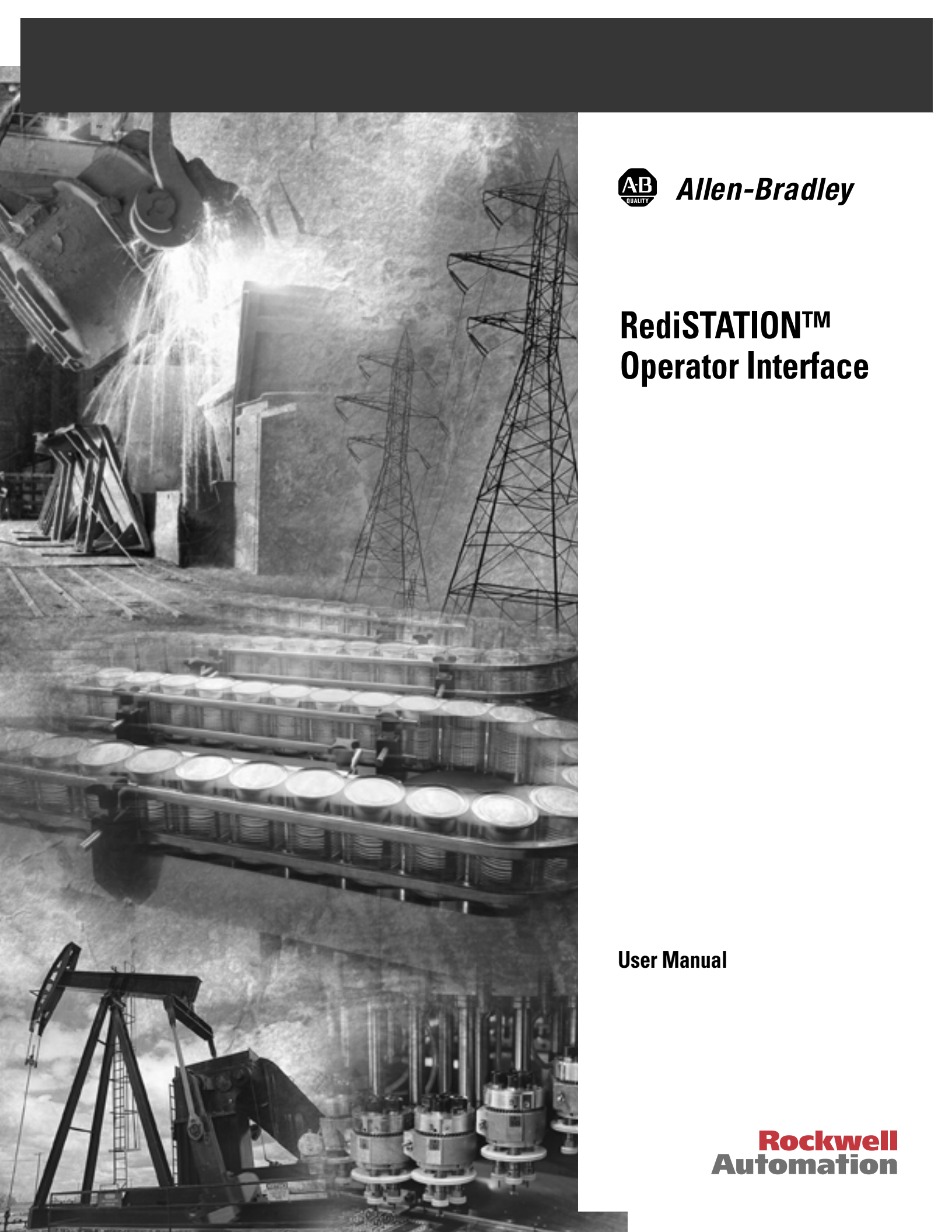




Allen-Bradley

RediSTATION™ Operator Interface

User Manual

**Rockwell
Automation**

Important User Information

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

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

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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

ATTENTION



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

Attention statements help you to:

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

IMPORTANT

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

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Objectives

This manual gives an overview of the Bulletin 2705 RediSTATION operator interface and describes how to configure, install, operate and troubleshoot the device on the DeviceNet network.

Intended Audience

This manual is for the individuals responsible for installing, mounting and operating the RediSTATION in an industrial environment.

You should understand DeviceNet network operations, including how slave devices operate on the network and communicate with a DeviceNet master.

Contents of Manual

Chapter	Title	Description
	Preface	Describes the purpose and contents of the manual, and intended audience.
1	Overview	Gives an overview of the features of the RediSTATION Operator Interface.
2	Installation and Mounting	Shows how to configure, mount and install the RediSTATION on a DeviceNet network.
3	Operations	Describes RediSTATION operations and other pertinent operation.
4	Troubleshooting and Maintenance	Gives information on how to troubleshoot and maintain the RediSTATION.
5	Building Custom Units	Tells how to assemble separate components of a RediSTATION device.
A	Specifications	Gives electrical, mechanical and environmental specifications.
B	DeviceNet Information	Describes DeviceNet message types, class services, and object classes supported by the RediSTATION.
C	Unpopulated Configuration	Describes components and instructions for installing the unpopulated version of the RediSTATION.

Related Publications

The following table lists DeviceNet related publications you might want to refer to.

Publication Title	Publication Number
DeviceNet Cable System Planning and Installation Manual	DN-6.7.2
1771-SDN Scanner Module Installation Instructions	1771-5.14
1747-SDN Scanner Module Installation Instructions	1747-5.8

Overview of RediSTATION

Chapter Objectives

This chapter provides an overview of the RediSTATION and its features. It contains the following sections:

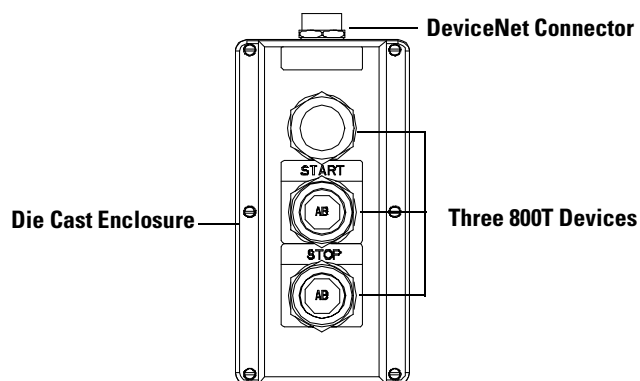
Section	Page
Description	1-2
Standard Configuration	1-2
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DeviceNet Connection	1-7
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Description

The Bulletin 2705 RediStation is a 3-button station that operates on the DeviceNet network. The station receives power from the DeviceNet network. A separate power supply is not required.

The station supports three 800T devices in a standard or custom configuration. The standard unit includes two push buttons and one pilot light that are prewired for easy installation. Custom configurations support a variety of 800T devices that are prewired or customer installed.

The die cast enclosure of the standard unit complies with NEMA Type 4/12/13 standards for operation in rugged industrial environments.



Summary of Features

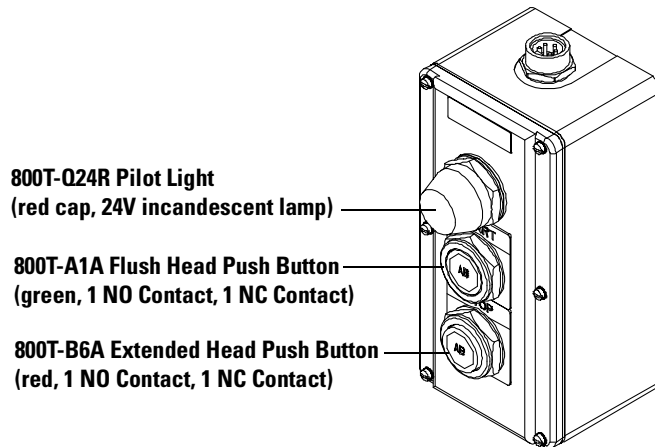
- Standard or custom configurations
- Surface mounting device
- NEMA Type 4/12/13 die cast enclosure
- Easy installation and startup
- DeviceNet compatibility
- Powered by DeviceNet connection (no power supply required)
- Mod/Net Status LED provides indication of network and device operation

Standard Configuration

The standard RediSTATION unit (Catalog No. 2705-T3DN1A42A) has 2 push buttons (start and stop) and 1 pilot light.

- Catalog No. 800T-A1A Flush Head Push Button
- Catalog No. 800T-B6A Extended Head Push Button
- Catalog No. 800T-Q24R Pilot Light

The devices are prewired.

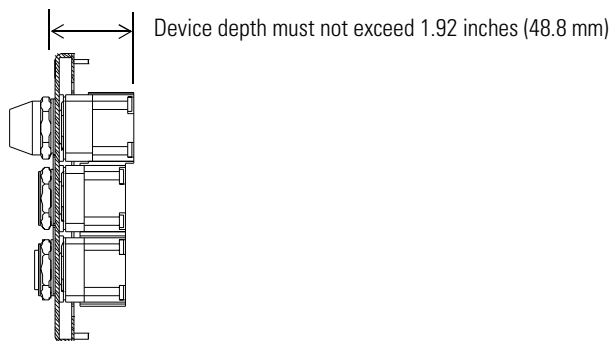


Custom Configurations

You can order custom configurations to include other 800T devices that are prewired or customer installed. The RediSTATION supports direct connection to shallow contact blocks and 24 VDC incandescent lamps:

- push buttons, illuminated/non-illuminated
- selector switches, illuminated/non-illuminated
- key switches
- pilot lights

Other 800T devices are supported if the depth of the device is less than 1.92 inches (48.8 mm). Measure the device from the front mounting surface to the back of the 800T device.



Unpopulated Configuration

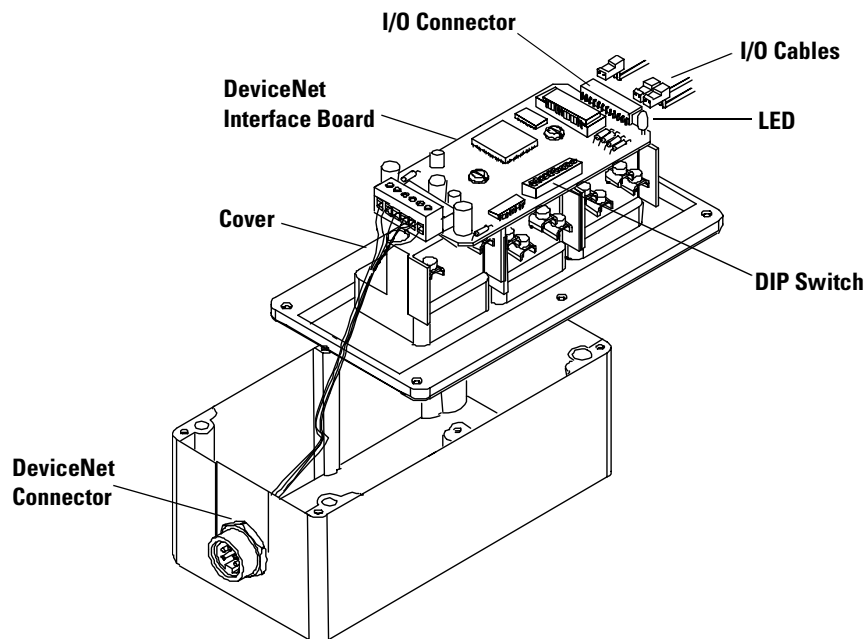
An unpopulated configuration is available for customer configuration and installation of operator devices. The unpopulated configuration includes:

- DeviceNet Interface Board
- Six I/O Connector Cables (supporting 4 inputs and 2 outputs)
- DeviceNet PCB Terminal Block
- Mounting Hardware

Refer to Appendix C.

Station Features

RediSTATION features are visible when the cover of the enclosure is removed.



LED Indicator

The RediSTATION has one bicolor LED (red/green) to show its operating status. The LED shows the following indications.

Color	State	Indication
None	Off	No power
Red	Solid	Unrecoverable fault
	Flashing	Output error or configuration error
Green	Solid	Normal runtime operation The RediSTATION device is operating as a slave to the master controller.
	Flashing	Device is idle or not allocated to a master.

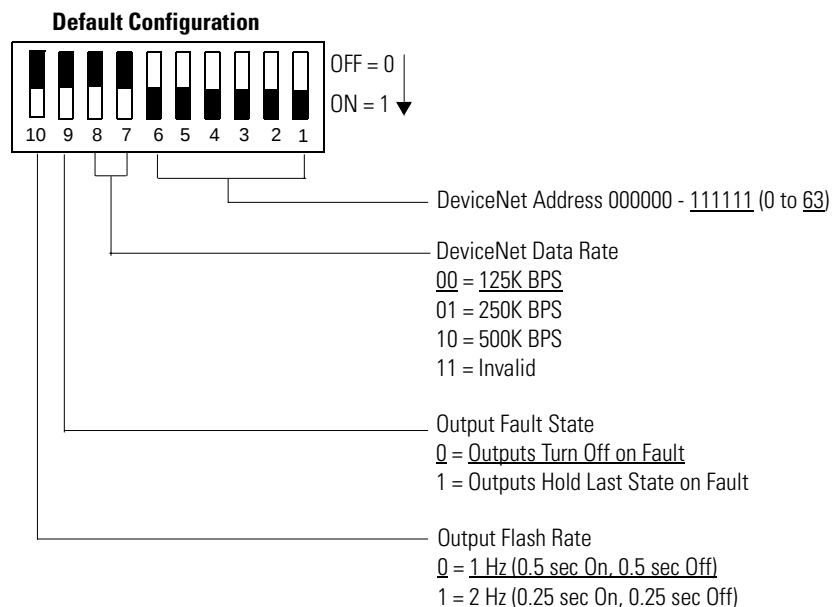
The LED is visible when the cover of the enclosure is removed.

DIP Switches

The RediSTATION has one 10-position DIP switch for setting:

- DeviceNet Node Address
- DeviceNet Data Rate
- Output Fault State (Off or Last State)
- Output Flash Rate

The DIP switch is located on the circuit board inside the enclosure. The switch settings and functions are shown below. The default setting for each switch or group of switches is underlined.



I/O Connector

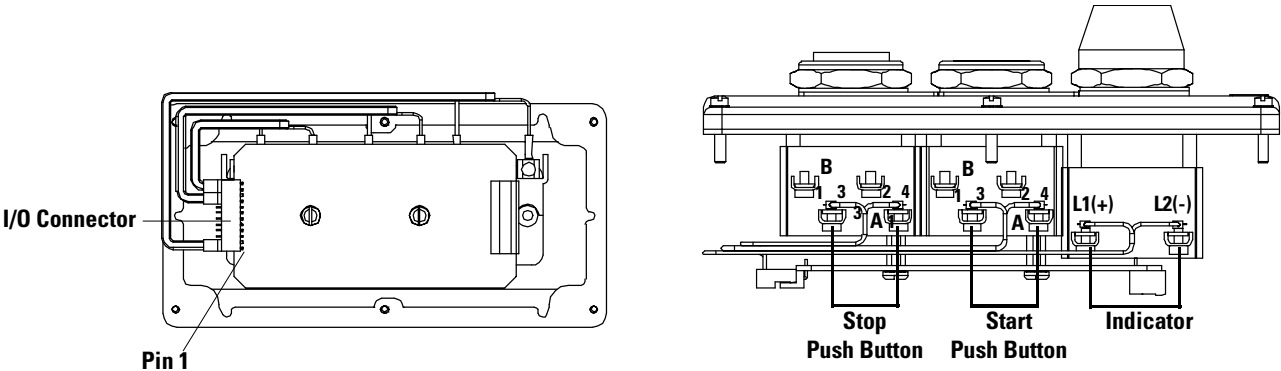
Bulletin 800T devices connect to the 12-pin I/O connector on the circuit board. The connector supports 4 inputs and 2 outputs. The standard configuration uses 2 inputs and 1 output.

A separate cable attaches each 800T input or output device to the I/O connector. The 2-wire end of the cable attaches to the screw terminals of the device. The connector end of the cable connects to 2-pins on the I/O connector. Unused pins are left open.

The table below shows connections for the standard configuration. The pilot light connects to pins 1-2. The start push button connects to pins 9-10. The stop push button connects to pins 11-12. Pins 3-8 are unused.

I/O Connector Pin#	Wire Color	800T Terminal Labels	800T Device
1	Red	L1(+)	Indicator
2	Black	L2(-)	
9	Red	A3	Start Push Button
10	Black	A4	
11	Red	A3	Stop Push Button
12	Black	A4	

The illustration on the left shows the location of the I/O connector on the circuit board. The illustration on the right shows the terminal labels for each device in the standard configuration.



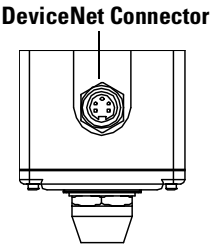
Device Connection

The RediSTATION receives all power and communications through the DeviceNet cable. A separate power supply is not required. This is the only external connection to the RediSTATION.

The RediSTATION connects to the DeviceNet network using either the sealed connector on the top of the unit or the DeviceNet terminal block inside the enclosure.

DeviceNet Sealed Connector

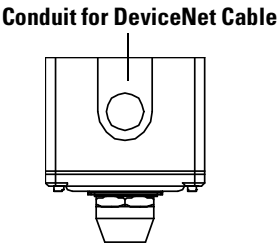
On standard units, the DeviceNet cable attaches directly to the DeviceNet connector at the top of the enclosure. The connector is wired to the DeviceNet terminal block on the circuit board.



DeviceNet Connector	Pin #	Signal	Function	Color
	1	SHIELD	Shield	Green
	2	VDC+	Power Supply	Red
	3	COM	Common	Black
	4	CAN_H	Signal High	White
	5	CAN_L	Signal Low	Blue

DeviceNet Terminal Block

On stations without a sealed connector, DeviceNet cable wires (2 communication, 2 power, 1 shield) connect to the terminal block through the conduit at the top of the unit.



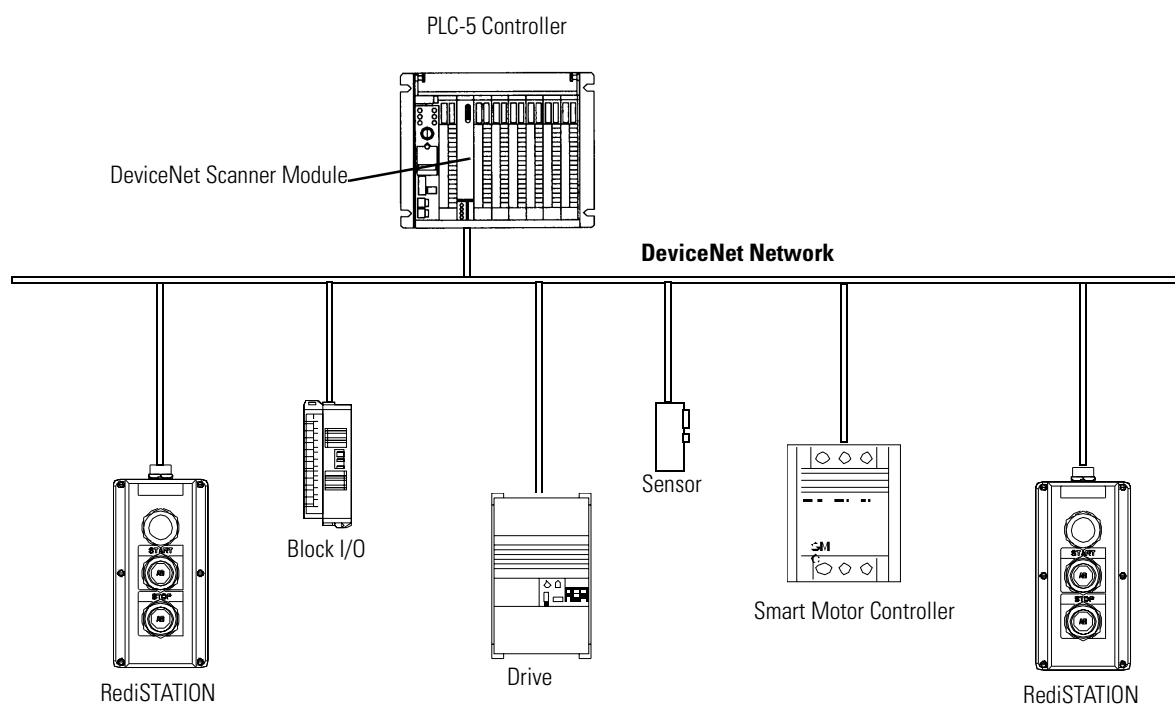
DeviceNet Terminal Block	Pin #	Signal	Function	Color
	1	COM	Common	Black
	2	CAN_L	Signal Low	Blue
	3	SHIELD	Shield	Uninsulated
	4	CAN_H	Signal High	White
	5	VDC+	Power Supply	Red
	6	E. GND	Chassis Ground	Green

Typical DeviceNet Configuration

A DeviceNet network supports multiple RediSTATION devices and allows them to communicate with other network devices (up to 64).

The RediSTATION operates on the network as a slave device. It does not initiate communications except for a duplicate node address check on powerup. The master reads inputs from RediSTATION input devices and writes data to the output devices.

The following DeviceNet configuration shows a variety of sensors operating as slaves to a PLC-5 controller with a 1771-SDN DeviceNet Scanner Module.



DeviceNet Components

DeviceNet cables and components are available from Allen–Bradley as separate catalog numbers.

It is your responsibility to install and implement the DeviceNet network and supported devices according to the DeviceNet guidelines.

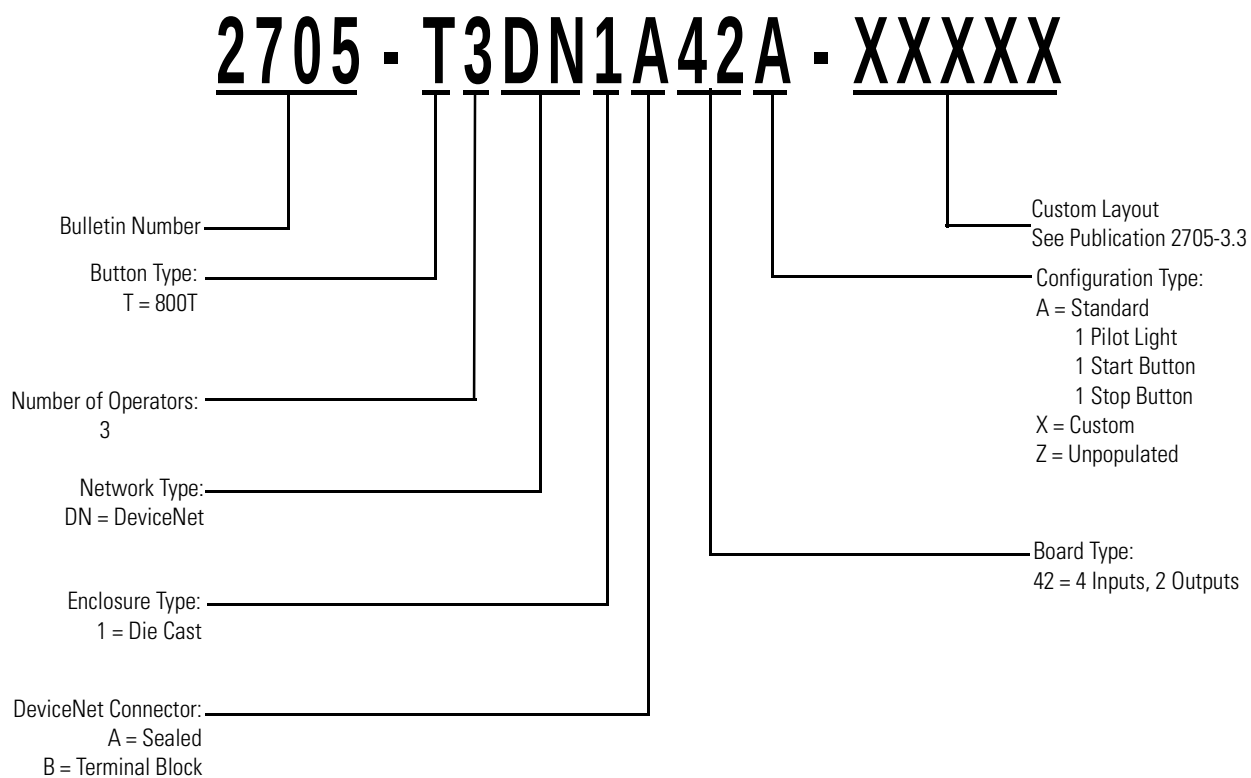
Replacement Parts

The Standard RediSTATION unit is completely assembled and does not have accessories.

Replacement parts for 800T components (operators, pilot lights, legend plates) are available as separate catalog numbers.

Catalog Number Configuration

The following catalog number configuration shows how to order standard or custom built RediSTATION units.



Installation and Mounting

Chapter Objectives

This chapter describes how to install and mount a standard or custom RediSTATION. It contains the following sections:

Section	Page
DeviceNet Guidelines	2-1
Equipment Needed	2-1
Removing the Enclosure Cover	2-2
Setting the DIP Switches	2-2
DeviceNet Termination	2-5
RediSTATION Dimensions	2-6
Mounting the RediSTATION	2-7
Securing the Enclosure Cover	2-8
Connecting to a DeviceNet Network	2-9

DeviceNet Guidelines

It is your responsibility to install and implement the DeviceNet network and supported devices according to the DeviceNet guidelines.

Equipment Needed

Install the RediSTATION using standard electricians tools.

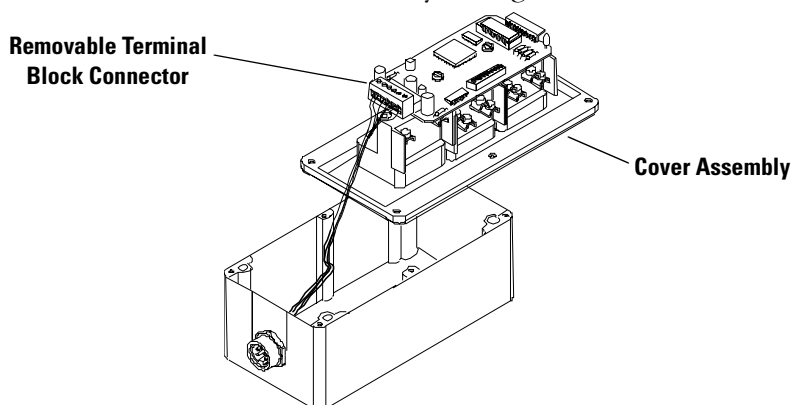
- Wire strippers
- Slotted screwdriver

Removing the Enclosure Cover

To set the configuration parameters of the RediSTATION and mount the enclosure, you must remove the enclosure cover.

To remove the enclosure cover:

1. Using a slotted screwdriver, remove the 6 cover screws.
2. Carefully remove the cover so as not to disconnect any wires.
3. Remove the DeviceNet terminal block connector from the circuit board. Do not disconnect any wiring.



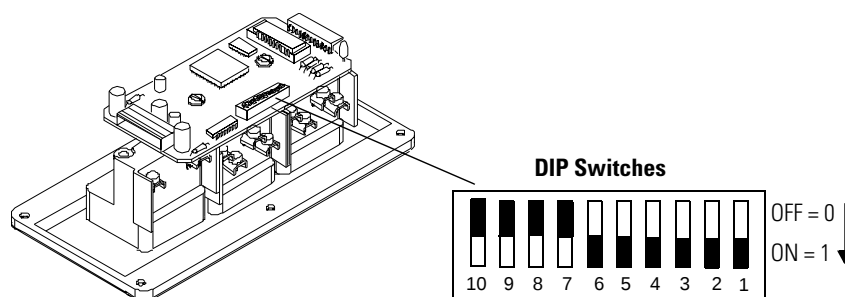
4. Store the enclosure cover in a safe location; it is not required for mounting the enclosure.

Setting the DIP Switches

The setting of the DIP switch on the circuit board determines:

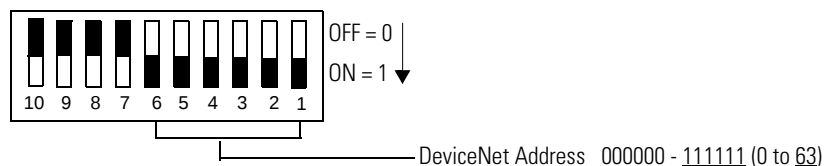
- DeviceNet node address
- DeviceNet data rate
- Output fault state
- Output flash rate

The location of the DIP switch and the factory defaults are shown below.



Setting the DeviceNet Node Address

DIP switches 1 to 6 set the node address (0 to 63) of the RediSTATION on the DeviceNet network. The address is set using binary addressing.



The table below shows the switch settings for each address (0 to 63).

To set the DeviceNet node address:

1. Refer to the table below for switch settings of a specific address.
2. Using your finger or a pointed object, slide switches 1 to 6 to the appropriate ON/OFF positions.

ATTENTION

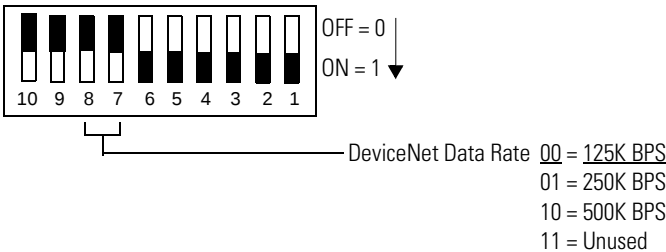
Do not use a pencil. Graphite from the pencil is conductive and may damage DIP Switch.



DeviceNet Address	Switch Settings 6 ← 1	DeviceNet Address	Switch Settings 6 ← 1	DeviceNet Address	Switch Settings 6 ← 1	DeviceNet Address	Switch Settings 6 ← 1
0	000000	16	010000	32	100000	48	110000
1	000001	17	010001	33	100001	49	110001
2	000010	18	010010	34	100010	50	110010
3	000011	19	010011	35	100011	51	110011
4	000100	20	010100	36	100100	52	110100
5	000101	21	010101	37	100101	53	110101
6	000110	22	010110	38	100110	54	110110
7	000111	23	010111	39	100111	55	110111
8	001000	24	011000	40	101000	56	111000
9	001001	25	011001	41	101001	57	111001
10	001010	26	011010	42	101010	58	111010
11	001011	27	011011	43	101011	59	111011
12	001100	28	011100	44	101100	60	111100
13	001101	29	011101	45	101101	61	111101
14	001110	30	011110	46	101110	62	111110
15	001111	31	011111	47	101111	63	111111

Setting the Data Rate

DIP switches 7 and 8 set the data rate at which the RediSTATION communicates on the DeviceNet network. The factory default is 125K.



The data rate determines the maximum length of the DeviceNet cable.

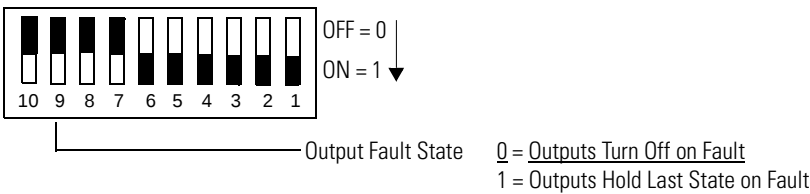
Data Rate	Cable Length (Maximum)
125K BPS	500 meters (1600 feet)
250K BPS	200 meters (600 feet)
500K BPS	100 meters (300 feet)

To set the DeviceNet data rate:

- 1. Refer to the table above to select the correct data rate.
- 2. Slide switches 7 and 8 to the appropriate ON/OFF positions.

Setting the Output Fault State

DIP switch 9 sets the state of the outputs (pilot lights) when the device detects an error. The factory default setting is to turn the outputs off when an error is detected. The station ignores push button presses in the error state. When communication is regained, the station updates itself and resumes operation.

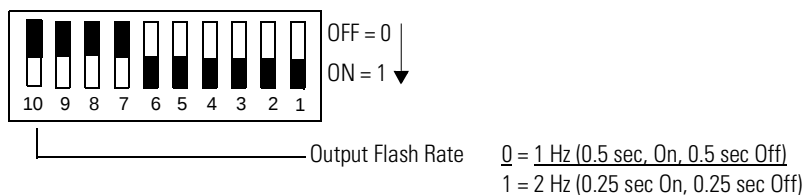


Output Fault States	Description
Outputs Turn Off on Error	When communication is lost, the station turns off outputs.
Outputs Retain Last State	When communication is lost, the outputs remain in their last state.

To change the fault state, slide switch 9 to the correct ON/OFF setting.

Setting the Output Flash Rate

DIP switch 10 sets the flash rate of the outputs (pilot lights). The factory default setting is 1 Hz.

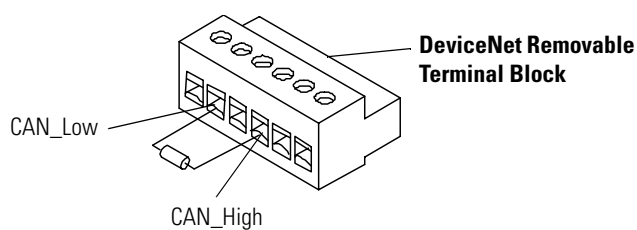


To change the flash rate, slide switch 10 to the appropriate ON/OFF position.

DeviceNet Termination

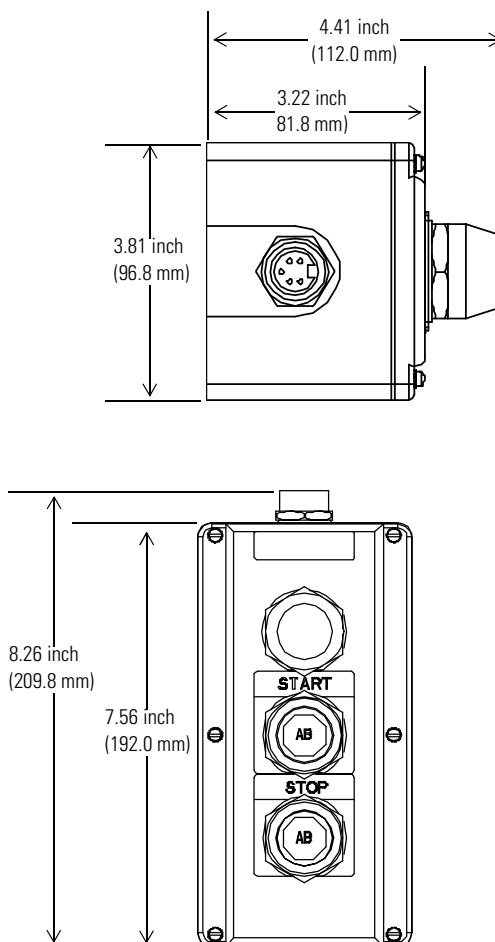
Devices on end nodes of the DeviceNet network require termination. If the RediSTATION is an end node, you must provide network termination.

To terminate the RediSTATION, install a 121 ohm 1% metal film resistor between the CAN_High and CAN_Low terminals on the DeviceNet terminal block.



RediSTATION Dimensions

The figure below shows the dimensions of the standard RediSTATION. For custom built stations, the depth may vary depending upon the 800T operators or pilot lights installed.

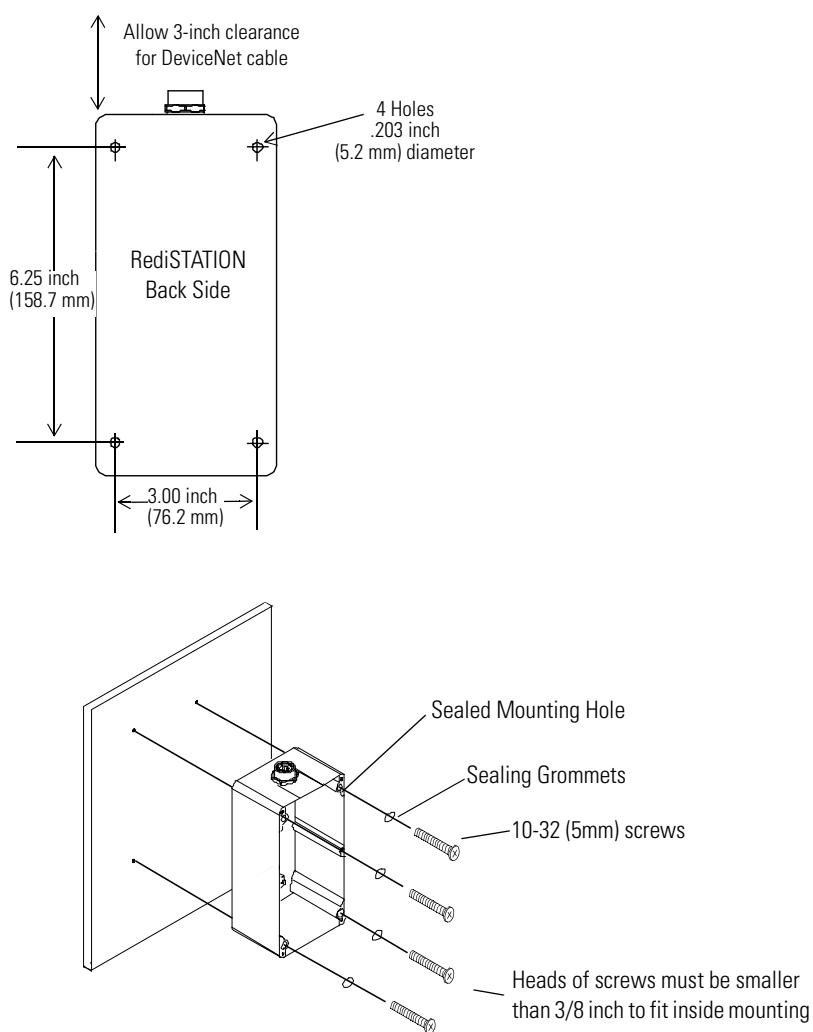


Mounting the RediSTATION

The RediSTATION mounts on a flat surface. The back of the unit has 4 holes that accept a 10-32 (5mm) screw. To maintain a watertight seal, use sealing grommets with screws. The screw length must be 1/2 inch (12.7 mm) plus the depth of the material into which the screw is mounted. The head of the screws must be 3/8 inch or less to fit in the sealed mounting holes.

For proper grounding, mount the enclosure to a grounded metal plate. Scrape the paint around the screw holes of the enclosure and plate to ensure good metal-to-metal contact.

Allow a clearance of at least 3 inches (76.2 mm) at the top of the enclosure for connecting the DeviceNet cable.

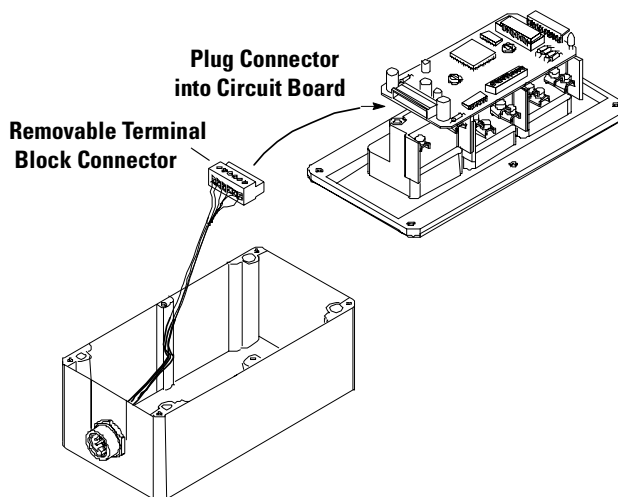


Securing Enclosure Cover

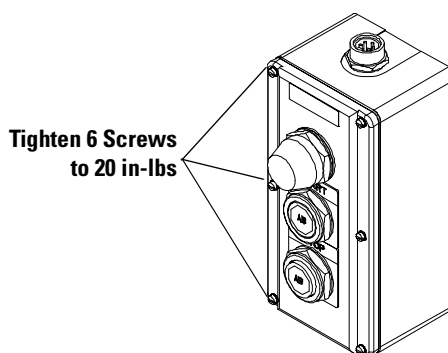
After setting the DIP switches and mounting the enclosure, secure the cover of the enclosure.

To secure the enclosure cover:

1. Plug the DeviceNet terminal block connector into the circuit board.

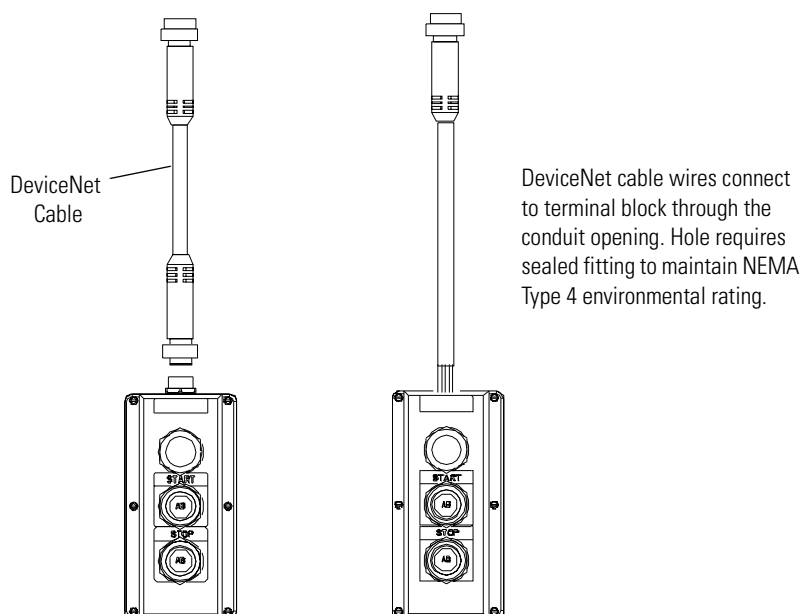


2. Secure the cover of the enclosure with the six cover screws. Tighten screws to 20 in-lbs to ensure proper seal.



Connecting to the DeviceNet Network

On standard units with the sealed connector, it is not necessary to disconnect incoming power from DeviceNet network before connecting the RediStation. The DeviceNet cable connects directly to the connector on the top of the enclosure or through the conduit opening.



Important: When connecting conduit to the enclosure, use UL listed or recognized conduit hubs with the same environmental rating as the enclosure.

Operations

Chapter Objectives

This chapter contains the following sections:

Section	Page
Modes of Operations	3-1
Resetting the Device	3-3
DeviceNet Operations	3-4

Modes of Operation

The RediSTATION has 4 modes of operations: Powerup / Reset Mode, Idle Mode, Run Mode, and Error Mode.

Powerup/Reset Mode

During a powerup or reset, the RediSTATION:

1. Clears outputs (turns outputs off) and cycles the LED indicator through solid red, green and off. The LED remains off until the test is completed.
2. Performs powerup diagnostic tests including:
 - EPROM checksum test
 - RAM read/write test
 - Watchdog timer test
 - Serial number verification

If any test fails, the outputs remain off and the LED shows solid red. You must cycle power to recover from a powerup diagnostic test failure. Repeated failures indicate a faulty unit.

3. Reads and stores the DIP switch settings.

Important: Changes to DIP switch settings are allowed only in powerup or reset mode. Changes to DIP switch settings under power cause an error.

4. Performs a duplicate node address check to verify that another node is not assigned the same DeviceNet address as the RediSTATION device. If a duplicate node error occurs, the outputs turn off and the status LED is set to red. You must cycle power to clear the error.

Idle Mode

If the powerup or reset is successful, the RediSTATION enters idle mode and the LED flashes green. When the RediSTATION establishes a connection with a master device, it enters run mode (LED is solid green).

Run Mode

After a successful powerup or reset, the RediSTATION enters run mode and operates as a slave to a master device. In run mode, the:

- controller scans switch inputs and writes lamp outputs.
- station accepts output messages and poll messages from other nodes on the DeviceNet network.
- station monitors outputs for underloads/overloads.

If an output error is detected, the RediSTATION sets the appropriate message bits and remains in run mode.

In run mode, you can set the outputs to on, off or flashing.

DIP switch 10 controls the rate of flashing for outputs.

The RediSTATION also supports DeviceNet explicit messages that are received over the network. Explicit messages are used to configure and verify RediSTATION settings.

If all connections with the master device are closed or deleted (timed out), the RediSTATION returns to idle mode. An explicit connection with an Expected Packet Rate (EPR) value of 0 never times out.

Error Mode

In error mode (LED turns red), the RediSTATION monitors the error state for correct operation. Errors are critical or noncritical.

Error Type	Description	LED State
Critical (Not recoverable)	Failure of diagnostic tests during powerup/reset mode	Solid Red
	Over-temperature condition of outputs during runtime	
	Changes to DIP switches during runtime	
	Duplicate node address detected	
	Incorrect data rate	
Non-critical (Recoverable)	Pilot lamp burned out	Flashing Red
	Pilot lamp wired incorrectly	
	I/O connection timeout	

See the troubleshooting chart on page 4-2 for details on how to recover from an error.

Resetting the Device

To reset the RediSTATION, you must cycle power to the unit or briefly disconnect the DeviceNet connector.

DeviceNet Operations

The Allen-Bradley 1747-SDN and 1771-SDN DeviceNet Scanner Modules are master devices on the DeviceNet network. The RediSTATION supports the Master/Slave Connection Set for master/slave communications on the DeviceNet network.

To communicate with a RediSTATION, the DeviceNet Scanner Module must be configured with the RediSTATION:

- node address
- input bytes (1)
- output bytes (1)

The DeviceNet Scanner Module:

- connects to the RediSTATION slave device
- performs the appropriate connection configuration
- polls the RediSTATION for inputs and outputs

Response Times

The RediSTATION responds to a DeviceNet Scanner poll within 1 millisecond.

The switch inputs are debounced for 50 milliseconds. When a change of state is detected, the inputs are not read for another 50 milliseconds

Troubleshooting and Maintenance

Chapter Objectives

This chapter contains the following sections:

Section	Page
Preventive Maintenance	4-1
Using the LED Indicator	4-2
Replacing RediSTATION devices	4-3
Replacing a Pilot Lamp	4-5

Preventive Maintenance

- Prevent accumulation of dust and dirt by keeping
 - enclosure clean
 - enclosure covered
- Periodically check for loose connections.

ATTENTION

To avoid shock hazard, remove incoming power before checking connections.

Using the LED Indicator

The LED provides status information on RediSTATION operations. The LED is visible when the enclosure cover is removed.

The troubleshooting chart shows LED indications. It also shows how to use the LED to detect and correct common operating problems.

LED		Meaning	What to do
Color	State		
None		RediSTATION not receiving input power.	Check DeviceNet power/cable connections and check the power connection on the DeviceNet terminal block. See page 1-7.
Red	Solid	Diagnostics failed on powerup/reset.	Internal fault. Reset device. If fault persists, return RediSTATION for repair.
		DIP switch settings changed after powerup. DIP switch settings are read only during a powerup or a reset.	Power off the RediSTATION. Set DIP switch settings. Turn power on.
		Over-temperature error detected during runtime. Outputs turn off.	Check ambient temperature rating. Reset device.
		Invalid data rate	Reset DIP switches 7 and 8 to a valid DeviceNet data rate. See page 2-4 for valid data rates and cable lengths. Reset device.
		Duplicate DeviceNet node address. Two nodes cannot have the same address.	Reset DIP switches 1 through 6 using a valid address. See page 2-3 for a table of possible address settings. Reset device.
Red	Flashing	Plot light lamp is burnt out.	Replace pilot lamp bulb.
		Pilot light is not wired correctly to the I/O connector or the screw terminals of the device.	Check I/O cable connections for the pilot light.
		I/O connection timeout	Reset Device.
Green	Solid	Normal operating state and device is allocated to a master device.	No action required.
Green	Flashing	Device is online but not allocated to a master.	Check DeviceNet master for correct RediSTATION configuration information (node address, input bytes, output bytes).
		Device is in idle state.	Check DeviceNet master for proper operation.

The LED does not indicate the following malfunctions.

Problem	Meaning	What to do
Switch or button operators do not function	Loose wiring	Check wiring and cable connections.
	Incorrect address	Check address setting of the DIP switch.
	Faulty contacts, switch or button	Use an ohmmeter to verify opening/closing of contacts.

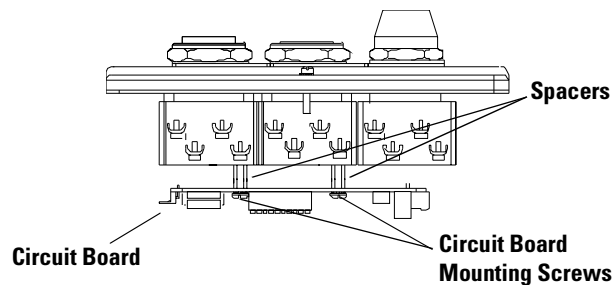
Replacing RediSTATION devices

ATTENTION

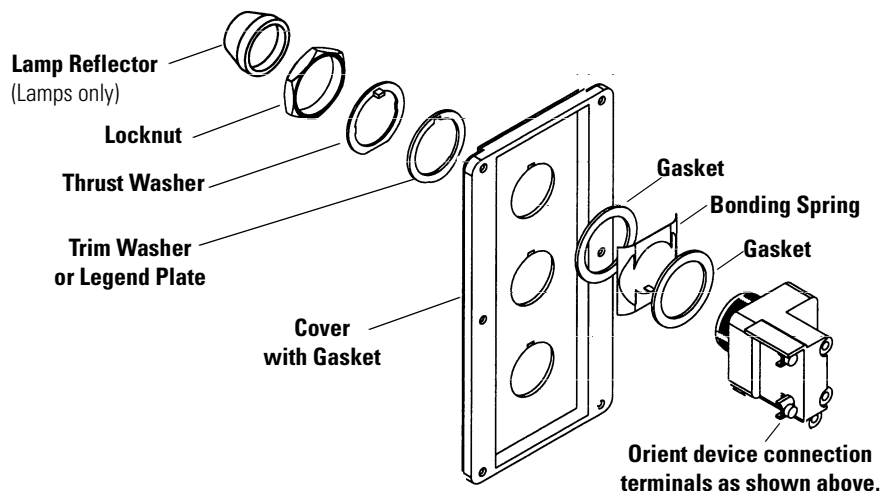
To avoid electrical shock or unintended operation of the equipment, remove power before servicing.

To replace a RediSTATION device:

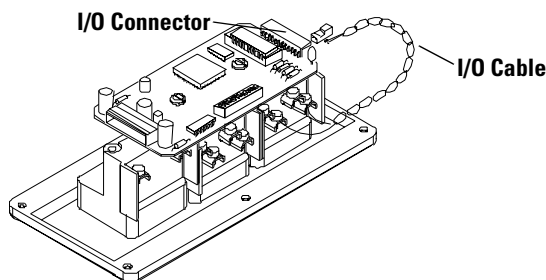
1. Remove the (6) enclosure cover screws.
2. Disconnect DeviceNet terminal block connector from the circuit board.
3. Remove circuit board from back of the 800T devices. Remove the 2 circuit board screws and spacers.



4. Disconnect wiring for the device you want to replace.
5. Remove device from enclosure cover.
6. Mount the replacement 800T device to the enclosure cover. Refer to the instruction sheet that accompanies each device for mounting instructions. All devices should have connection terminals on the same side.



7. Mount the circuit board to the back of the 800T devices with the DeviceNet terminal block oriented toward sealed connector/ conduit hole of enclosure. Use the 2 screws and plastic spacers. Tighten circuit board mounting screws to 14 in-lbs.
8. Connect the 800T device terminals to the I/O connector using an I/O cable. An I/O cable consists of a twisted wire pair. Each set of contacts or pilot light connects to an I/O cable. See page 1-6 for a description of the I/O connector.



ATTENTION



Do not connect I/O pins to external devices or control circuits. Connecting pins to these devices will damage the circuit board.

9. Plug the DeviceNet terminal block connector into the circuit board.
10. Secure cover with the 6 mounting screws. Tighten screws to 20-in lbs.

Replacing a Pilot Lamp Light

Pilot light lamps can be replaced easily without opening enclosure.

To replace a pilot light lamp:

ATTENTION

To avoid electrical shock or unintended operation of the equipment, remove power.



-
1. Remove lens cap from the pilot light.
 2. Remove lamp from socket.

ATTENTION

Do not use a screwdriver or other metal object to remove lamp.



-
3. Carefully insert new lamp in socket.

ATTENTION

Before replacing the lens cap, be sure the lamp is seated properly or a short may result.



-
4. Replace the lens cap.
 5. Check for proper operation.

Building a Custom RediSTATION

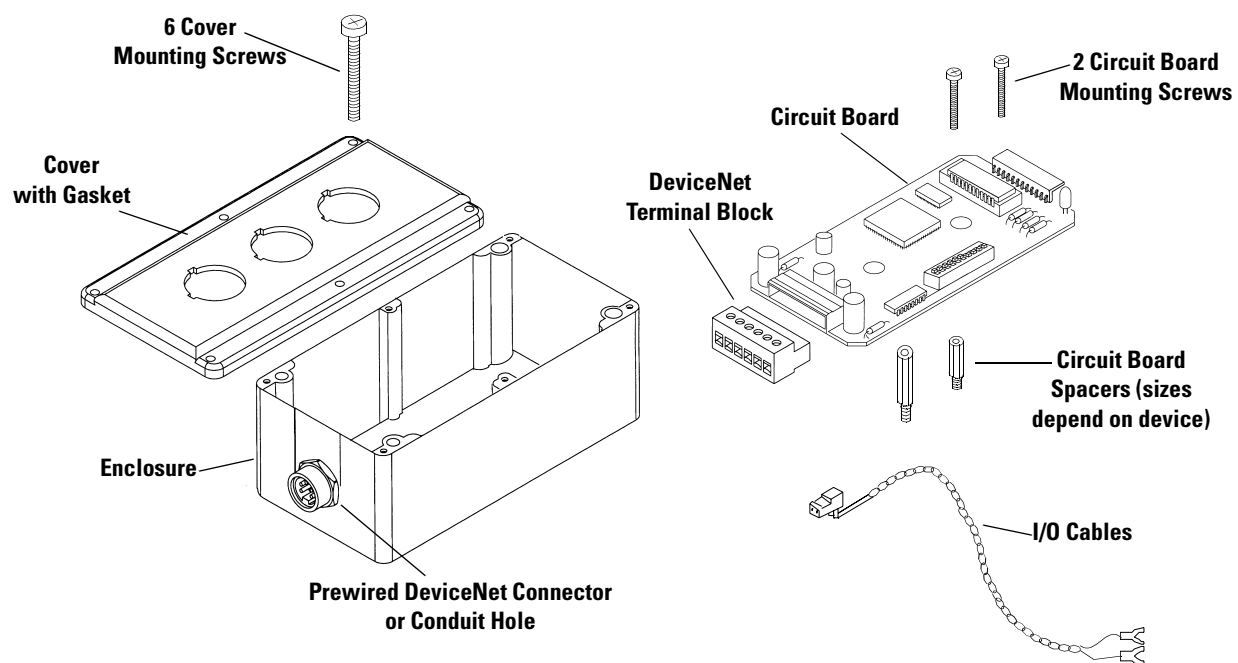
Chapter Objectives

This chapter describes how to create a RediSTATION.

Section	Page
Custom Build Components	5-1
Operators and Indicators	5-2
Assembling the RediSTATION	5-3

Custom Build Components

RediSTATION components can be ordered separately and customer installed. 800T operators and indicators must be purchased separately.



Operators and Indicators

The RediSTATION supports all Allen-Bradley 800T operators and pilot lights including:

- maintained push buttons, illuminated, non-illuminated
- momentary push buttons, illuminated, non-illuminated
- interlocked push buttons, illuminated, non-illuminated
- push pull buttons, illuminated, non-illuminated
- selector switches, illuminated, non-illuminated
- pilot lights
- 2-3-4 way toggle switches

All pilot lights must be rated for 24 VDC.

ATTENTION

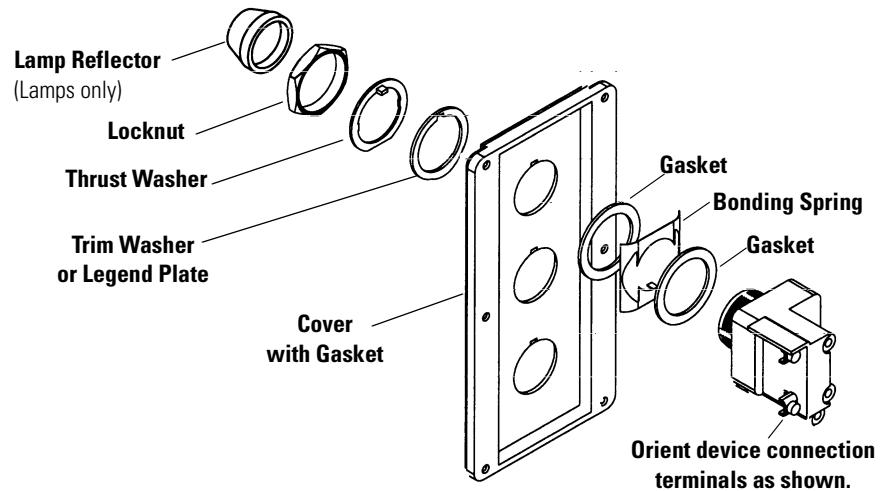


Use only Allen-Bradley 800T devices in the RediSTATION. 800T devices maintain the NEMA rating of the enclosure and allow for proper installation of the circuit board.

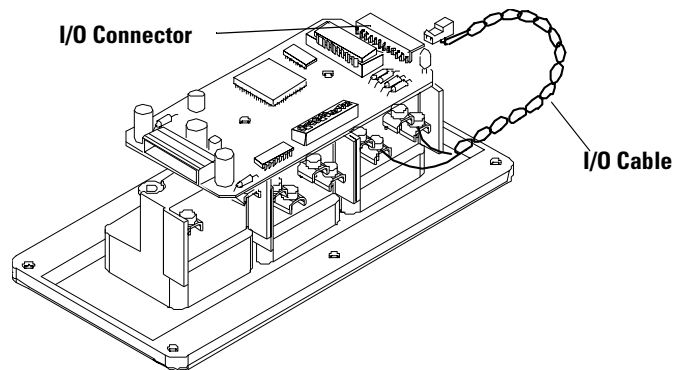
Assembling the RediSTATION

To assemble a RediSTATION device:

1. Mount the 800T devices to the enclosure cover. Refer to the instruction sheet that accompanies each device for mounting instructions. All of the devices should have the connection terminals on the same side.



2. Connect the 800T device terminals to the I/O connector using the I/O cables. An I/O cable consists of a twisted (red/black) wire pair. Each set of contacts or pilot light connects to an I/O cable.

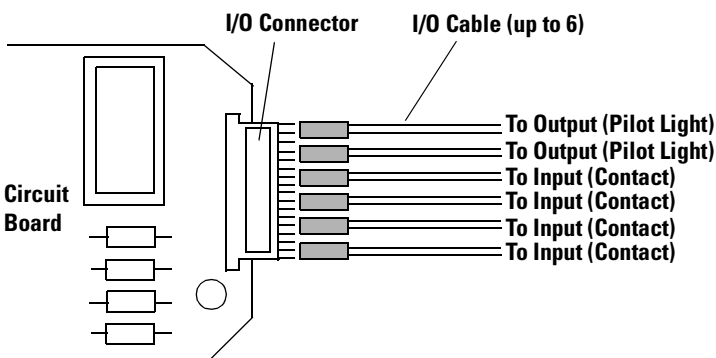


ATTENTION

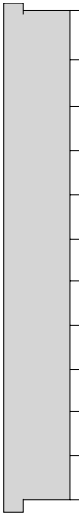


Do not connect I/O pins to external devices or control circuits. Connecting pins to these devices will damage the circuit board.

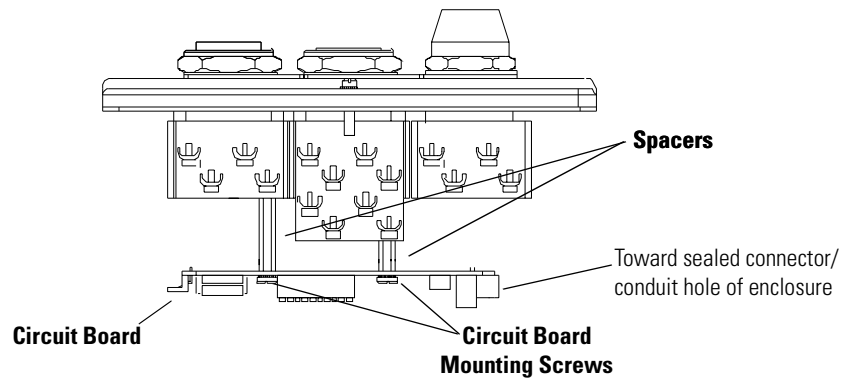
Every 2 consecutive pins on the I/O connector connects to an I/O cable connector. The I/O connector supports 2 outputs/4 inputs.



To simplify wiring, input devices and output devices attach to opposite ends of the I/O connector. The following table defines pin functions on the I/O connector. Output devices connect to pin 1-2 and 3-4. Input devices connect to pins 5-6, 7-8, 9-10 and 11-12. Unused pins are left open.

I/O Connector	Pin #	Pin Label	Function
	1	OUT1+	Connects Output Device
	2	OUT1-	
	3	OUT2+	Connects Output Device
	4	OUT2-	
	5	IN4+	Connects Input Device
	6	IN4-	
	7	IN3+	Connects Input Device
	8	IN3-	
	9	IN2+	Connects Input Device
	10	IN2-	
	11	IN1+	Connects Input Device
	12	IN1-	

3. Mount the circuit board to the back of the 800T devices with the DeviceNet terminal block oriented toward sealed connector/conduit hole of enclosure. Use the two screws and plastic spacers provided (2 sizes provided for different 800T device depths). Tighten circuit board mounting screws to 14 in-lbs.



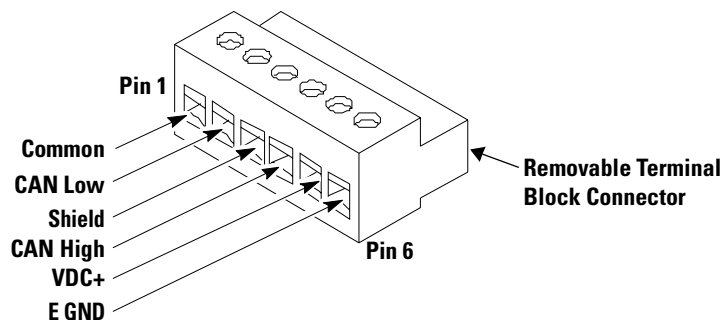
4. If you are not using a prewired DeviceNet connector, pull the DeviceNet cable through the conduit at the top of the enclosure. Then attach the 6 DeviceNet cable leads to the removable terminal block connector.

Page 1-7 provides a description of the DeviceNet connections.

ATTENTION



Do not connect the DeviceNet network to the DeviceNet terminal block connector when power is applied to the network or you may damage the circuit board or the DeviceNet network.

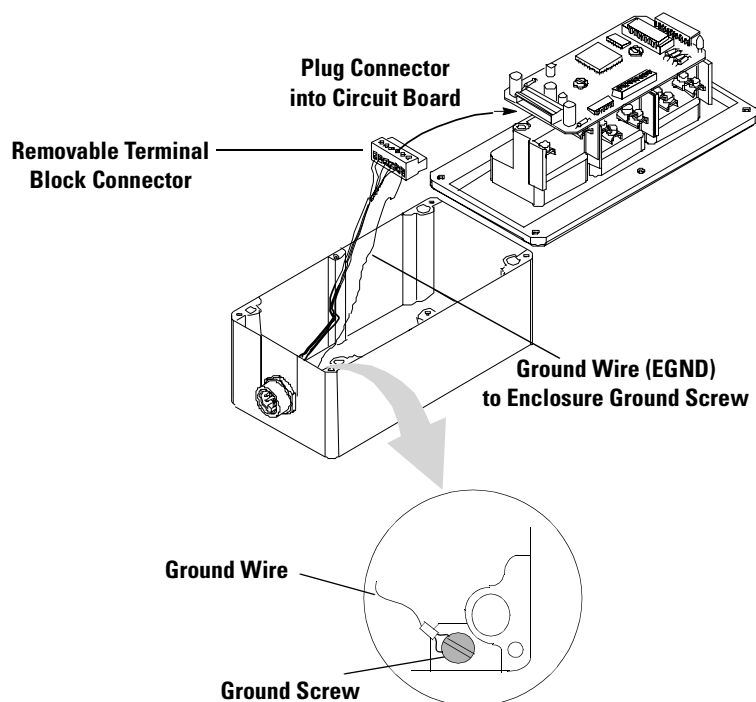


ATTENTION

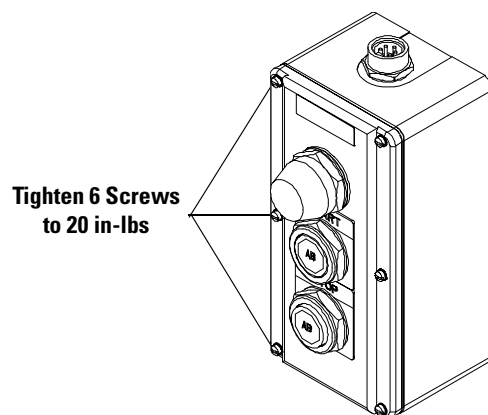


Use conduit fittings with proper seals on the DeviceNet cable to maintain a watertight enclosure.

5. Plug the DeviceNet terminal block connector into the circuit board.



6. Connect ground wire (E GND) to enclosure ground screw.
7. Secure the cover with the 6 mounting screws. Tighten screws to 20-in lbs.



Specifications

Electrical

Supply Voltage	11 to 25V DC
Power Consumption	7 Watts Maximum
Inputs	
Maximum Number	4
Type	Hard Contact Sourcing
Voltage/Current	24V DC/24mA Maximum
Isolation	None
Outputs	
Maximum Number	2
Voltage/Current	24V DC/100mA Maximum
Isolation	None

Mechanical

Enclosure	NEMA Type 4, 12, 13
Weight	3.1 lbs (1.4 kg)
Dimensions	
Inches	8.26 (H) x 3.81 (W) x 4.41 (D)
Millimeters	209.8 (H) x 96.8 (W) x 112.0 (D)

Environment

Ambient Temperature	
Operating Temperature	0 to 55° C (32 to 131° F)
Storage	-40 to 85° C (-40 to 185° F)
Relative Humidity (non-condensing)	5 to 95% 50% max at 40° C (104° F)
Shock and Vibration	
Shock (operating)	30G
Impulse Shock (non-operating)	50G
Vibration (operating)	2.5G at 58 to 2000 Hz 5 to 57 Hz 0.38mm displacement (peak-to-peak)
Vibration (non-operating)	5.0G at 58 to 2000 Hz 5 to 57 Hz 0.76mm displacement (peak-to-peak)

Communications

DeviceNet	
Data Rates	125K, 250K, 500K BPS
Maximum Distance	500 meters (1600 feet) @125K 200 meters (600 feet) @250K 100 meters (300 feet) @500K
LED Indicator (Mod/Net Status)	Operating Status (Green/Red)

Certifications

2705-T3DN1B42A (conduit entry)	UL Listed for Hazardous Location A196 Approved for Class I, Groups A, B, C, D, Division 2, C-UL
2705-T3DN1A42A (sealed connector)	UL Listed A191, C-UL

DeviceNet Information

The RediSTATION operates as a slave device on the DeviceNet network. The RediSTATION supports Explicit Messages and Polled I/O Messages of the predefined master/slave connection set. It does not support the Explicit Unconnected Message Manager (UCMM).

This appendix defines the DeviceNet message types, class services and objects that are supported by the RediSTATION device.

DeviceNet Message Types

As a group 2 slave device, the RediSTATION supports the following message types.

CAN Identifier	Group 2 Message Type
10xxxxxx111	Duplicate MAC ID Check Messages
10xxxxxx110	Unconnected Explicit Request Messages
10xxxxxx101	Master I/O Poll Command Message
10xxxxxx100	Master Explicit Request Message

In the CAN Identifier, xxxxxx = the RediSTATION Node Address.

DeviceNet Class Services

As a group 2 slave device, the RediSTATION supports the following class services and instance services.

Service Name	Service Code
Reset	0x05
Get_Attribute_Single	0x0E
Set_Attribute_Single	0x10
Allocate_Group_2_Identifier_Set	0x4B
Release_Group_2_Identifier_Set	0x4C

DeviceNet Object Classes

The RediSTATION device supports the following DeviceNet object classes.

Class	Object
0x01	Identity
0x03	DeviceNet
0x04	Assembly
0x05	Connection
0x08	Discrete Input Point
0x09	Discrete Output Point

Identity Object

Class Code: 01 Hex Class Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	1

Number of Instances: 1 Instance Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Vendor	UINT	1
2	Get	Product Type	UINT	0
3	Get	Product Code	UINT	1
4	Get	Revision Major Revision Minor Revision	Structure of: USINT USINT	1 5
5	Get	Status	WORD	Device_Status ¹
6	Get	Serial Number	UDINT	unique 32 bit number
7	Get	Product Name String Length ASCII String	Structure of: USINT STRING[5]	5 "2705T"
9	Get	Configuration Consistency Value	UINT	DIP Switch Setting (10 bit)

Device_Status ¹			
bit 0	owned	0 = not owned or allocated 1 = owned (Group 2 allocated to master)	
bit 1	reserved	always 0	
bit 2	configured	always 0	
bit 3	reserved	always 0	
bit 4-7	vendor specific	all 0	
bit 8	minor cfg fault	0 = no fault 1 = minor configuration fault	
bit 9	minor device fault	0 = no fault 1 = minor device fault	
bit 10	major cfg fault	0 = no fault 1 = major configuration fault	
bit 11	major device fault	0 = no fault 1 = major device fault	
bit 12, 13	reserved	always 0	
bit 14, 15	reserved	always 0	

Common Services

Service Code	Implemented		Service
	Class	Instance	
0E _{hex}	Yes	Yes	Get_Attribute_Single
05 _{hex}	No	Yes	Reset

DeviceNet Object

Class Code: 03 Hex Class Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	2

Number of Instances: 1 Instance Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Node Address	USINT	DIP Switch 6-1 defines
2	Get	Data Rate	USINT	DIP Switch 8-7 defines
3	Get/Set	BOI	BOOL	default = 0
4	Get/Set	Bus-Off Counter	USINT	range 0 - 255 ¹
5	Get/ Special	Allocation Information Allocation Choice Byte Master's Node Addr	Structure of: BYTE USINT	Allocation Byte ² 0-63 = master address 255 = unallocated

- 1 Set_attribute_single service to Instance Attribute 4 resets count value to 0, regardless of the value. Cannot preload this counter with nonzero value.
- 2 Allocation Byte bit 0 explicit message supported, 1 to allocate
 bit 1 polled supported, 1 to allocate
 bit 2 bit_strobe not supported, always 0
 bit 3-7 reserved always 0

Common Services

Service Code	Implemented		Service
	Class	Instance	
0E _{hex}	Yes	Yes	Get_Attribute_Single
10 _{hex}	No	Yes	Set_Attribute_Single
4B _{hex}	No	Yes	Allocate_Master/ Slave_Connection_Set
4C _{hex}	No	Yes	Release_Master/ Slave_Connection_Set

Connection Object

Class Code: 05 Hex Class Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	1

Number of Instances: 2

Instance 1 Attributes (Explicit Message Connection)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	State	USINT	0 = nonexistent 3 = established 5 = deferred delete
2	Get	Instance Type	USINT	0 = explicit message
3	Get	Transport Class Trigger	USINT	83 _{hex}
4	Get	Produced Connection ID	UINT	10xxxxxx011 _{binary} ¹
5	Get	Consumed Connection ID	UINT	10xxxxxx100 _{binary} ¹
6	Get	Initial Comm Characteristics	USINT	21 _{hex}
7	Get	Produced Connection Size	UINT	7
8	Get	Consumed Connection Size	UINT	7
9	Get/Set	Expected Packet Rate	UINT	2500 msec (default), with time resolution of 10 msec
12	Get/Set	Watchdog Timeout Action	USINT	1 = autodelete (default) 3 = transitions to deferred delete
13	Get	Produced Connection Path Length	UINT	0
14	Get	Produced Connection Path		null (no data)
15	Get	Consumed Connection Path Length	UINT	0
16	Get	Consumed Connection Path		null (no data)

¹ xxxxxx = node address

Instance 2 Attributes (Polled I/O Message)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	1 = I/O message
3	Get	Transport Class Trigger	USINT	82 _{hex}
4	Get	Produced Connection ID	UINT	01111xxxxx _{binary} ¹
5	Get	Consumed Connection ID	UINT	10xxxxx101 _{binary} ¹
6	Get	Initial Comm Characteristics	USINT	01 _{hex}
7	Get	Produced Connection Size	UINT	1
8	Get	Consumed Connection Size	UINT	1
9	Get/Set	Expected Packet Rate	UINT	0 msec (default), with time resolution of 10 msec
12	Get/Set	Watchdog Timeout Action	USINT	0 = timeout (default) 1 = auto delete 2 = auto reset
13	Get	Produced Connection Path Length	UINT	6
14	Get	Produced Connection Path Logical Segment, Class Class Number Logical Segment, Instance Instance Number Logical Segment, Attribute Attribute Number	Structure of: USINT USINT USINT USINT USINT USINT	20 _{hex} 04 _{hex} 24 _{hex} 01 _{hex} 30 _{hex} 03 _{hex}
15	Get	Consumed Connection Path Length	UINT	6
16	Get	Consumed Connection Path Logical Segment, Class Class Number Logical Segment, Instance Instance Number Logical Segment, Attribute Attribute Number	Structure of: USINT USINT USINT USINT USINT USINT	20 _{hex} 04 _{hex} 24 _{hex} 02 _{hex} 30 _{hex} 03 _{hex}

¹ xxxxxx = node address

Common Services

Service Code	Implemented		Service
	Class	Instance	
05 _{hex}	Yes	Yes	Reset ¹
0E _{hex}	Yes	Yes	Get_Attribute_Single
10 _{hex}	No	Yes	Set_Attribute_Single

¹ For Class, resets all connections to nonexistent. For Instance, resets connection timer, and if applicable, changes the state from timed out to established.

Assembly Objects

Class Code: 04 Hex

Class Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	2

Number of Instances: 2

Instance 1 Attributes (Input Assembly)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Data	Byte	Input_Data ¹

¹ Input Data:

- bit 0 = discrete input object instance 1, attribute 3 (input value)
- bit 1 = discrete input object instance 2, attribute 3 (input value)
- bit 2 = discrete input object instance 3, attribute 3 (input value)
- bit 3 = discrete input object instance 4, attribute 3 (input value)
- bit 4 = discrete output object instance 1, attribute 4 (status)
- bit 5 = discrete output object instance 2, attribute 4 (status)
- bit 6,7 = undefined (0)

Instance 2 Attributes (Output Assembly)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Data	Byte	Output_Data ²

² Output Data:

- bit 0 = discrete output object instance 1, attribute 3 (output value)
- bit 1 = discrete output object instance 1, attribute 10 (flash output)
- bit 2 = discrete output object instance 2, attribute 3 (output value)
- bit 3 = discrete output object instance 2, attribute 10 (flash output)
- bit 4-7 = undefined (0)

Common Services

Service Code	Implemented		Service
	Class	Instance	
0E _{hex}	Yes	Yes	Get_Attribute_Single

Discrete Input Objects

Class Code: 08 Hex

Class Attributes

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	2

Number of Instances: 4

Instance 1 Attributes (Discrete Input Number 1)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Input Value	BOOL	0 = OFF 1 = ON

Instance 2 Attributes (Discrete Input Number 2)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Input Value	BOOL	0 = OFF 1 = ON

Instance 3 Attributes (Discrete Input Number 3)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Input Value	BOOL	0 = OFF 1 = ON

Instance 4 Attributes (Discrete Input Number 4)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Input Value	BOOL	0 = OFF 1 = ON

Common Services

Service Code	Implemented		Service
	Class	Instance	
0E _{hex}	Yes	Yes	Get_Attribute_Single

Discrete Output Point Objects**Class Code: 09 Hex****Class Attributes**

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
1	Get	Revision	UINT	1

Number of Instances: 2**Instance 1 Attributes (Discrete Output Number 1)**

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Output Value	BOOL	0 = OFF 1 = ON
4	Get	Status	BOOL	0 = OK 1 = Fault
5	Get	Fault State	BOOL	DIP Switch 9 defines: 0 = use fault value 1 = hold last state
6	Get	Fault Value	BOOL	0 (OFF)
7	Get	Idle State	BOOL	0 = use idle state
8	Get	Idle Value	BOOL	0 (OFF)
10	Get	Flash Output	BOOL	0 = no flash 1 = flash
11	Get	Flash Rate	USINT	DIP Switch 10 defines 0 (OFF) = 1 HZ 1 (ON) = 2 HZ

Instance 2 Attributes (Discrete Output Number 2)

Attribute ID	Access Rule	Name	DeviceNet Data Type	Data Value
3	Get	Output Value	BOOL	0 = OFF 1 = ON
4	Get	Status	BOOL	0 = OK 1 = Fault
5	Get	Fault State	BOOL	DIP Switch 9 defines: 0 = use fault value 1 = hold last state
6	Get	Fault Value	BOOL	0 (OFF)
7	Get	Idle State	BOOL	0 = use idle state
8	Get	Idle Value	BOOL	0 (OFF)
10	Get	Flash Output	BOOL	0 = no flash 1 = flash
11	Get	Flash Rate	USINT	DIP Switch 10 defines: 0 (OFF) = 1 HZ 2 (ON) = 2 HZ

Common Services

Service Code	Implemented		Service
	Class	Instance	
0E _{hex}	Yes	Yes	Get_Attribute_Single

User Configuration

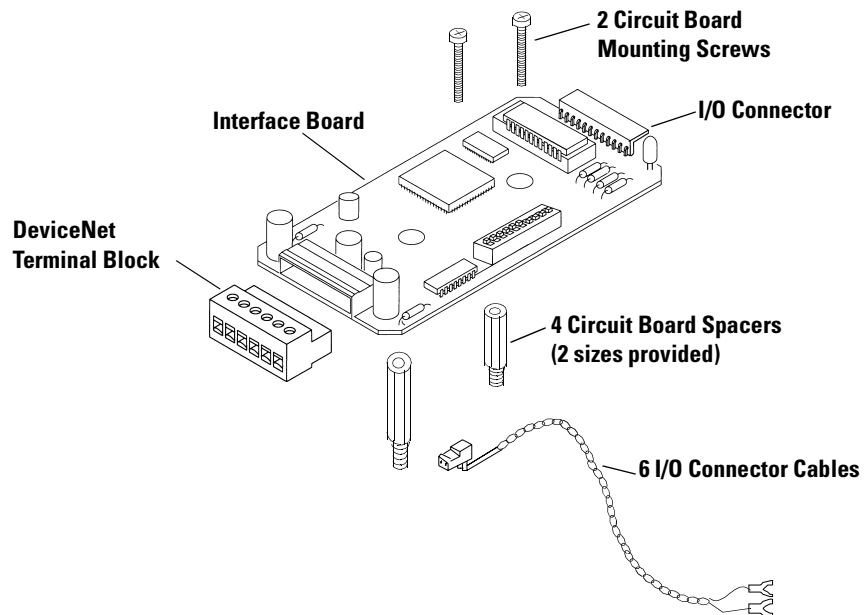
An unpopulated configuration is available for customer configuration and installation of operator devices. This appendix provides information on:

- kit contents
- DeviceNet interface board specifications
- mounting dimensions of board
- connecting devices to board

Kit Contents

The unpopulated configuration consists of:

- DeviceNet interface board
- 6 I/O connector cables (supporting 4 inputs and 2 outputs)
- DeviceNet PCB terminal block
- mounting hardware



Specifications of DeviceNet Interface Board

Electrical

Supply Voltage	11 to 25V DC
Power Consumption	7 Watts Maximum, Including I/O Devices
Inputs	
Maximum Number	4
Type	Hard Contact Sourcing
Voltage Current	24V DC/24mA Maximum
Isolation	None
Outputs	
Maximum Number	2
Voltage/Current	24V DC/100mA Maximum
Isolation	None

Communications

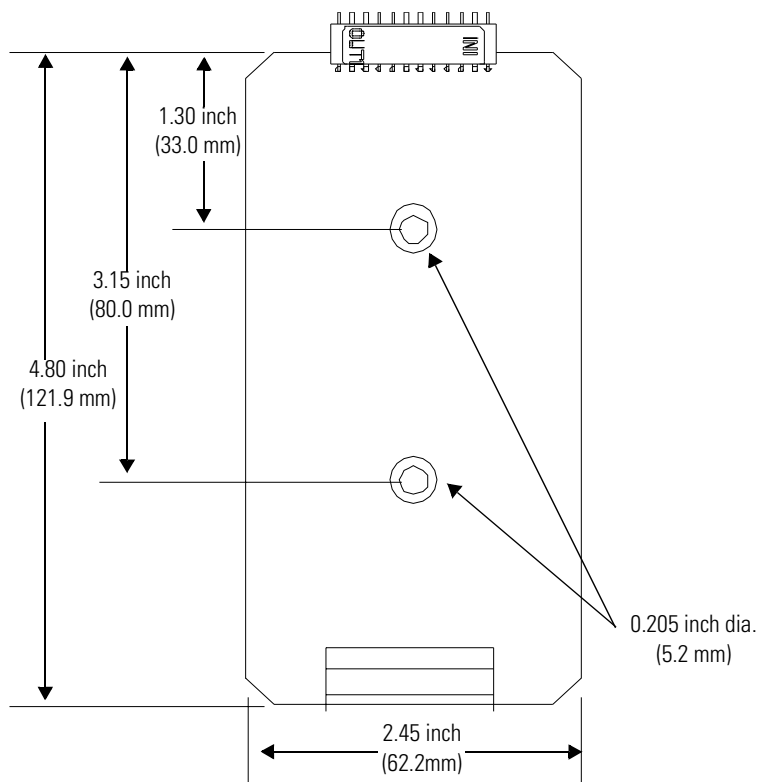
DeviceNet	
Baud Rates	125K, 250K, 500K BPS
Maximum Distance	500 meters (1600 feet) @ 125K 200 meters (600 feet) @ 250K 100 meters (300 feet) @ 500K

Environmental

Ambient Temperature	
Operating	0 to 55° C (32 to 131° F)
Storage	-40 to 85° C (-40 to 185° F)
Relative Humidity (non-condensing)	5 to 95% 50% maximum at 40° C (104° F)

Mounting Dimensions

Refer to the following dimensions when mounting the DeviceNet Interface Board inside an enclosure.

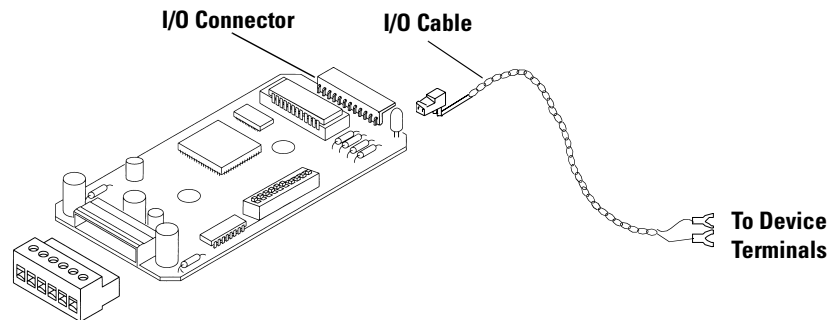


Connecting Devices

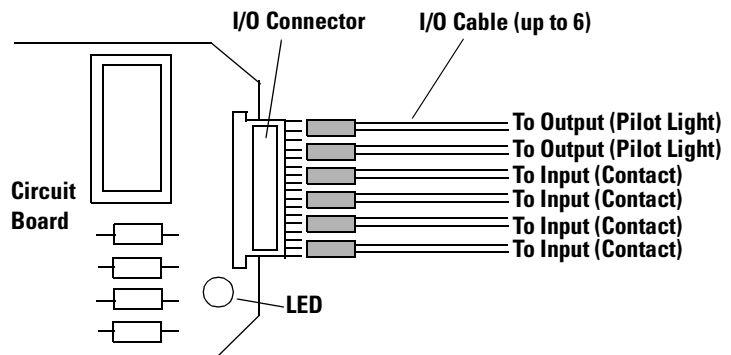
This section shows how to connect devices to the DeviceNet Interface Board and connect the DeviceNet cable to the DeviceNet terminal block connector.

To install devices:

1. Connect the device terminals to the I/O connector using the I/O cables. An I/O cable consists of a twisted (red/black) wire pair. Each set of contacts or pilot light connects to an I/O cable.



Every 2 consecutive pins on the I/O connector connects to an I/O cable connector. The I/O connector supports 2 outputs and 4 inputs.

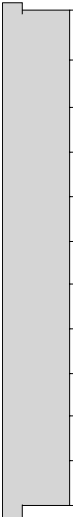


ATTENTION



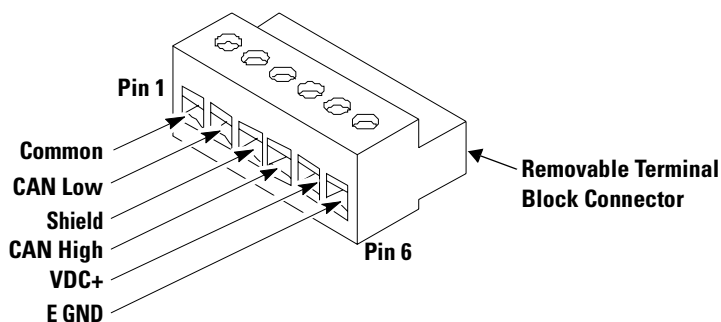
Do not connect I/O pins to standard control voltages. See page C-2 for maximum input voltages. I/O pins are not electrically isolated from the DeviceNet circuitry.

To simplify wiring, input devices and output devices attach to opposite ends of the I/O connector. The following table defines pin functions on the I/O connector. Output devices connect to pins 1-2 and 3-4. Input devices connect to pins 5-6, 7-8, 9-10 and 11-12. Unused pins are left open.

I/O Connector	Pin #	Pin Label	Function
	1	OUT1+	Connects Output Device
	2	OUT1-	
	3	OUT2+	Connects Output Device
	4	OUT2-	
	5	IN4+	Connects Input Device
	6	IN4-	
	7	IN3+	Connects Input Device
	8	IN3-	
	9	IN2+	Connects Input Device
	10	IN2-	
	11	IN1+	Connects Input Device
	12	IN1-	

2. Mount the circuit board using the spacers and mounting screws provided. Tighten circuit board mounting screws to 14 in-lbs.
3. Attach the 6 DeviceNet cable leads to the DeviceNet removable terminal block connector.

Page 1-7 provides a description of the DeviceNet connections.



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