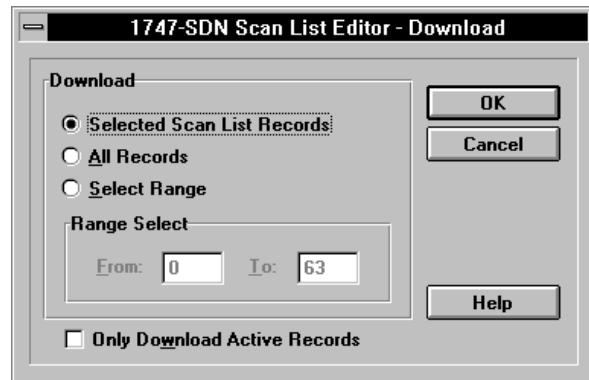
14. Click on   OK

You see this screen:

DeviceNet Manager

ⓘ The scanner will be unavailable for 5-10 seconds while updating Flash memory

OK

15. Click on   OK

Wait a few more moments for the download to complete.
When the download is complete and the scanner has rebooted:

• the scanner module alternately flashes **80** and **00**

*Device**Net***

STATUS

MODULE   **NET**

ADDRESS/ERROR

Node Address and Status Display
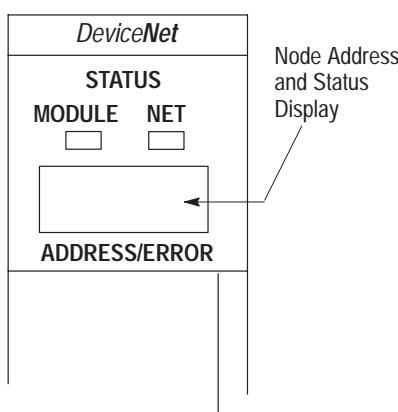
Top part of module

- the DeviceLink I/O status is solid green

green LED
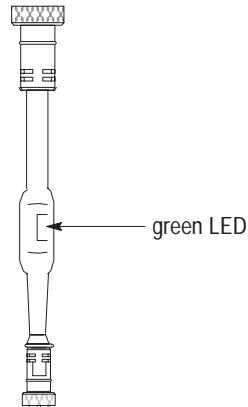
- the photoelectric sensor status is solid green

Top of photoelectric sensor

green status
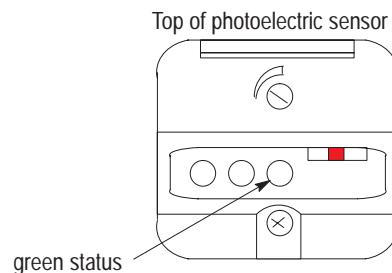
- the DeviceNetManager software status bar indicates **Transaction Completed**:

Status ──────
| Transaction completed | | OnLine | KFD-COM1-19200 | Addr 62 |

- The **Scan List Editor** screen also indicates that the devices have been mapped:

1747-SDN Scan List Editor : [STARTER.SL4]

Node	Name	Mapped	Active	Rx Size	Tx Size	Type
07		Yes/--	Yes	1	0	S
10		Yes/--	Yes	1	0	S
15		Yes/Yes	Yes	1	1	P

Load From
SDN...   File...

Save To
SDN...   File...

Add Devices From
Proj...   Who...

Devices are mapped ──────

Edit Selection
Prod Type:
Vendor:
Cat No:
Revision:

☐ Active In Scanlist
Assign Key To
☐ Device Type
☐ Vendor
☐ Cat No.
☐ Revision

Scan List Tools
Auto Map...
Datatable Map...
Display Filters...
Print to File...

Edit I/O Parameters...   Remove

Close   Help   Select All

16. Click on   **Close**

You see this screen:

17. Click on either [Yes] or [No]

We recommend that you save your scanner configuration files for future use.

Summary and What's Next

In this chapter, you learned how to configure and monitor these devices using DeviceNetManager software:

- Series 9000 photoelectric sensor
- DeviceLink I/O
- 1747-SDN Scanner Module

Move on to Chapter 6 to learn how to use APS ladder logic with DeviceNetManager software.

Use APS with the DeviceNet Starter Kit to Perform Control and Diagnostics Examples

What this Chapter Contains

This chapter describes how to use Advanced Programming Software (APS) with the DeviceNet Starter kit for DeviceNet control and diagnostics examples:

To:	See page
create the ladder logic program	6–2
use APS with DeviceNetManager to perform DeviceNet control and diagnostics examples	6–4
read the chapter summary	6–7

To complete the tasks in this chapter, you must have:

- Windows with DeviceNetManager software open
- your DeviceNet network running with an online connection
- APS installed

Create the Ladder Logic Program

Use APS to create the following ladder logic program:

```
                                                    ┌ MOV ──────────────┐
                                                    │ MOVE              │──
                                                    │ Source         1  │
                                                    │                   │
                                                    │ Dest       0:1.0  │
                                                    │                1  │
                                                    └───────────────────┘


                                                    ┌ MOV ──────────────┐
                                                    │ MOVE              │──
                                                    │ Source  M1:1.216  │
                                                    │                *  │
                                                    │ Dest      N152:0  │
                                                    │                0  │
                                                    └───────────────────┘


      I:1                                                          0:1
   ──┤ ] [ ──┬──────────────────────────────────────────────────( ) ──
      16     │                                                     16
             │
             │
             │
      N152:0 │
   ──┤ ] [ ──┤
      10     │
             │
             │
      N152:0 │
   ──┤ ] [ ──┤
      7      │
             │
             │
      0:1    │
   ──┤ ] [ ──┘
      18
```

```
        N152:0                                                    0:1
     ┌───] [──────────────────────────────────────────────────────( )───
     │      7                                                        17
     │
     │
     │  N152:0
     ├───] [──────
     │     10
     │
     │
     │   I:1
     └───] [──────
         17


        I:1          I:1                                           0:1
     ───] [──────────] / [─────────────────────────────────────────(L)───
        33           32                                             10


        I:1          I:1                                           0:1
     ───] [──────────] / [─────────────────────────────────────────(U)───
        32           33                                             18


     ────────────────────────────[END OF FILE]───────────────────────
```
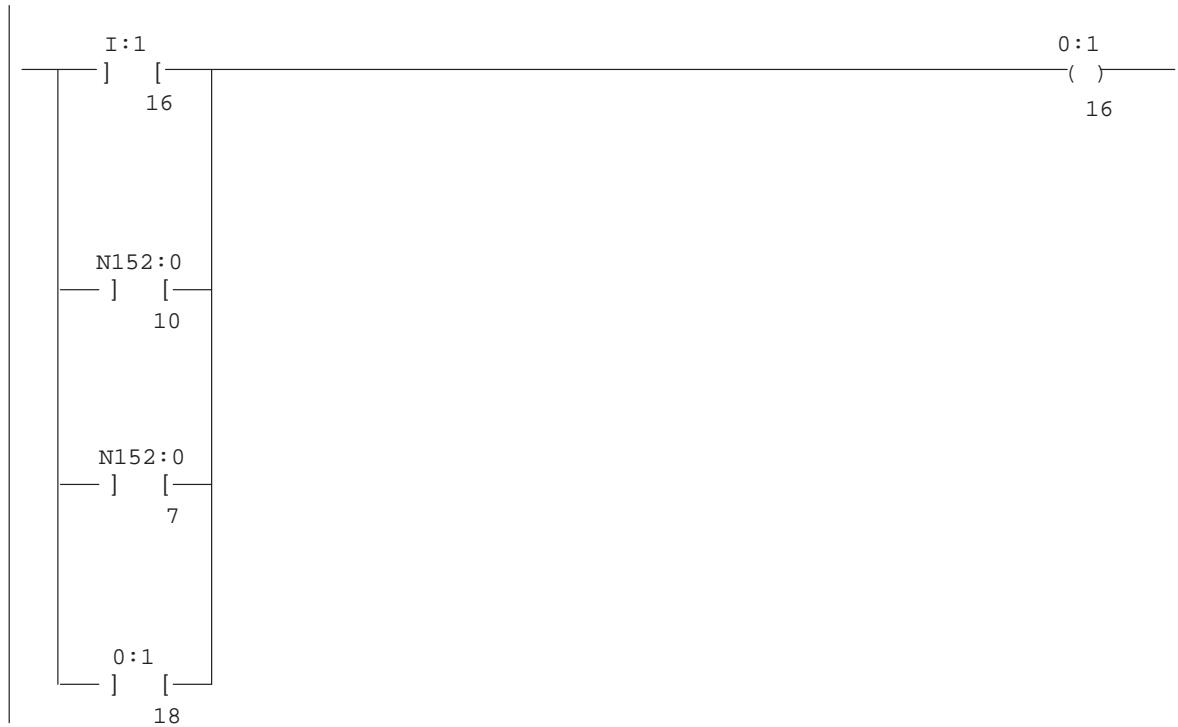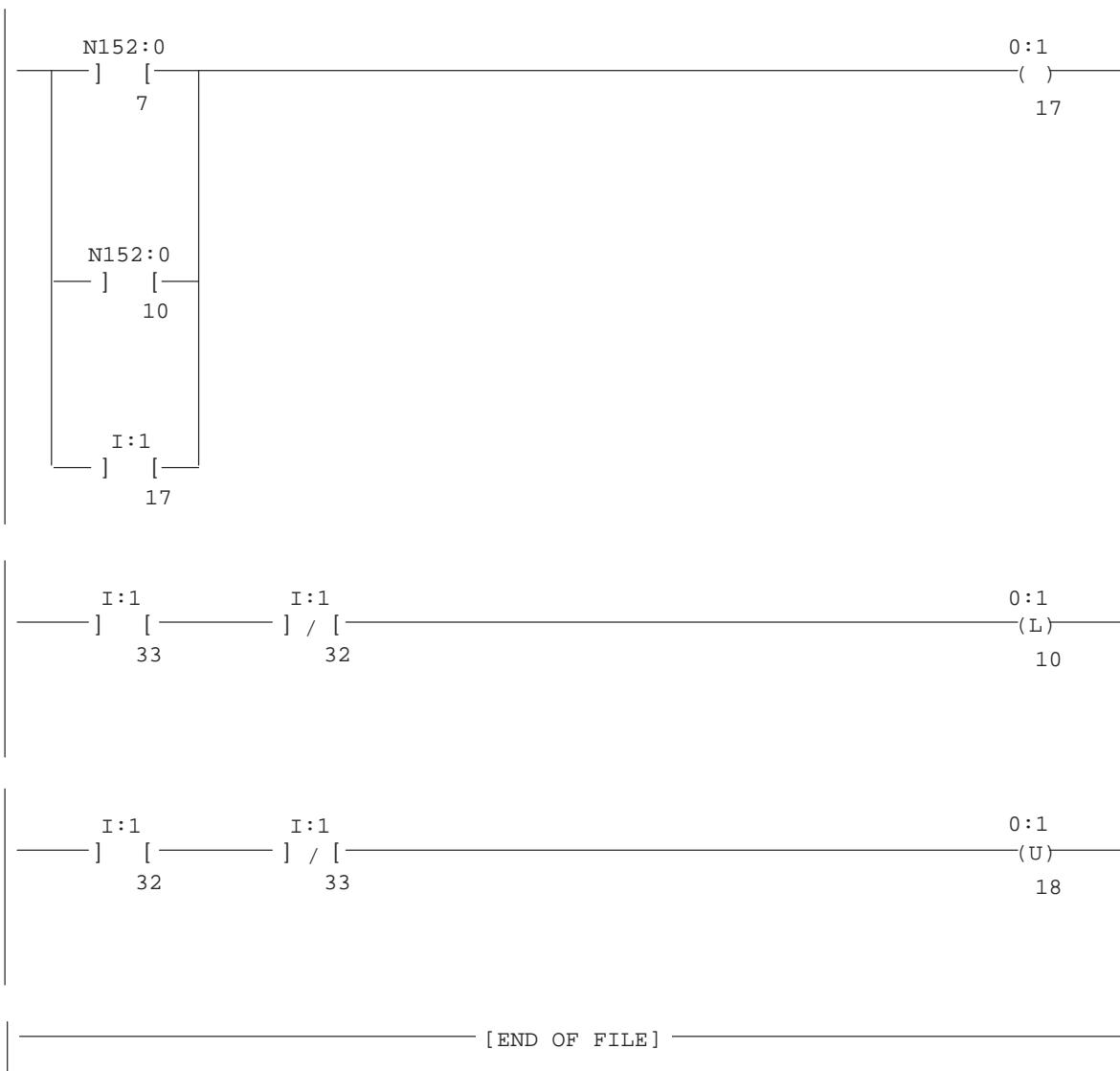
Use the APS Ladder Program as You Perform DeviceNet Control and Diagnostics Examples

Move through the APS ladder program as you perform the following DeviceNet control and diagnostics examples. Read the text descriptions of each rung as you perform these procedures:

Rung 0

This rung turns on when the scanner is put in RUN mode.

1. Toggle the SLC processor keyswitch between RUN and PROGRAM.
- You see the field behind the ladder rung change color

2. Put the processor in RUN mode.
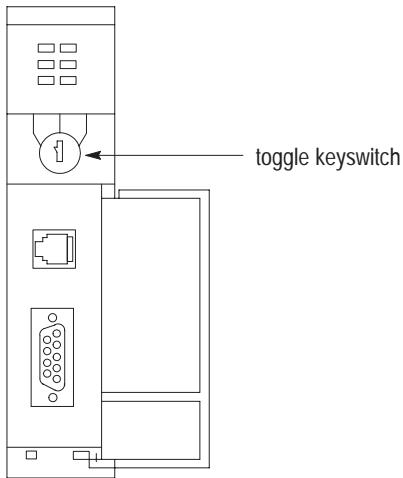
Rung 2

This rung turns on when the red light of the RediSTATION operator interface illuminates and/or blinks.

1. Cursor down to Rung 2, word O:1 bit 16.

2. Activate the limit switch.
- You see the red light on the RediSTATION operator interface illuminate
- You see the field behind the ladder rung (word O:1 bit 16) change color

3. Press [F8] **Data Monitor**.

4. Again, activate the limit switch.
- In the output data table, you can see word O:1 bit 16 changes from 0 to 1
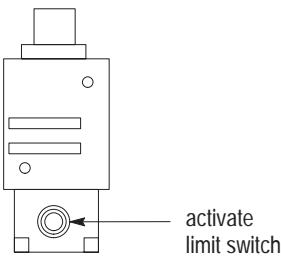
5. Press [Esc] to return to the ladder program.

6. Cursor left to Rung 2, word I:1 bit 6.

7. Place your hand in front of the photoelectric sensor.
- You see the red light on the RediSTATION operator interface illuminate
- You see the field behind the ladder rung (word I:1 bit 16) change color

toggle keyswitch

activate limit switch

place hand in front of photoelectric sensor

place hand in
front of
photoelectric sensor
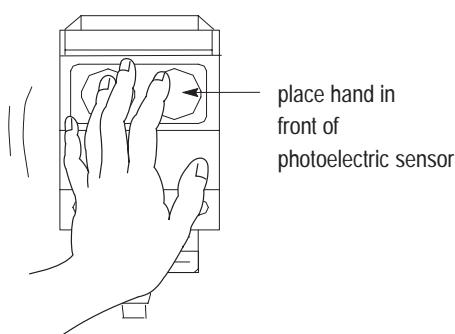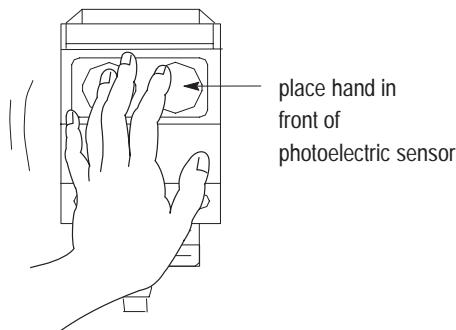
8. Press ⬚F8⬚ **Data Monitor**.

9. Again, place your hand in front of the photoelectric sensor.
   - In the input data table, you can see word I:1 bit 16 changes from 0 to 1

10. Press ⬚Esc⬚ to return to the ladder program.

Rung 3
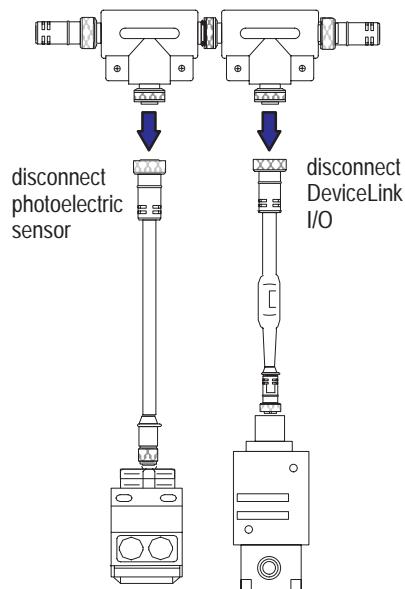
This rung turns on when the DeviceLink I/O and the photoelectric sensor are pulled off of the DeviceNet network, or when the photoelectric sensor is out of margin.

disconnect
photoelectric
sensor

disconnect
DeviceLink
I/O

1. Cursor down to Rung 3, word O:1 bit 17.

2. Pull the DeviceLink I/O and the photoelectric sensor off of the DeviceNet network.
   - You see the red light illuminate and flash
   - You see the fields behind the ladder rungs (word O:1 bit 17) and (word N:152 bit 7) change color

3. Press ⬚F8⬚ **Data Monitor**.

4. Press ⬚F1⬚ **Change Radix**.

5. Press ⬚F1⬚ **Binary Data**.
   - In the integer data table, you can see words 6 and 9 change from 0 to 1

6. Press ⬚Esc⬚ to return to the ladder program.

7. Cursor down to word I:1 bit 17.

8. Put your hand over the photoelectric sensor and slowly pull your hand away (out of margin) from the photoelectric sensor.
   - You see the 800T RediSTATION red light go out
   - You see the photoelectric sensor indicators go out
   - You see the field behind the ladder rung (word I:1 bit 17) change color

pull hand away from
front of photoelectric
sensor
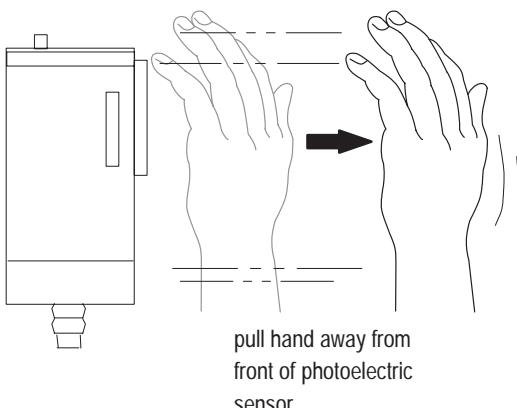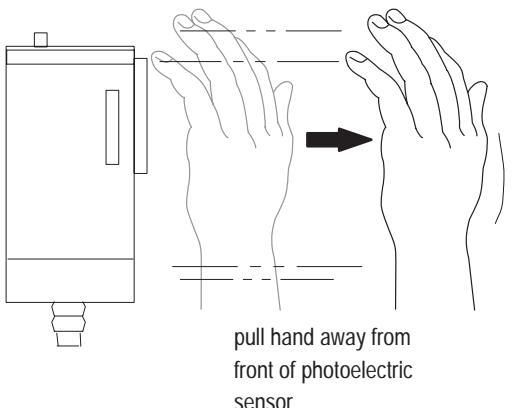
9. Press [F8] **Data Monitor**.

10. Again, place your hand in front of the photoelectric sensor.
- In the input data table, you can see word I:1 bit 17 changes from 0 to 1

11. Again, slowly pull your hand away (out of margin) from the front of the photoelectric sensor.
- In the input data table, you can see word I:1 bit 17 changes back from 1 to 0

pull hand away from front of photoelectric sensor

Rung 4

This rung turns on when the red or green buttons on the RediSTATION operator interface are pushed.
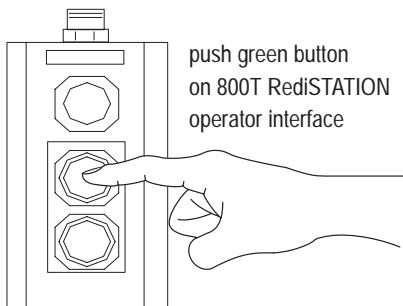
1. Cursor to Rung 4, word I:1 bit 33.

2. Push the green button on the 800T RediSTATION operator interface.
- You see the red light illuminate
- You see the field behind the ladder rung (word I:1 bit 33) change color

push green button on 800T RediSTATION operator interface

3. Press [F8] **Data Monitor**.
- In the input data table, you can see word I:1 bit 33 changes from 0 to 1 each time you push the green button

4. Cursor down to word I:1 bit 32.

5. Push the red button on the 800T RediSTATION operator interface.
- You see the red light go out
- You see the field behind the ladder rung (word I:1 bit 32) change color

push red button on 800T RediSTATION operator interface

6. Press [F8] **Data Monitor**.
- In the input data table, you can see word I:1 bit 32 changes from 0 to 1 each time you push the red button

7. Press [Esc] to return to the ladder program**.**

1. Press [F3] to exit APS.

Summary

In this chapter, you learned how to use APS software with DeviceNet starter kit to perform control and diagnostics:

• create the ladder logic program

• use APS with DeviceNetManager software to perform control and diagnostics examples

Feedback disk

You are done performing the tasks in this user manual. For more information on A-B DeviceNet products, call your local distributor or sales office.

Please remember to complete the survey on the enclosed floppy disk.

DeviceNet ||||

Business Reply Mail

self-addressed return envelope

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