



 **Allen-Bradley**

DeviceNet
CONFORMANCE TESTED
Stack Light

Bulletin 855T

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.

Allen-Bradley is a trademark of Rockwell Automation

DeviceNet is a trademark of the Open DeviceNet Vendor Association (ODVA).

European Communities (EC) Directive Compliance

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

EMC Directive

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

- EN 50081-2 EMC — Generic Emission Standard, Part 2 — Industrial Environment
- EN 50082-2 EMC — Generic Immunity Standard, Part 2 — Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is not required to meet Council Directive 73/23/EEC Low Voltage, as it is designed for use with a voltage rating below 50V for alternating current and below 75V for direct current. The requirements of EN 60947-5-1:1997 Low-Voltage Switchgear and Controlgear, Part 5 - Control Circuit Devices, have been applied.

Table of Contents

Preface

Intended Audience	i
Contents of Manual	i
Related Publications	ii
EDS Web Site	ii

Chapter 1 — Overview of DeviceNet Stack Light

Chapter Objectives	1-1
Description	1-1
Base Features.	1-2
Module Positions	1-3
Rotary Switches.	1-3
DeviceNet Connection.	1-3
Typical DeviceNet Configuration	1-4
DeviceNet Components.	1-5
Replacement Parts.	1-5

Chapter 2 — Quick Start

Chapter Objectives	2-1
Data Rate Configuration.	2-1
Node Address Configuration	2-2
Installing the Modules	2-2
Connection to the Network	2-2
Stack Light Parameter Configuration.	2-3
Scanner Configuration	2-6

Chapter 3 — Installation and Mounting

Chapter Objectives	3-1
DeviceNet Guidelines.	3-1
Equipment Needed.	3-1
Setting the Rotary Switches	3-1
DeviceNet Stack Light Base Dimensions	3-4
Mounting the DeviceNet Stack Light	3-5

Chapter 4 — Operations

Chapter Objectives	4-1
Parameter Configuration	4-1
I/O Configuration	4-7
Resetting the Device	4-8
DeviceNet Operations	4-8

Chapter 5 — Troubleshooting and Maintenance

Chapter Objectives	5-1
Preventive Maintenance	5-1
LED Indicators	5-2
Troubleshooting	5-2
Bulb Burnout	5-3

Chapter 6 — Off-Line Node Recovery

Chapter Objectives	6-1
Overview	6-1
Sample Recovery	6-2

Appendix A — Specifications

Certifications	A-2
Special Notes	A-2

Appendix B — DeviceNet Information

General Information	B-1
Message Types	B-1
Class Services	B-1
Object Classes	B-2

Preface

This manual gives an overview of the Bulletin 855T DeviceNet™ Stack Light 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 855T DeviceNet™ Stack Light 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

This manual is organized as follows:

Table P.A

Chapter	Title	Description
—	Preface	Describes the purpose and contents of the manual, and the intended audience.
1	Overview of DeviceNet Stack Light	Provides an overview of the 855T DeviceNet™ Stack Light and its features.
2	Quick Start	Describes how to get the DeviceNet™ Stack Light operating on the network.
3	Installation and Mounting	Describes how to configure, mount, and install the 855T DeviceNet™ Stack Light device on the DeviceNet™ Network.
4	Operations	Describes 855T DeviceNet™ Stack Light operations and other pertinent information.
5	Troubleshooting and Maintenance	Provides information on how to troubleshoot and maintain the device.
A	Specifications	Provides 855T DeviceNet™ Stack Light specifications.
B	DeviceNet Information	Describes DeviceNet™ message types, class services, and object classes supported by the 855T DeviceNet™ Stack Light.

Table P.B

Publication Title	Publication No.
DeviceNet Media Design Installation Guide	DNET-UM072*-EN-P
1756-DNB Scanner Module Configuration	1756-6.5.15

Related Publications

The following is a DeviceNet Network related publication:

DNET-UM072*-EN-P, *DeviceNet Media Design Installation Guide*

EDS Web Site

EDS files are available for downloading at: <http://www.ab.com/networks/eds>

Overview of DeviceNet Stack Light

Chapter Objectives

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

Table 1.A

Section	Page	Section	Page
Description	1-1	DeviceNet Connection	1-3
Base Features	1-2	Typical DeviceNet Configuration	1-4
Module Positions	1-3	DeviceNet Components	1-5
Rotary Switches	1-3	Replacement Parts	1-5

Description

The 855T Control Tower™ Stack Light line offers DeviceNet Bases for applications where network communication is desired. All of the functionality for the DeviceNet Interface is contained within the mounting base. All light and sound modules for the 855T Control Tower™ Stack Light line are compatible with the standard bases, or with DeviceNet Bases. The entire stack is powered from the DeviceNet Network. A separate power supply is not required.

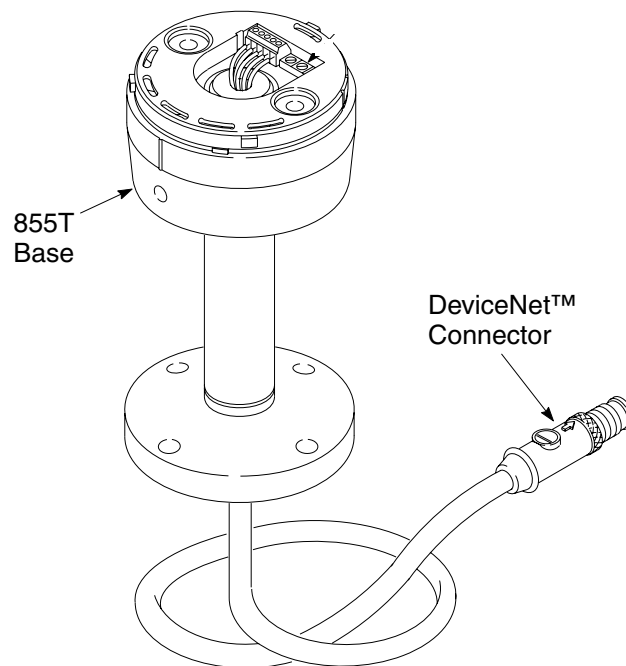
The 855T Control Tower™ Stack Light DeviceNet Bases allow up to five light modules, four light modules plus a combination light and sound module, four light modules plus a single-tone sound module, three light modules plus a dual-tone sound module, or three light modules plus a dual-circuit light and sound module.

Summary of Features

- Standard or assembled configurations
- Surface mounting, pole mounting (10 cm or 25 cm), vertical mounting, and conduit mounting available
- Allows the use of up to five modules in one stack
- NEMA Type 4/4X/13 environmental rating and IP65 environmental rating
- Easy installation and startup
- DeviceNet connectivity
- Powered by DeviceNet connection (no power supply required)
- Available with stranded wire, micro connector, or mini connector
- DeviceNet Cable is pre-wired to all bases

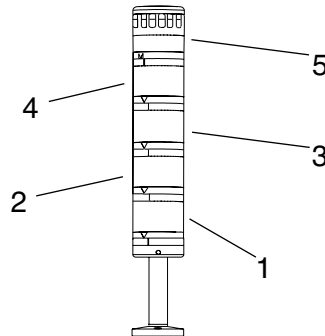
Base Features

Figure 1.1



Module Positions

Figure 1.2



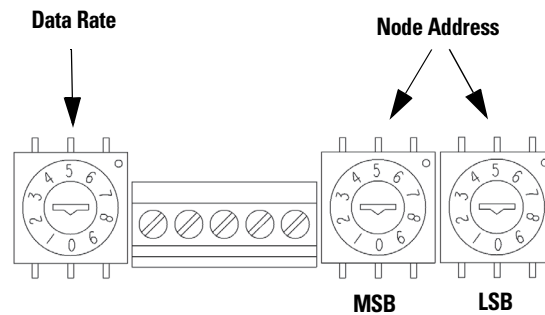
Rotary Switches

The DeviceNet Stack Light has three 10-position rotary switches for setting:

- DeviceNet Data Rate
- DeviceNet Node Address

The rotary switches are located on the circuit board on the top of the base. The switch settings and functions are shown below.

Figure 1.3



DeviceNet Connection

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

1-4 Overview of DeviceNet Stack Light

The DeviceNet Stack Light connects to the DeviceNet Network using a cable with a micro connector, a mini connector, or an open-style connector.

Table 1.B DeviceNet Micro Connector

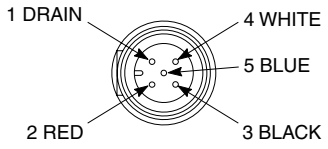
Micro Connector	Pin #	Signal	Function	Color
	1	SHIELD	SHIELD	Uninsulated
	2	VDC+	Power Supply	Red
	3	COM	Common	Black
	4	CAN_H	Signal High	White
	5	CAN_L	Signal Low	Blue

Table 1.C DeviceNet Mini Connector

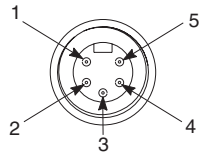
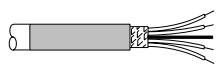
Mini Connector	Pin #	Signal	Function	Color
	1	SHIELD	SHIELD	Uninsulated
	2	VDC+	Power Supply	Red
	3	COM	Common	Black
	4	CAN_H	Signal High	White
	5	CAN_L	Signal Low	Blue

Table 1.D DeviceNet Open-Style Connector

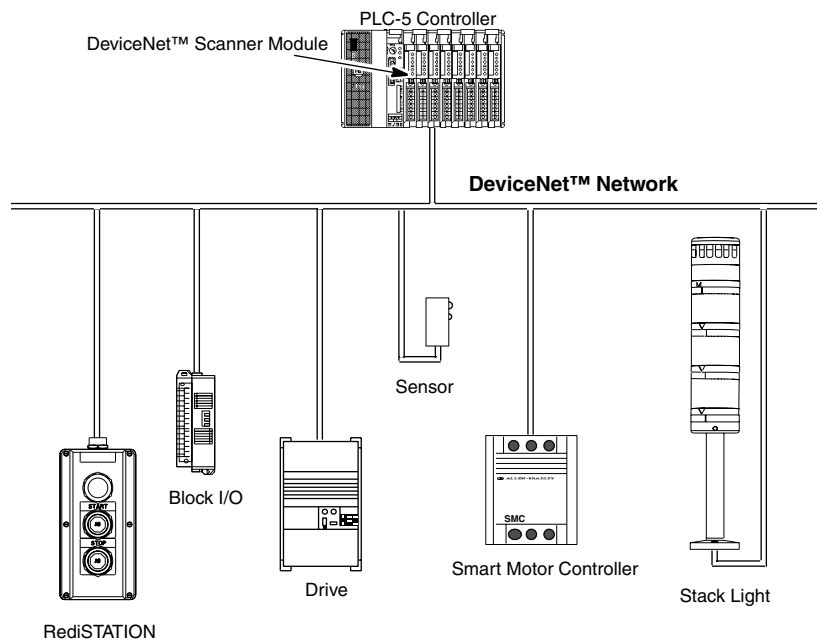
Open-Style Connector	Signal	Function	Color
	COM	Common	Black
	CAN_L	Signal Low	Blue
	SHIELD	Shield	Uninsulated
	CAN_H	Signal High	White
	VDC+	Power Supply	Red

Typical DeviceNet Configuration

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

The DeviceNet Stack Light operates on the network as a slave device. It does not initiate communications except for a duplicate node address check on power-up. The master writes data to, and receives data back from, the DeviceNet Stack Light.

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

Figure 1.4

DeviceNet Components

DeviceNet Cables and components are available from Allen-Bradley as separate cat. nos.

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

Replacement Parts

The DeviceNet Stack Light Bases and pre-assembled stacks come with all the parts required to install and use the product. The installer needs only to supply the mounting hardware.

Replacement parts for 855T components (modules, replacement gaskets, and replacement lamps) are available as separate cat. nos. Refer to the *Signal Solutions Selection Guide* (Publication 855-SG001*-EN-P) or the Industrial Controls Catalog.

Quick Start

Chapter Objectives

This chapter provides the necessary steps to get the DeviceNet Stack Light operating on the network. It contains the following sections:

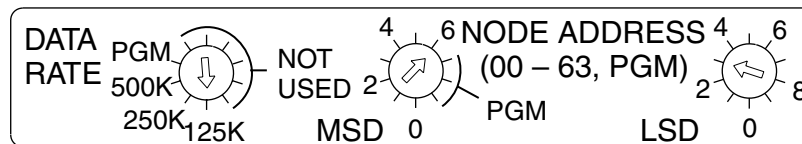
Table 2.A

Section	Page	Section	Page
Data Rate Configuration	2-1	Connection to the Network	2-2
Node Address Configuration	2-2	Stack Light Parameter Configuration	2-3
Installing the Modules	2-2	—	—

Data Rate Configuration

Rotary switch 3 (S3) sets the data rate at which the DeviceNet Stack Light communicates on the DeviceNet Network. The factory default setting is 125 KB.

Figure 2.1

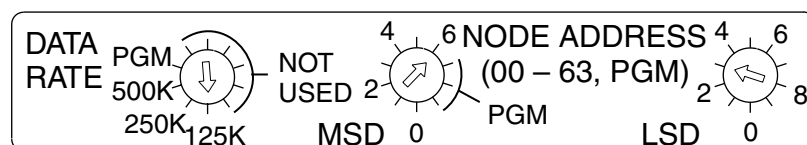


For more information on data rate configuration, refer to Chapter 3 — Installation and Mounting (Setting the Data Rate).

Node Address Configuration

Rotary switches 1 (S1) and 2 (S2) set the node address (0...63) of the stack light on the DeviceNet Network. The factory default is 63.

Figure 2.2



For more information on node address configuration, refer to Chapter 3 — Installation and Mounting (Setting the DeviceNet Node Address).

Installing the Modules

The stack light modules are installed to the base by placing a sealing o-ring between the base and the module, lining up the arrow on the bottom of the module with the line on the top of the prior module or base, and twisting the top module clockwise to lock them into place.

IMPORTANT

The DeviceNet Base is compatible with all 24V DC 855T modules.

For more information on different modules, refer to the *Signal Solutions Selection Guide* (Publication 855-SG001*-EN-P) or the Industrial Controls Catalog.

Connection to the Network

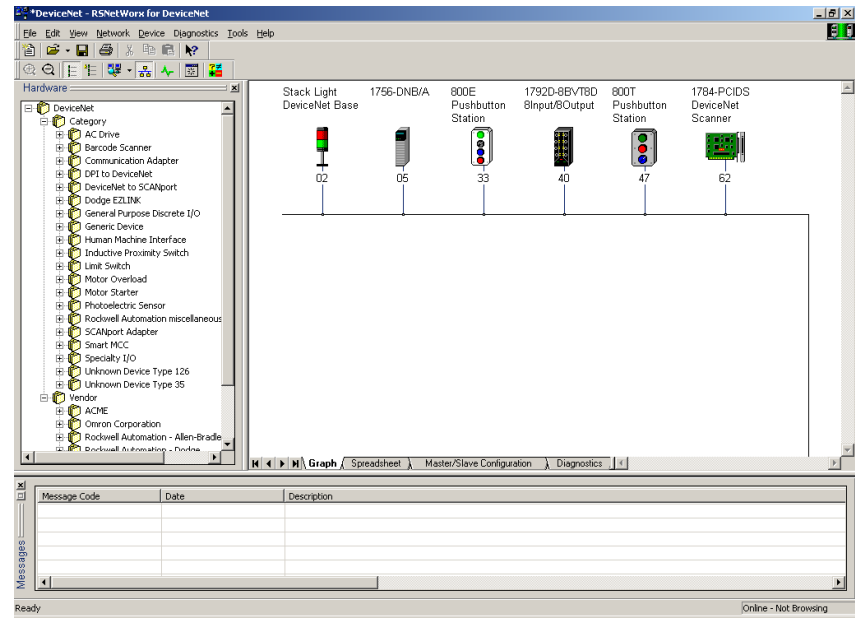
Wire the DeviceNet Stack Light to an operating network. If the device is an 855T-DSxxxx, the wires should be connected to a terminal block. If the device is an 855T-DMxxxx or 855T-DLxxxx, it will be connected with the quick disconnect connector. The device is fully powered by the network, therefore it is important that the device is located near a power supply.

For more information on system installation, refer to the *DeviceNet Media Design Installation Guide* (Publication DNET-UM072*-EN-P).

Stack Light Parameter Configuration

For proper operation, the parameters of the stack light must be configured. There are several different parameters that can be configured, but the critical parameters are Module Type and Module Mode. The parameters can be configured using RSNetWorx for DeviceNet.

Figure 2.3



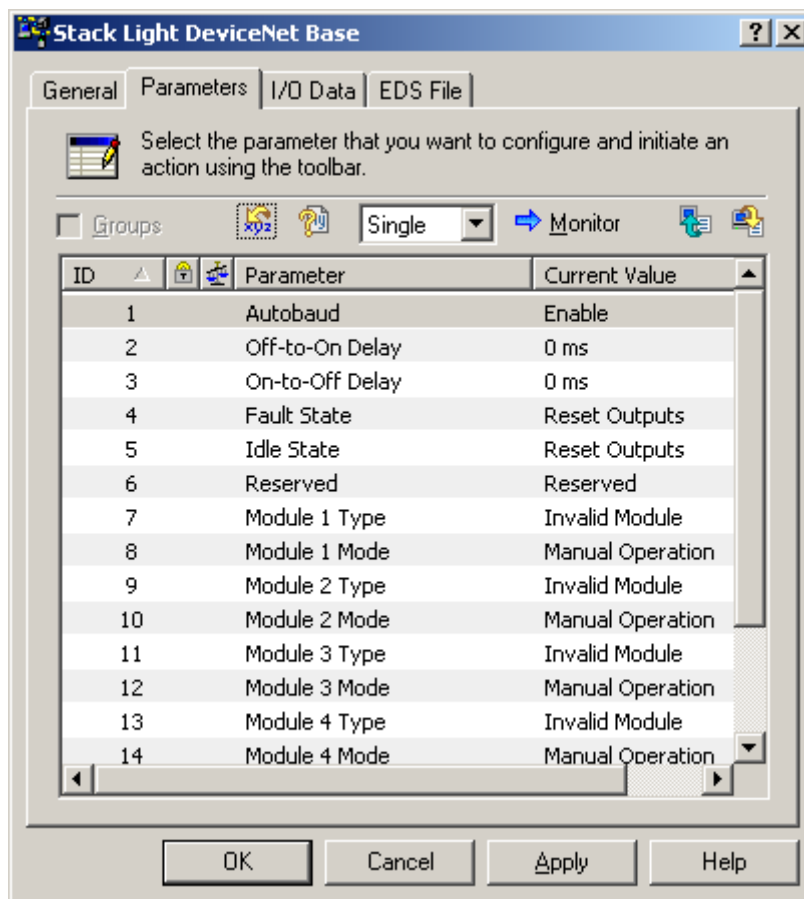
To access the parameter configuration screen from the on-line view, double-click the stack light icon.

Figure 2.4

The screenshot shows a Windows-style dialog box titled "Stack Light DeviceNet Base". It has four tabs: "General", "Parameters", "I/O Data", and "EDS File". The "General" tab is selected. Inside the dialog, there is a small icon of a stack light. Below the icon, the text "Stack Light DeviceNet Base" is displayed. There are three input fields: "Name:" with the text "Stack Light DeviceNet Base", "Description:" with an empty text area, and "Address:" with the value "2". Below these is a section titled "Device Identity [Primary]" containing five more input fields: "Vendor:" with "Rockwell Automation - Allen-Bradley [1]", "Type:" with "General Purpose Discrete I/O [7]", "Device:" with "Stack Light DeviceNet Base [756]", "Catalog:" with "855T-DXXX", and "Revision:" with "2.005". To the right of the "Revision:" field are two arrow buttons. At the bottom of the dialog are four buttons: "OK", "Cancel", "Apply", and "Help".

Select the Device Parameters tab.

Figure 2.5

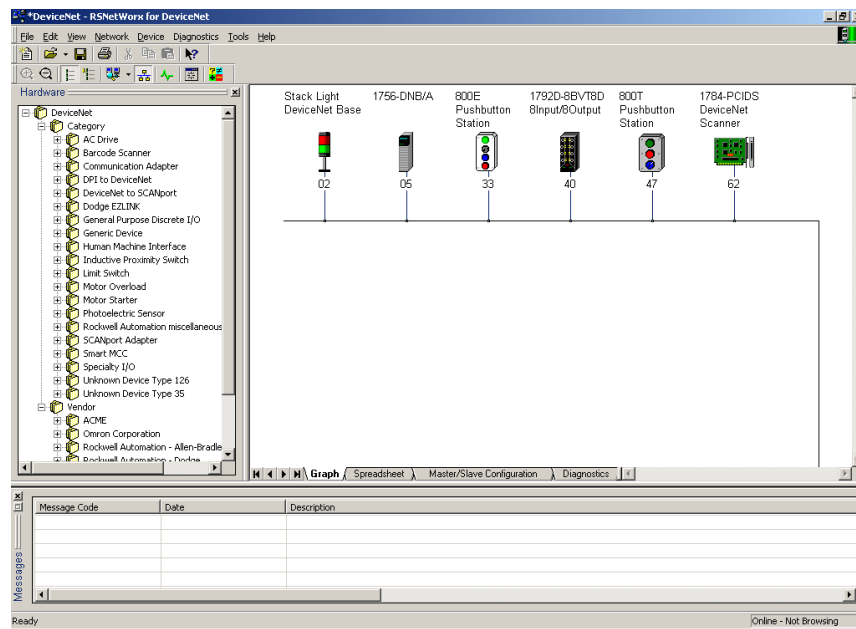


The stack light will work without any parameter changes, but for flashing patterns and bulb burnout detection, parameters must be changed. For more information on device configuration, refer to Chapter 4 — Operations (Parameter Configuration) and RSNetWorx for DeviceNet documentation.

Scanner Configuration

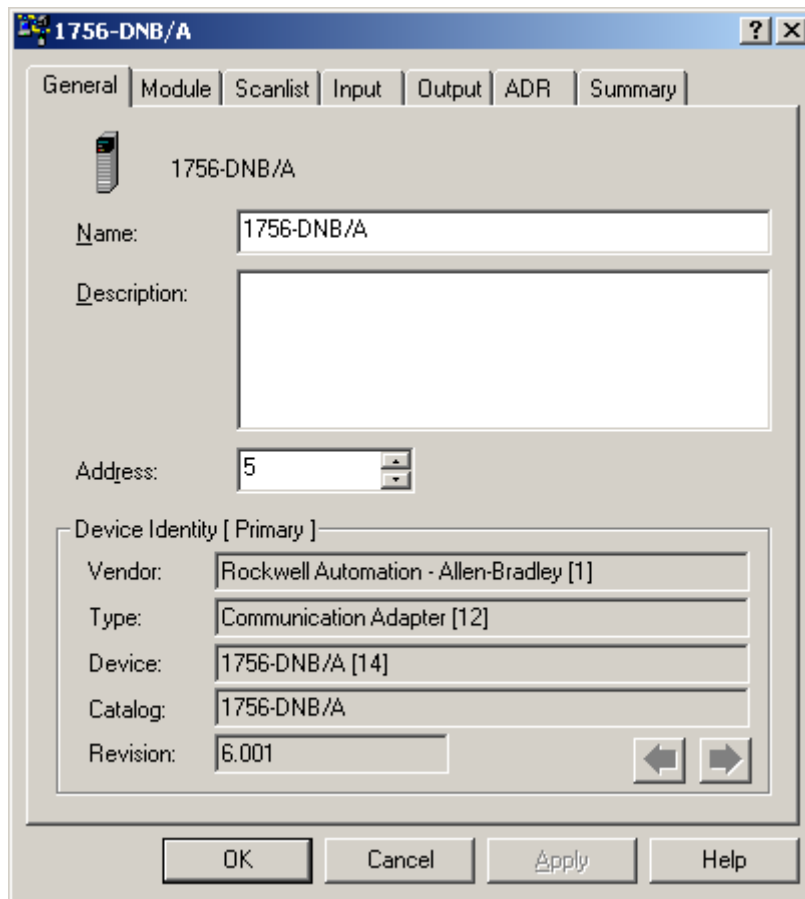
For proper operation, the scanner must be configured. The following graphics show the configuration of a 1756-DNB from the RSNetWorx for DeviceNet software.

Figure 2.6



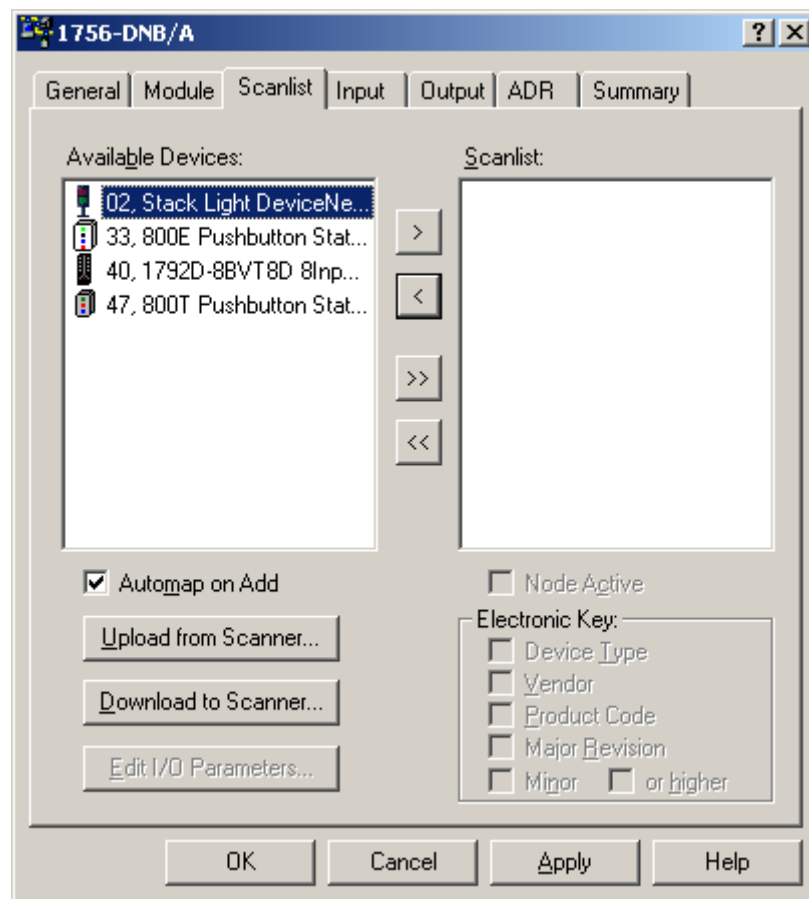
To access the Scanner Module Configuration screen from an on-line view, double-click the 1756-DNB scanner icon.

Figure 2.7



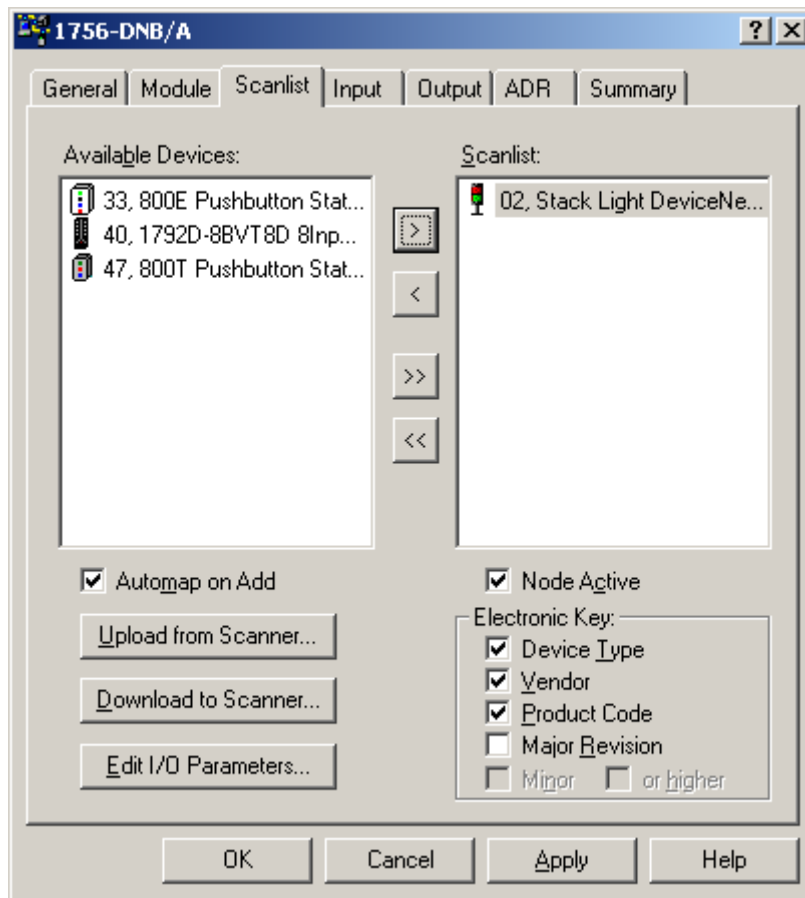
To access the Scanlist Editor, select the Scanlist tab.

Figure 2.8

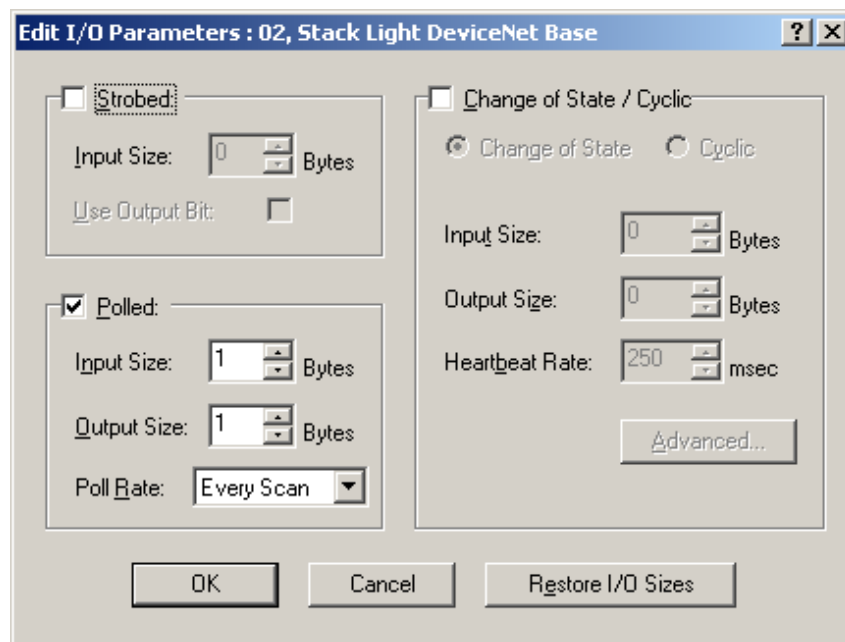


Add Stack Light DeviceNet Base to the Scanlist. Select the device in the Available Devices list. To have the software automatically assign I/O addresses, select the Automap on Add selection box. Click the > button.

Figure 2.9

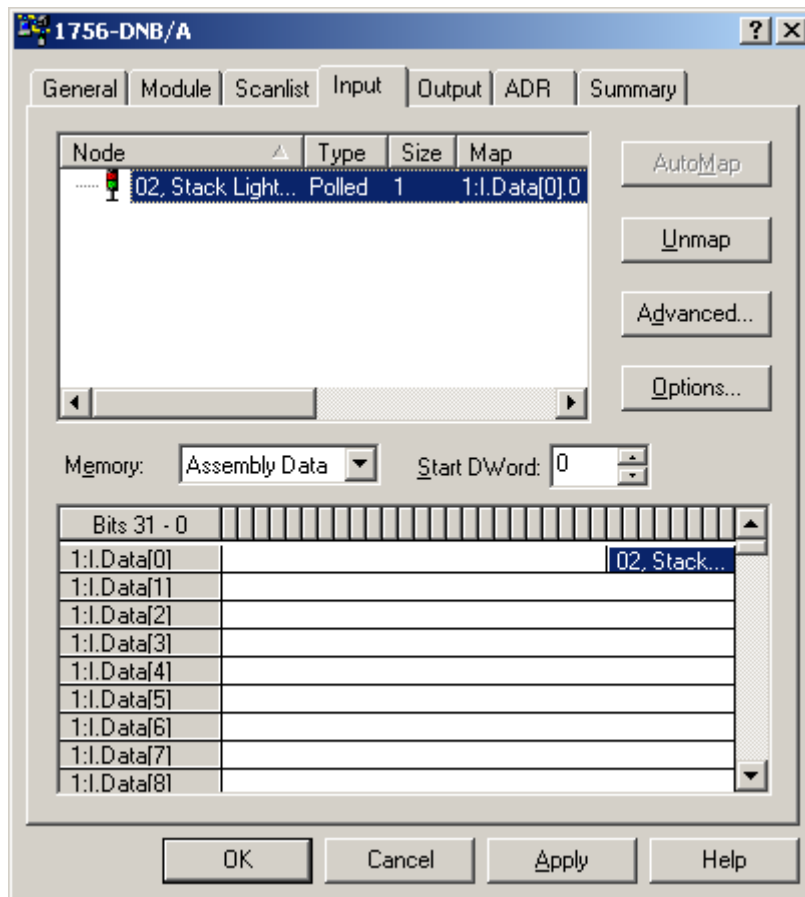


To view/edit I/O parameters, click Edit I/O Parameters.

Figure 2.10

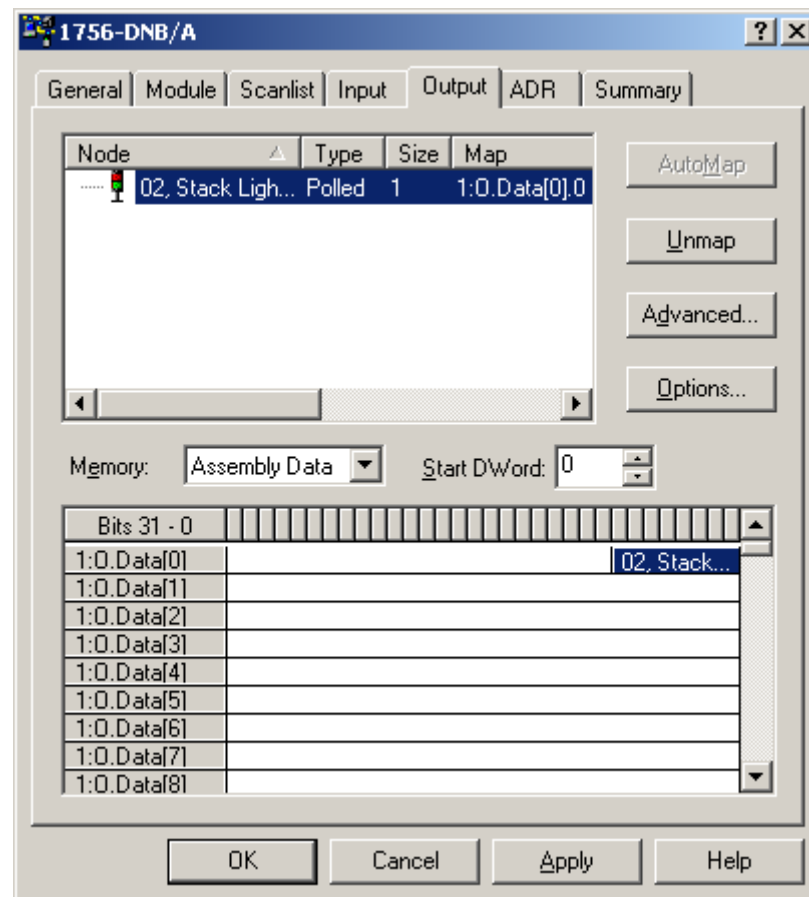
To view/edit the mapping of the input data, click Cancel or OK to return to the Scanner Module screen. Select the Input tab.

Figure 2.11



To view/edit the mapping of the output data, select the Output tab.

Figure 2.12



Installation and Mounting

Chapter Objectives

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

Table 3.A

Section	Page	Section	Page
DeviceNet Guidelines	3-1	DeviceNet Stack Light Base Dimensions	3-4
Equipment Needed	3-1	Mounting the DeviceNet Stack Light	3-5
Setting the Rotary Switches	3-1	—	—

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 DeviceNet Stack Light using standard electrician's tools:

- Slotted screwdriver of standard and small sizes (one small screwdriver, required for setting rotary switches, is included with the product)

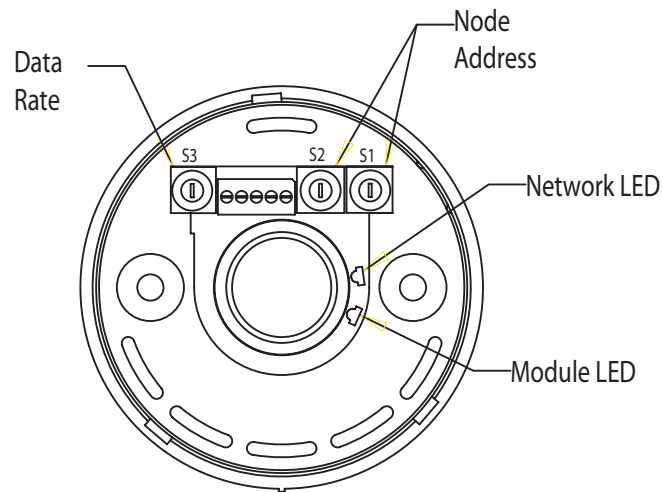
Setting the Rotary Switches

The settings of the rotary switches on the circuit board determine:

- DeviceNet Data Rate
- DeviceNet Node Address

The location of the rotary switches is shown below.

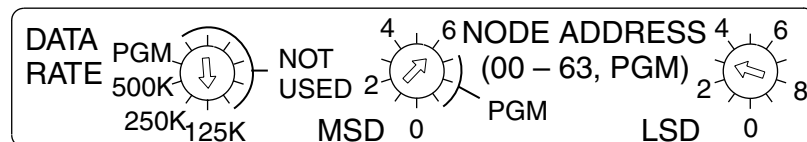
Figure 3.1



Setting the Data Rate

Rotary switch 3 (S3) sets the data rate at which the DeviceNet Stack Light communicates on the DeviceNet Network. The factory default setting is 125 KB.

Figure 3.2



3-3 Installation and Mounting

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

Table 3.B

Position	Data Rate	Cable Length (Max.)
0	125 KB	500 m (1600 ft)
1	250 KB	200 m (600 ft)
2	500 KB	100 m (300 ft)
3	Autobaud	See above, based on data rate of connected network

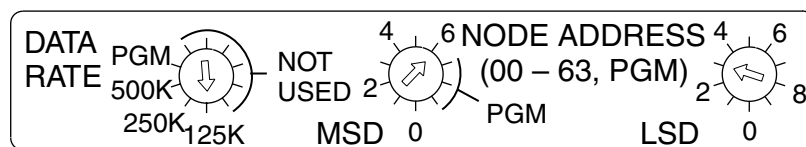
To set the DeviceNet data rate:

1. Refer to the table above to select the correct data rate.
2. If automatic baud rate selection is desired, set switch 3 (S3) in position 3. This disables the switch and allows the device to sync to an operational network (if Autobaud is disabled through parameter setup, this position is not valid).

Setting the DeviceNet Node Address

Rotary switches 1 (S1) and 2 (S2) set the node address (0...63) of the stack light on the DeviceNet Network. The factory default is 63.

Figure 3.3



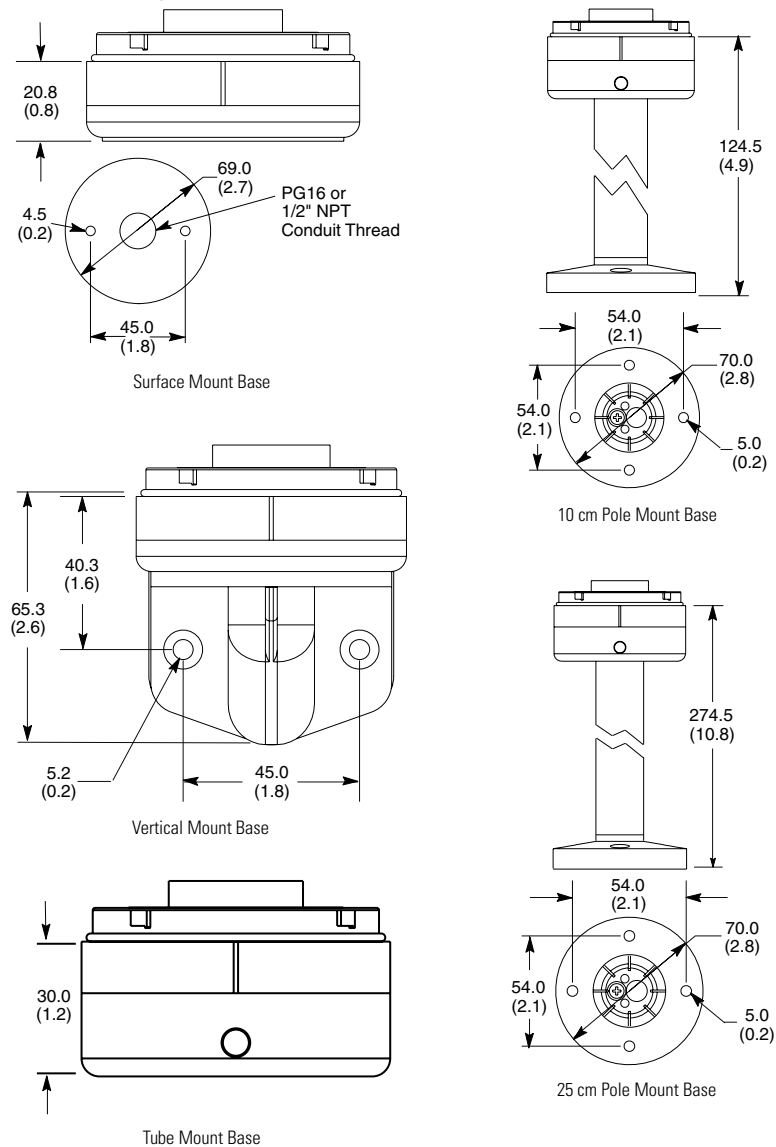
To set the DeviceNet node address:

1. Set Most Significant Digit (MSD) Switch, switch 2 (S2), to tens position. For example, if the desired node address is 27, set switch 2 (S2) to 2.
2. Set Least Significant Digit (LSD) Switch, switch 1 (S1), to ones position. For example, if the desired node address is 27, set switch 1 (S1) to 7.
3. If software programmability is desired, set the node address to 64 or greater. This disables both switches and allows programming through the network. Software will default to 63.

DeviceNet Stack Light Base Dimensions

Figure 3.4 shows the dimensions of the Stack Light Bases. Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

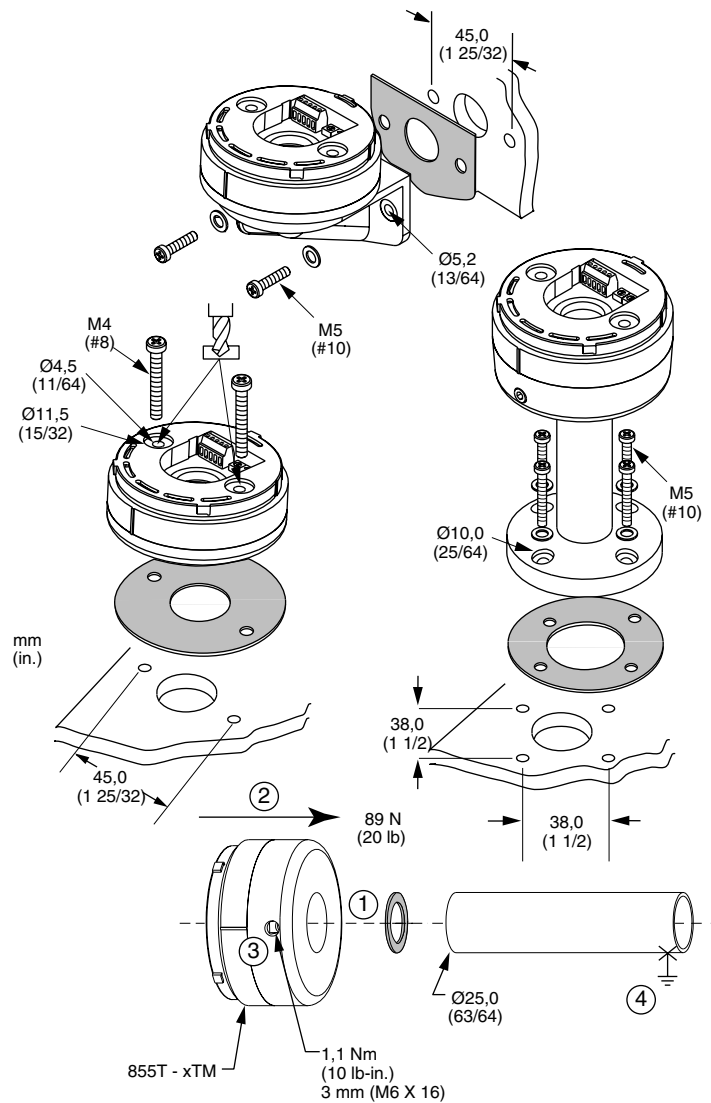
Figure 3.4 Stack Light Base Dimensions



Mounting the DeviceNet Stack Light

Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Figure 3.5 Stack Light Mounting



Operations

Chapter Objectives

This chapter contains the following sections:

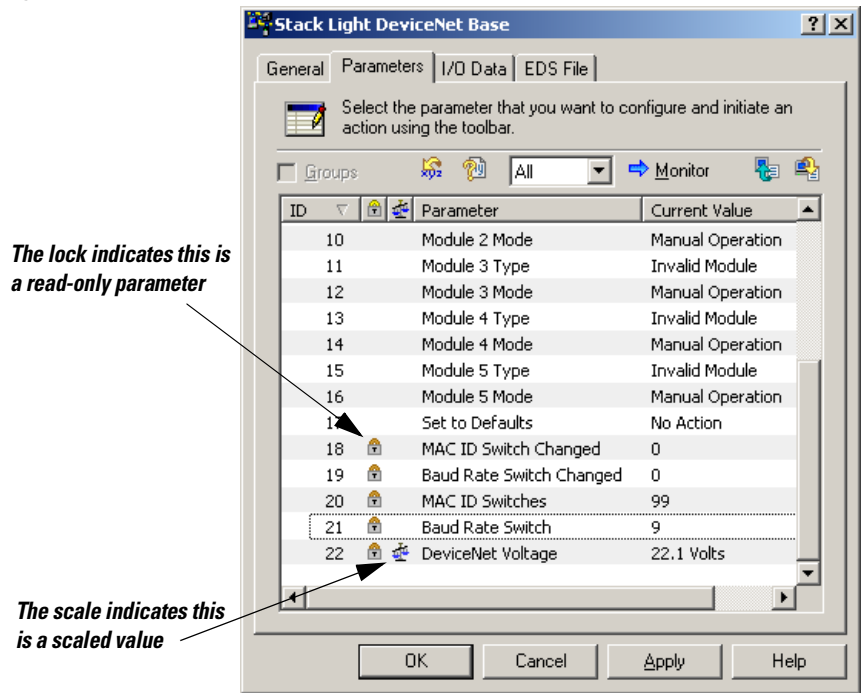
Table 4.A

Section	Page	Section	Page
Parameter Configuration	4-1	I/O Configuration	4-7

Parameter Configuration

There are 22 parameters available for monitoring in the Bulletin 855T DeviceNet Stack Light, 17 of which can be changed. Configuration of the parameters is accomplished through the use of RSNetWorx for DeviceNet. The following illustration helps explain which parameters are configurable and which are for monitoring.

Figure 4.1



The following tables give a brief explanation of the individual parameters and their uses:

Parameter 1 — Autobaud Enable

When enabled, the stack light automatically communicates at the network baud rate detected at power-on. When disabled, the baud rate must be set correctly by the user during node commissioning. This parameter's setting takes effect after a module reset or at power-on.

Note: Only valid when rotary switch is set between 3...9. The default value is Enabled.

Table 4.B

Value	Function	Value	Function
0	Enabled	1	Disabled

Parameter 2 — Off-to-On Delay

The Off-to-On delay determines the amount of time for which an input signal must be fully present before the stack light updates the I/O. It is a means of filtering for noise on input lines. The value must be set in units of microseconds. The default is set to 0 μ s to ensure proper filtering on noisy lines, but it can be reduced depending on the application. (Not Used)

Table 4.C

Value (μ s)	Function	Value (μ s)	Function
0	0 ms delay	8000	8 ms delay
2000	2 ms delay	16000	16 ms delay
4000	4 ms delay		

Parameter 3 — On-to-Off Delay

The On-to-Off delay determines the amount of time for which an input signal must be fully absent before the stack light updates the I/O. It is a means of filtering for noise on input lines. The value must be set in units of microseconds. The default is set to 0 μ s to ensure proper filtering on noisy lines, but it can be reduced depending on the application. (Not Used)

Table 4.D

Value (μ s)	Function	Value (μ s)	Function
0	0 ms delay	8000	8 ms delay
2000	2 ms delay	16000	16 ms delay
4000	4 ms delay		

Parameter 4 — Fault State

This parameter tells the stack light what to do with the output in the case of a fault state. If “Go to Fault Value” is selected, the device refers to the Fault Value parameter to determine the state. If “Hold Last State” is selected, the output stays in the last state. The default value is 0 — Go to Fault Value.

Table 4.E

Value	Function	Value	Function
0	Go to Fault Value	1	Hold Last State

Parameter 5 — Idle State

This parameter tells the stack light what to do with the output in the case of an idle state (an I/O connection exists, but the master is in program mode or idle state). If “Go to Idle Value” is selected, the device refers to the Output Idle Value parameter to determine the state. If “Hold Last State” is selected, the output stays in the last state. The default value is 0 — Go to Idle Value.

Table 4.F

Value	Function	Value	Function
0	Go to Idle Value	1	Hold Last State

Parameter 6 — Reserved

Reserved for future use.

Parameters 7, 9, 11, 13, 15 — Module Type

IMPORTANT

Although it is allowed, it is not recommended that strobe, sound, or flashing modules be used with modes that flash.

In normal operation the device will permit configuration of each module type. The default type is 8, Invalid Module.

Table 4.G Module Type

Type	Module	Type	Module
0	Incandescent	5	Combination Strobe/Sound
1	LED	6	Single Tone Sound
2	Strobe	7	Dual Tone Sound
3	Combination Incandescent/Sound	8	Invalid Module
4	Combination LED/Sound	—	—

IMPORTANT

The module type list is abbreviated. If the module is a rotating, flashing, or steady LED, then select the LED as the module type. If the module type is a flashing incandescent, then select Incandescent as the module type. The same logic applies to combination light/sound type modules.

Parameters 8, 10, 12, 14, 16 — Module Mode

Table 4.H Operating Modes

Mode	Function
0	Self Test
1	For Future Use
2	For Future Use
3	Follows Module status LED
4	Follows Network status LED
5	Manual Operation, controlled by network (PLC/PC)
6	For Future Use
7	For Future Use
8	IEC Fast Rate flash: 2 Hz, 50% duty cycle
9	For Future Use
10	For Future Use
11	IEC Slow Rate flash: 0.6 Hz, 50% duty cycle
12	For Future Use
13	For Future Use
14	Horn cycle: 30 s ON/10 s OFF
15	WALK: Sequence with other Mode 15 lights as: 1;2;3;4;5;1;2;...
16	STACK: Sequence with other Mode 16 lights as: 1;1&2;1&2&3;...;1&2&3&4&5;1
17	Binary count displayed on available Lamps
18	Odd/Even IEC Fast Rate Flash — All even number lights flash opposite all odd number lights.
19...255	Reserved

Parameter 17 — Set to Defaults

This parameter can be used to return the Bulletin 855T stack light to the “out of the box” settings. This is the easiest way to clear an unwanted configuration. The default is No Action.

Table 4.I

Value	Function	Value	Function
0	No Action	1	Reset

Parameter 18 — MAC ID Switch Changed

This is a read-only parameter used to determine whether the Node Address switches have been changed since the last power up. If the switches have been changed this bit will be set. The default is 0 — No Changes.

Table 4.J

Value	Function	Value	Function
0	No changes	1	Switches have changed

Parameter 19 — Baud Rate Switch Changed

This is a read-only parameter used to determine whether the baud rate switch has been changed since the last power up. If the switch has been changed this bit will be set. The default is 0 — No Changes.

Table 4.K

Value	Function	Value	Function
0	No changes	1	Switch has changed

Parameter 20 — MAC ID Switch Value

This is a read-only parameter used to identify the physical setting on the Node Address switches. This is helpful because the enclosure does not need to be opened. The default is 99.

Table 4.L

Value	Function
0...99	Value of switches

Parameter 21 — Baud Rate Switch Value

This is a read-only parameter used to identify the physical setting on the baud rate switch. This is helpful because the enclosure does not need to be opened. The default is 9.

Table 4.M

Value	Function
0...9	Value of switch

Parameter 22 — DeviceNet Voltage

This read only parameter is used for monitoring the DeviceNet voltage at the node. The voltage reported via Parameter 22 may vary from actual voltage by up to 1V DC.

I/O Configuration

The I/O messaging is set up by the master device through client/server connections at power-up. This device supports both Change-of-State (COS), cyclic, and Polled I/O messaging connections. The default I/O size is one input byte and one output byte with a polled I/O connection

The Output command is defined as follows:

Table 4.N Output Command Byte

Bit Number	Function When = 1	Function When = 0
7	—	—
6	—	—
5	—	—
4	Output 5 Execute	Output 5 Idle
3	Output 4 Execute	Output 4 Idle
2	Output 3 Execute	Output 3 Idle
1	Output 2 Execute	Output 2 Idle
0	Output 1 Execute	Output 1 Idle

Table 4.O Input Byte

Bit Number	Function When = 1	Function When = 0
7	—	—
6	—	—
5	—	—
4	Position 5 Idle, Not Present, or Burned Out	Position 5 Normal
3	Position 4 Idle, Not Present, or Burned Out	Position 4 Normal
2	Position 3 Idle, Not Present, or Burned Out	Position 3 Normal
1	Position 2 Idle, Not Present, or Burned Out	Position 2 Normal
0	Position 1 Idle, Not Present, or Burned Out	Position 1 Normal

Error Mode

Errors are critical and non-critical.

Table 4.P

Error Type	Description
Critical (non-recoverable)	• Failure of diagnostic tests during power-up/reset mode • Duplicate node address detected • Incorrect data rate
Non-Critical (recoverable)	• Pilot lamp burned out/module missing (power must be cycled to reset Status Byte once lamp is changed) • I/O connection timeout

Refer to the troubleshooting chart in Chapter 5 for details on how to recover from an error.

Resetting the Device

To reset the 855T Control Tower Stack Light, you must cycle power to the unit or disconnect the DeviceNet Cabling.

DeviceNet Operations

The Allen-Bradley 1747-SDN, 1771-SDN, and 1756-DNB DeviceNet Scanner Modules are master devices on the DeviceNet Network. The 855T Control Tower Stack Light supports the Master/Slave Connection Set for master/slave communications on the DeviceNet Network.

To communicate with 855T Control Tower Stack Light, the DeviceNet Scanner Module must be configured with the stack light:

- Node Address
- Input bytes (1)
- Output bytes (1)

The DeviceNet Scanner Module:

- connects to the 855T Control Tower Stack Light slave device.
- performs appropriate connection configuration.
- polls the 855T Control Tower Stack Light for I/O.

Troubleshooting and Maintenance

Chapter Objectives

This chapter contains the following sections:

Table 5.A

Section	Page	Section	Page
Preventive Maintenance	5-1	Troubleshooting	5-2
LED Indicators	5-2	Bulb Burnout	5-3

Preventive Maintenance

- Prevent accumulation of dust and dirt by:
 - keeping the base clean.
 - keeping modules installed on base with o-rings.
- Periodically check for loose connections.

ATTENTION

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

LED Indicators

LED indicators are provided in this design and can be mapped to modules. The functions are defined below:

Table 5.B

Indication	What To Do:
Module LED	
Off	No power applied to device
Green	Device operating normally
Flashing Green	Device needs commissioning due to configuration missing, incomplete, or incorrect
Flashing Red	Recoverable fault
Red	Unrecoverable fault may require device replacement
Flashing Red/Green	Device is in self-test
Network LED	
Off	Device is not on-line - Device has not completed dup_MAC_id test - Device not powered - check module status indicator
Green	Device on-line and has connections in the established state
Flashing Green	Device is on-line but has no connections in the established state
Flashing Red	One or more I/O connections in timed-out state
Red	Critical link failure - failed communication device. Device detected error that prevents it from communicating on the network.
Flashing Red/Green	Communication faulted device - the device has detected a network access error and is in communication faulted state. Device has received and accepted an identity Communication Faulted Request - long protocol message.

Troubleshooting

The 855T Control Tower Stack Light goes through a power-up sequence when power is cycled. It first goes through an internal memory check; if it passes this stage each of the outputs is powered for 200 ms. If this does not occur, there is an internal fault with the device or the modules are not connected properly. Check the modules for a good connection and cycle power. If fault still exists, return the 855T Control Tower Stack Light for repair.

After power-up the device tries to connect to the network. The data rate is selected through a rotary switch; if the data rate is incorrect the device will fault. Disconnect the device, change the switch setting, and reapply power. If the data rate is unknown, Autobaud may be selected and the device will select the correct data rate. (Note that this option can only be used with a running network. It cannot be used for node commissioning.) (Autobaud will not work if it is disabled through the parameter setup.)

Once the baud rate is set, the device issues a duplicate MAC ID check. If there is a duplicate node on the network, the 855T Control Tower Stack Light will fault. Disconnect the device, change the node address to an available one, and reapply power.

If the stack light or network resets when multiple outputs are turned on, it is likely due to inadequate network power supply. This device has a high power consumption when used with incandescent modules. Refer to the *DeviceNet Media Design Installation Guide*, Publication DNET-UM072*-EN-P to make sure the power supply sizing and placement are correct.

Bulb Burnout

Bulb Burnout is reflected in the Status Byte returned from the device. This feature only works with incandescent modules or incandescent/sound combination modules. The current draw of other module types is too low to sense correctly.

For burnout detection to work properly, the module type parameter must be configured by the user. This can be done with the RSNetWorx for DeviceNet Software. If a module is misconfigured, it may be reflected as a burnout in the Status Byte.

In order to clear the Status Byte, change the bulb and cycle power. If this does not clear the fault, verify correct configuration of the module type parameter.

Off-Line Node Recovery

Chapter Objectives

Table 6.A

Section	Page	Section	Page
Overview	6-1	Sample Recovery	6-2

Overview

The Bulletin 855T Stack Light is equipped with a function known as Off-Line Node Recovery. Off-Line Node Recovery is used mainly to commission a device on a network. When a new product is put on the network, it is at a default address of Node 63. If multiple units are placed on a network without first using node commissioning to change the node address a duplicate MAC ID error occurs. This means that more than one device is located at the same node address and only one of them is allowed online. Off-Line Node Recovery now allows you to recover the faulted devices and change the node address. This is a powerful tool because multiple nodes can be put on the network on installation and recovered one at a time without having to continually reset the network. The following section will walk through a sample recovery.

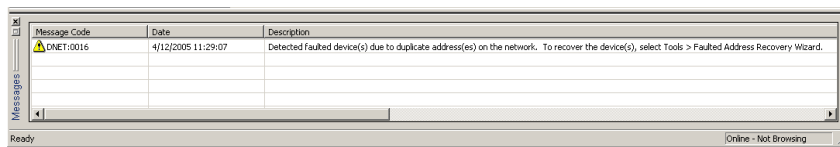
Note: If the MAC ID is set through the rotary switches, Off-Line Node Recovery will not be able to recover the faulted device because it cannot change the node address.

Sample Recovery

This example has placed two Bulletin 855T Stack Lights on a network at the same node address63.

From RSNetWorx, click the *Single Pass Browse* button. The following message will appear in the message box at the bottom of the screen.

Figure 6.1

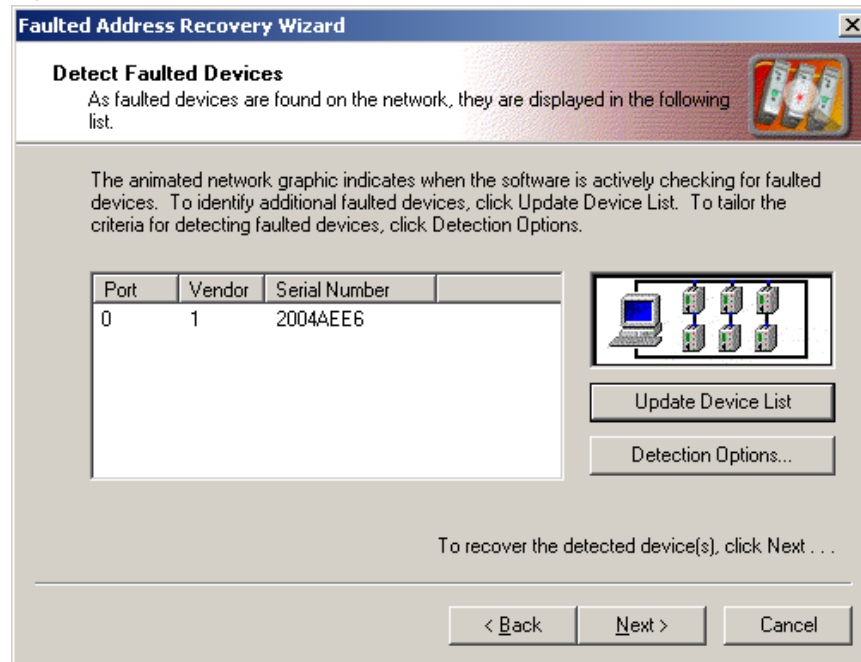


Select *Faulted Address Recovery Wizard* from the **Tools** menu.

Figure 6.2

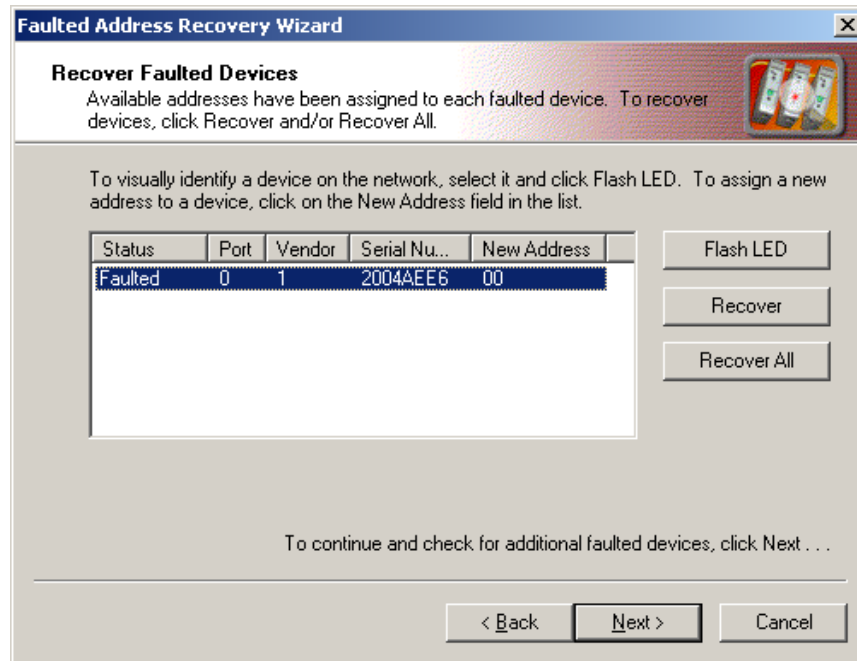


Click the *Next* button.

Figure 6.3

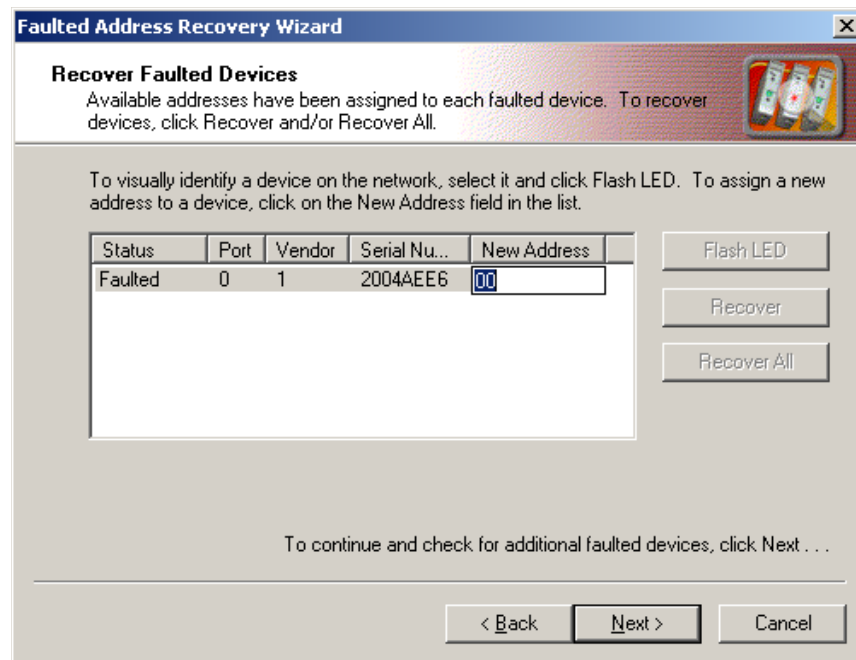
If there are multiple faulted devices, they will show up in the list. Devices are identified by the DeviceNet serial number that is unique to every product. The serial number for the Bulletin 855T Stack Light can be located on the nameplate or inside the product. Click the *Next* button.

Figure 6.4



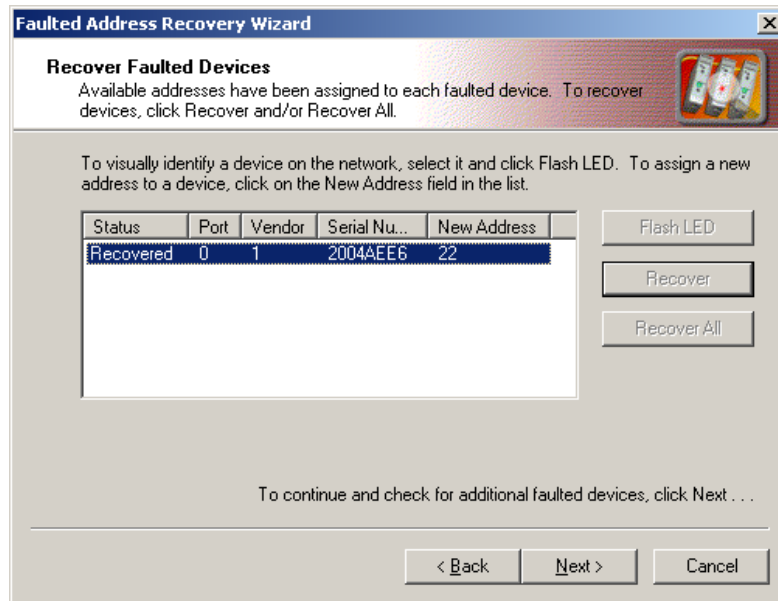
If there are multiple faulted units, you can verify which unit you are recovering by flashing the Net Status LED. To do this click *Flash LED*. The LED will flash between red and green. Click "00" under *New Address* to change the new address.

Figure 6.5

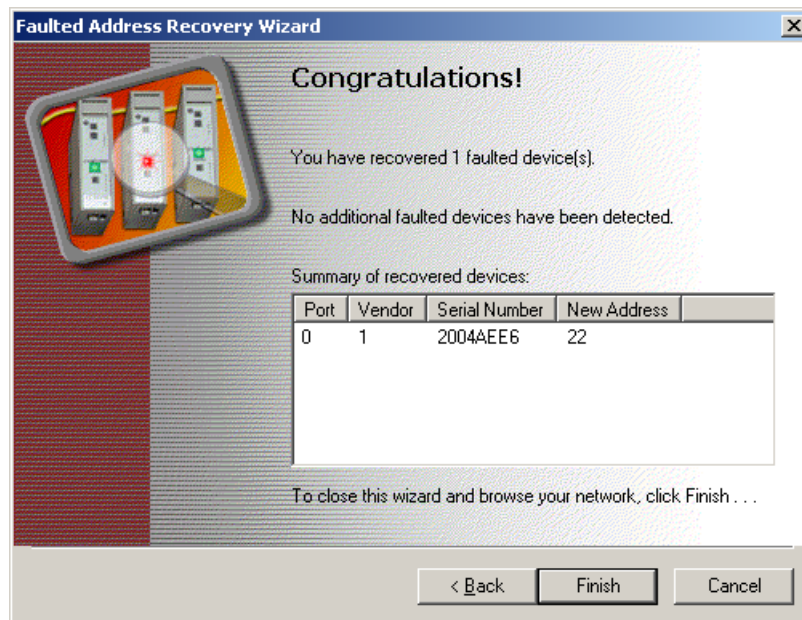


Change the address to the new address (for example, 22) and click *Recover*. Recovery is now complete.

Figure 6.6



For more information on Off-Line Node Recovery refer to the *RSNetWorx for DeviceNet User Manual* (Publication 1787-6.5.3).



Specifications

Table A.1

Mechanical Ratings			
Materials of Construction			
Part Description	Material	Relative Thermal Index	Flammability Rating
Bases, Cap	Lexan 940 (polycarbonate), black, manufacturer GE Plastics	120°C	94V-0
	Lexan 943 (polycarbonate), gray, manufacturer GE Plastics	120°C	94V-0
Rubber Gaskets	Perbunan NBR 70 (nitrile), manufacturer Freudenberg	110°C max. use temperature	—
Rubber O-Ring	HNBR 70 (nitrile), manufacturer Angst + Pfister	150°C max. use temperature	—
Pole (for pole base)	Aluminum	—	—
Plastic Washers	Polypropylene	—	—
Strain Relief Grommet	Neoprene 50 Durometer, manufacturer Kuehn Rubber Corp.	—	—
DeviceNet Cables	Cable jacket is yellow CPR chlorinated polyethylene, molded connector is yellow Santoprene	—	—
Shock			
Wave Shape		1/2 cycle sine wave	
Duration		11 ms	
Frequency		Three times in each axis	
Maximum Allowable G Force	Operational	30 G	
	Non-operational	50 G	
Vibration			
Axis Definitions		three mutually perpendicular axes	
Frequency		5...2000 Hz	
Duration		2 hrs each axis	
Maximum Allowable G Force	Operational	2.5 G	
	Non-operational	5 G	

Table A.1

Environmental Ratings	
Ingress Ratings	
Pole bases	NEMA Type 4/13, IP65
All other	NEMA Type 4/4X/13, IP65
Temperature Ratings	
Operating Temperature	–25...+70°C
Storage Temperature	–40...+85°C
Relative Humidity (Non-Condensing)	0...95% humidity
Electrical Ratings	
Supply Voltage	The DeviceNet Base operates at 11...25V.
Power Consumption Maximum with five modules	36 W, 1.75 W in idle mode
Outputs (Modules)	Up to five modules will be supported. The voltage and current rating is 24V DC/300 mA maximum. All standard 24V module types will be supported. Refer to 855T catalog for module-specific information.
DeviceNet Connection Cables	Three styles of DeviceNet connection cables will be supported. A one meter micro-style connector, a one meter mini-style connector, and a two meter open-style cable will be supported. They will consist of a 22 AWG drain wire, a 24 AWG twisted pair for communications, and a 22 AWG twisted pair for power. There is a 3 A maximum rating on the power pair.
Flash Upgrade Frequency	Memory may be upgraded 100 times without corruption of data.
Communications	
Data Rates	125 KB, 250 KB, and 500 KB
Distances	
500 m (1600 ft)	125 KB
200 m (600 ft)	250 KB
100 m (300 ft)	500 KB

Certifications

UL, CUL, and CE marked for all applicable directives. CE standards include EN55011, EN50081-2, EN50082-2, and EN60947-5-1. This product is intended for use in an industrial environment.

Special Notes

Refer to the *Signaling Solutions Selection Guide* (Publication 855-SG001*-EN-P) or the Industrial Controls Catalog for module-specific information.

DeviceNet Information

General Information

The 855T-Dxx (Multifunction I/O) device operates as a slave on the DeviceNet network. The unit 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).

The device supports five discrete outputs, one for each possible stack position.

Message Types

As a group 2 slave device, the 855T-Dxx supports the following message types.

Table B.1 Supported Message Types

CAN Identifier	Group 2 Message Type
10xxxxx111	Duplicate MAC ID Check Messages
10xxxxx110	Unconnected Explicit Request Messages
10xxxxx101	Master I/O Poll Command Message
10xxxxx100	Master Explicit Request Message

xxxxxx = Node Address

Class Services

As a group 2 slave device, the 855T-Dxx supports the following class services and instance services.

Table B.2 Class Services

Service Code	Service Name	Service Code	Service Name
14 (0x0E)	Get Attribute Single	75 (0x4B)	Allocate Group 2 Identifier Set
16 (0x10)	Set Attribute Single	76 (0x4C)	Release Group 2 Identifier Set

Object Classes

The 855T-Dxx device supports the following DeviceNet object classes.

Table B.3 Supported Objects

Class	Object	Class	Object
01 (0x01)	Identity	09 (0x09)	Digital Output Point
02 (0x02)	Message Router	15 (0x0f)	Parameter
03 (0x03)	DeviceNet	29 (0x1d)	Discrete Input Group
04 (0x04)	Assembly	30 (0x1e)	Discrete Output Group
05 (0x05)	Connection	43 (0x2b)	Acknowledge Handler
08 (0x08)	Digital Input Point	161 (0xa1)	Non-Volatile Storage

Class Code 001 (0x01): Identity Object

The Identity Object is required on all devices and provides identification of and general information about the device.

Class Attributes

None

B-3 DeviceNet Information

Instance Attributes

Table B.4

Attribute	Access	Name	Type	Value
1	Get	Vendor	UINT	1
2	Get	Product Type	UINT	7
3	Get	Product Code	UINT	756
4	Get	Revision Major Revision Minor Revision	STRUCT OF USINT USINT	2 05
5	Get	Device Status	UINT	❶
6	Get	Serial Number	UINT	❷
7	Get	Product Name Length Name	Structure of: USINT STRING [Length]	27 "Tower Light I/O 2-in/5-out"

❶ Device Status

bit 0	Owned	0 = not owned; 1 = owned (allocated)
bit 1	Reserved	0
bit 2	Configured	0
bit 3	Reserved	0
bit 4...7	Vendor-Specific	0
bit 8	Minor Cfg. Fault	0 = no fault; 1 = minor fault
bit 9	Minor Dev. Fault	0 = no fault; 1 = minor device fault
bit 10	Major Cfg. Fault	0 = no fault; 1 = major cfg. fault
bit 11	Major Dev. Fault	0 = no fault; 1 = major device fault
bit 12...15	Reserved	0

❷ Unique serial number

Common Services

Table B.5

Service Code	Class	Instance	Service Name
05 (0x05)	No	Yes	Reset
14 (0x0E)	No	Yes	Get_Attribute_Single

Class Code 002 (0x02): Message Router Object

The Message Router Object provides a messaging connection point through which a client may address a service to any object class or instance residing in the physical device.

Class Attributes

None

Instance Attributes

None

Common Services

None

Class Code 003 (0x03): DeviceNet Object

The DeviceNet Object is used to provide the configuration and status of a physical attachment to DeviceNet. A product must support **only one** DeviceNet Object per physical network attachment.

*Class Attributes***Table B.6**

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	2

*Instance Attributes***Table B.7**

Attribute	Access	Name	Type	Value
1	Get/Set	MACID	USINT	❶
2	Get/Set	Baud Rate	USINT	❷
3	Get/Set	Bus Off Interrupt	BOOL	❸
4	Get/Set	Bus Off Counter	USINT	❹
5	Get	Allocation Information Choice Byte Master's Node Addr	STRUCT of: BYTE USINT	❺
6	Get	MAC ID Switch Changed	BOOL	0 = No Change 1 = Change since last Reset or Power-Up
7	Get	Baud Rate Switch Changed	BOOL	0 = No Change 1 = Change since last Reset or Power-Up
8	Get	MAC ID Switch Value	USINT	0...99 0...63 Hardware Set 64...99 Software Configurable
9	Get	Baud Rate Switch Value	USINT	0...9 0...2 Hardware Set 3...9 Software Configurable
100 (0x64)	Get/Set	Disable Autobaud	BOOL	❻

- ❶ The MACID is set using two BCD rotary switches located on the module top. Valid MACID addresses are 0...63 (0...3F Hex). Setting the switch address to a value greater than 63 will disable the switch and allow software setting of the MACID. The software setting defaults to 63.
- ❷ The Baud Rate is set using a BCD rotary switch located on the module top. Valid Baud Rate settings are 0, 1, and 2; these correspond to 125 KB/s, 250 KB/s, and 500 KB/s respectively. Setting the switch address to a value of 3 will disable the switch and allow autobauding.
- ❸ Bus Off Interrupt (BOI) determines the action if a Bus Off state is encountered.

BOI	Action	BOI	Action
0	Hold chip in OFF state (default)	1	If possible reset CAN chip

- ❹ Bus Off Counter will be forced to 0 whenever set regardless of the data value provided.
- ❺ Allocation_byte

bit 0	Explicit messaging	bit 4	COS I/O
bit 1	Polled I/O	bit 5	Cyclic I/O
		bit 6	Acknowledge Suppression

- ❻ Disable Autobaud

0	Autobauding Enabled	1	Autobauding Disabled
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*Common Services***Table B.8**

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single
75 (0x4B)	No	Yes	Allocate_Master/Slave
76 (0x4C)	No	Yes	Release_Master/Slave

Class Code 004 (0x04): Assembly Object

The Assembly Objects bind attributes of multiple objects to allow data to or from each object to be sent or received over a single connection.

*Class Attributes***Table B.9**

Attribute	Access	Name	Type	Value
2	Get	Max Class ID	UINT	104 (0x68)

*Instance Attributes***Table B.10 Assembly Object, Instance 100 Attributes**

Attribute	Access	Name	Type	Value
3	Set	Data	BYTE	❶
	Get	State	BYTE	❷

- ❶ The Assembly Data Byte consists of five bits, starting at bit 0. Each bit corresponds to a station position in the stack. 1 = ON/ACTIVE.
- ❷ The Assembly Status Byte consists of five bits. Each of the lower five bits, starting at bit 0, corresponds to a station position in the stack. 1 = Failed.

Table B.11 Assembly Object, Instance 104 Attributes

Attribute	Access	Name	Type	Value
3	Get/Set	Data Off_delay On_delay Autobaud DOG_Fault_State DOG_Idle_State	STRUCT of: UINT UINT BOOL BOOL BOOL	❶ ❷ ❸ ❹ ❺

- ❶** The data for off_delay is time in microseconds, valid values: 0, 2000, 4000, 8000, 16000.
- ❷** The data for on_delay is time in microseconds, valid values: 0, 2000, 4000, 8000, 16000.
- ❸** Disable Autobaud: 0 = Enabled, 1 = Disabled
- ❹** Fault State: 0 = Reset Outputs, 1 = Hold Last State
- ❺** Idle State: 0 = Reset Outputs, 1 = Hold Last State

Common Services

Table B.12

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 0x0005: Connection Object

No class attributes will be supported for the Connection Object.

Three instances of the Connection Object will be supported. Instance 1 will be the explicit message connection, instance 2 will be the polled IO connection, and instance 4 will be the COS/Cyclic IO connection.

Instance 1 is the Predefined Group 2 Connection Set Explicit Message Connection. The following instance 1 attributes will be supported:

Table B.13

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	BYTE	0x83 — Server, Transport Class 3
4	Get	Produced Connection ID	UINT	10xxxxxx011 xxxxxx = node address
5	Get	Consumed Connection ID	UINT	10xxxxxx100 xxxxxx = node address
6	Get	Initial Comm. Characteristics	BYTE	0x22
7	Get	Produced Connection Size	UINT	0x61
8	Get	Consumed Connection Size	UINT	0x61
9	Get/Set	Expected Packet Rate	UINT	In milliseconds
12 (0C _{hex})	Get	Watchdog Action	USINT	01 = auto delete 03 = deferred delete
13 (0D _{hex})	Get	Produced Connection Path Length	UINT	0
14 (0E _{hex})	Get	Produced Connection Path	EPATH	Empty
15 (0F _{hex})	Get	Consumed Connection Path Length	UINT	0
16 (10 _{hex})	Get	Consumed Connection Path	EPATH	Empty

Instance 2 is the Predefined Group 2 Connection Set Polled I/O Message Connection. The following instance 2 attributes will be supported:

Table B.14

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	1 = I/O Connection
3	Get	Transport Class Trigger	USINT	0x82 — Server, Transport Class 2 (If alloc_choice != polled and ack suppression is enabled then value = 0x80)
4	Get	Produced Connection ID	UINT	01111xxxxx xxxxxx = node address
5	Get	Consumed Connection ID	UINT	10xxxxxx101 xxxxxx = node address
6	Get	Initial Comm. Characteristics	USINT	0x21
7	Get	Produced Connection Size	UINT	0...8
8	Get	Consumed Connection Size	UINT	0...8
9	Get	Expected Packet Rate	UINT	In milliseconds
12 (0C _{hex})	Get/Set	Watchdog Action	USINT	0 = transition to timed out 1 = auto delete 2 = auto reset
13 (0D _{hex})	Get	Produced Connection Path Length	UINT	6
14 (0E _{hex})	Get/Set	Produced Connection Path	—	20 04 24 (assy inst #) 30 03
15 (0F _{hex})	Get	Consumed Connection Path Length	UINT	6
16 (10 _{hex})	Get/Set	Consumed Connection Path	—	20 04 24 (assy inst #) 30 03
17 (11 _{hex})	Get/Set	Production Inhibit Time	UINT	—

Instance 4 is the Predefined Group 2 Connection Set Change of State/Cyclic I/O Message Connection. The following instance 4 attributes will be supported:

Table B.15

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	1 = I/O Connection
3	Get	Transport Class Trigger	USINT	0x00 (Cyclic, unacknowledged) 0x03 (Cyclic, acknowledged) 0x10 (COS, unacknowledged) 0x13 (COS, acknowledged)
4	Get	Produced Connection ID	UINT	01101xxxxx xxxxxx = node address
5	Get	Consumed Connection ID	UINT	10xxxxxx101 xxxxxx = node address
6	Get	Initial Comm. Characteristics	USINT	0x01 (acknowledged) 0x0F (unacknowledged)
7	Get	Produced Connection Size	UINT	0...8
8	Get	Consumed Connection Size	UINT	0...8
9	Get/Set	Expected Packet Rate	UINT	In milliseconds
12 (0C _{hex})	Get	Watchdog Action	USINT	0 = transition to timed out 1 = auto delete 2 = auto reset
13 (0D _{hex})	Get	Produced Connection Path Length	UINT	6
14 (0E _{hex})	Get	Produced Connection Path	—	20 04 24 (assy inst #) 30 03
15 (0F _{hex})	Get	Consumed Connection Path Length	UINT	4 (acknowledged) 0 (unacknowledged)
16 (10 _{hex})	Get/Set	Consumed Connection Path	—	20 04 24 (assy inst #) 30 03
17 (11 _{hex})	Get/Set	Production Inhibit Time	UINT	In milliseconds

Instance 5 is the Group 1 Explicit Message Connection. The following instance 5 attributes will be supported:

Table B.16

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	USINT	0x83 — Server, Transport Class 3
4	Get	Produced Connection ID	UINT	0????xxxxx xxxxx = node address
5	Get	Consumed Connection ID	UINT	0????xxxxx xxxxx = node address
6	Get	Initial Comm. Characteristics	USINT	0x22
7	Get	Produced Connection Size	UINT	0x61
8	Get	Consumed Connection Size	UINT	0x61
9	Get/Set	Expected Packet Rate	UINT	In milliseconds
12 (0C _{hex})	Get	Watchdog Action	USINT	01 = auto delete 03 = deferred delete
13 (0D _{hex})	Get	Produced Connection Path Length	UINT	0
14 (0E _{hex})	Get	Produced Connection Path	—	Empty
15 (0F _{hex})	Get	Consumed Connection Path Length	UINT	0
16 (10 _{hex})	Get	Consumed Connection Path	—	Empty

Instance 6 and 7 are the Group 3 Explicit Message Connections. The following instance 6 and 7 attributes will be supported:

Table B.17

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 1 = configuring 3 = established 4 = timed out
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	USINT	0x83 — Server, Transport Class 3
4	Get	Produced Connection ID	UINT	11???xxxxx xxxxxx = node address
5	Get	Consumed Connection ID	UINT	11???xxxxx xxxxxx = node address
6	Get	Initial Comm. Characteristics	USINT	0x22
7	Get	Produced Connection Size	UINT	0x61
8	Get	Consumed Connection Size	UINT	0x61
9	Get/Set	Expected Packet Rate	UINT	In milliseconds
12 (0C _{hex})	Get	Watchdog Action	USINT	01 = auto delete 03 = deferred delete
13 (0D _{hex})	Get	Produced Connection Path Length	UINT	0
14 (0E _{hex})	Get	Produced Connection Path	—	Empty
15 (0F _{hex})	Get	Consumed Connection Path Length	UINT	0
16 (10 _{hex})	Get	Consumed Connection Path	—	Empty

The following common services will be implemented for the Connection Object.

Table B.18

Service Code	Implemented for:		Service Name
	Class	Instance	
0x05	No	Yes	Reset
0x09	Yes	Yes	Delete
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Class Code 008 (0x08): Discrete Input Point Object

The Discrete Input Point (DIP) Object models discrete inputs in a product. You can use this object in applications as simple as a toggle switch or as complex as a discrete I/O control module. There is a separate instance for each discrete input available on the device.

Class Attributes

Table B.19

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	2

Instance Attributes

Table B.20

Attribute	Access	Name	Type	Value
3	Get	Value	BOOL	❶
4	Get	Status	BOOL	0

❶ State of the specific digital input.

Common Services

Table B.21

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single

Class Code 009 (0x09): Discrete Output Point Object

The Discrete Output Point (DOP) Object models discrete outputs in a product. You can use this object in applications as simple as an actuator or as complex as a discrete I/O control module. There is a separate instance for each discrete output available on the device.

Class Attributes

None

Instance Attributes

Table B.22

Attribute	Access	Name	Type	Value
3	Get/Set	Value	BOOL	State of Output ❶
4	Get	Status	BOOL	❷
128 (0x80)	Get/Set	Mode	BYTE	—
129 (0x81)	Get/Set	Module_Type	BYTE	—

❶ Output ON or OFF

❷ 0 = OK

1 = Burnout, Module Not Present

Common Services

Table B.23

Service Code	Class	Instance	Service Name
14 (0x0E)	No	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 015 (0x0F): Parameter Object

Use of the Parameter Object provides a known, public interface to a device's configuration data. In addition, this object also provides all the information necessary to define and describe each of a device's individual configuration parameters.

This object allows a device to fully identify a configurable parameter by supplying a full description of the parameter, including minimum and maximum values and a human-readable text string describing the parameter.

Class Attributes

Table B.24

Attribute	Access	Name	Type	Value
2	Get	Maximum Instance	UINT	—
8	Get	Parameter Class Descriptor	WORD	9 ❶
9	Get	Configuration Assembly Instance	UINT	—

❶ Parameter Class Descriptor Bit Values

Definition

0	Supports Parameter Instances
1	Supports Full Attributes
2	Must do non-volatile storage save command
3	Params are stored in non-volatile storage

*Instance Attributes***Table B.25**

Attribute	Access	Name	Type	Value
1	Get/Set	Parameter_Value	Specified in Data Type	—
2	Get	Link_Path_Size	USINT	6
3	Get	Link_Path	Array of BYTE	—
4	Get	Descriptor	WORD	0 ❶
5	Get	Data_Type	USINT	—
6	Get	Data_Size	USINT	—

❶ Semantics of Descriptor Instance Attribute

Bit	Definition	Meaning
0	Supports Settable Path	Indicates that link path can be set.
1	Supports Enumerated Strings	Indicates that enumerated strings are supported and can be read with Get_Enum_String service.
2	Supports Scaling	Indicates that the scaling factor should be implemented to present the value to the user in engineering units.
3	Supports Scaling Links	Indicates that the values for the scaling factor may be retrieved from other parameters.
4	Read Only Parameter	Indicates that the value attribute can only be read, and not set.
5	Monitor Parameter	Indicates that the value attribute is updated in real time by the device.
6	Supports Extended Precision Scaling	Indicates that the extended precision scaling factor should be implemented to present the value to the user in engineering units.

*Common Services***Table B.26**

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 029 (0x1D): Discrete Input Group Object

The Discrete Input Group (DIG) Object binds a group of discrete input points in a module. All points bound to the group share all attributes contained in the group. If an attribute is shared (points have the same attributes and the same attribute values) across more than one Discrete Input Point (DIP), then that attribute can be contained in a Discrete Input Group. A Discrete Input Point can be bound to more than one Discrete Input Group.

Class Attributes

None

*Instance Attributes***Table B.27**

Attribute	Access	Name	Type	Value
3	Get	Number of Instances	USINT	2
4	Get	Binding	Array of UINT	1,2
5	Get	Status	BOOL	0 = OK 1 = Alarm
6	Get/Set	On-Delay	UINT	—
7	Get/Set	Off-Delay	UINT	—

*Common Services***Table B.28**

Service Code	Class	Instance	Service Name
14 (0x0E)	No	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 030 (0x1E): Discrete Output Group Object

The Discrete Output Group (DOG) Object binds a group of discrete output points in a module. All points bound to the group share all attributes contained in the group. If an attribute is shared across more than one Discrete Output Point (DOP), then it can be contained in a Discrete Output Group. A Discrete Output Point can also be bound to more than one Discrete Output Group.

Class Attributes

None

Instance Attributes

Table B.29

Attribute	Access	Name	Type	Value
3	Get	Number of Instances	USINT	5
4	Get	Binding	Array of UINT	1,2,3,4,5
5	Get	Status	BOOL	0 = OK 1 = Alarm
6	Get/Set	Command	USINT	Get = 0 Set = 1 to activate group
7	Get/Set	Fault State	USINT	— ❶
8	Get	Fault Value	USINT	0
9	Get/Set	Idle State	USINT	— ❶
10 (0x0A)	Get	Idle Value	USINT	0

- ❶ 0 = Reset
1 = Hold Last State

Common Services

Table B.30

Service Code	Class	Instance	Service Name
14 (0x0E)	No	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 043 (0x2B): Acknowledge Handler Object

The Acknowledge Handler Object is used to manage the reception of message acknowledgements. This object communicates with a message producing Application Object within a device. The Acknowledge Handler Object notifies the producing application of acknowledge reception, acknowledge timeouts, and production retry limit.

Class Attributes

None

*Instance Attributes***Table B.31**

Attribute	Access	Name	Type	Value
1	Get/Set	Acknowledge Timer	UINT	—
2	Get	Retry Limit	USINT	—
3	Get	COS Producing Connection Instance	UINT	4

*Common Services***Table B.32**

Service Code	Class	Instance	Service Name
14 (0x0E)	No	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Class Code 0x00B4: DeviceNet Interface Object

This vendor-specific object will include no class attributes.

A single instance (instance 1) of the DeviceNet Interface Object will be supported. The following instance attributes will be supported.

Table B.33

Attribute ID	Access Rule	Name	Data Type	Min./Max.	Default	Description
19 (13 _{hex})	Get/Set	Set To Defaults	BOOL	0...1	0	0 = No action; 1 = Reset
30 (1E _{hex})	Get	DeviceNet Voltage	UINT	0...287	0	DeviceNet voltage supplied to 855T Stack Light

The following common services will be implemented for the DeviceNet Interface Object.

Table B.34

Service Code	Class	Instance	Service Name
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Notes

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