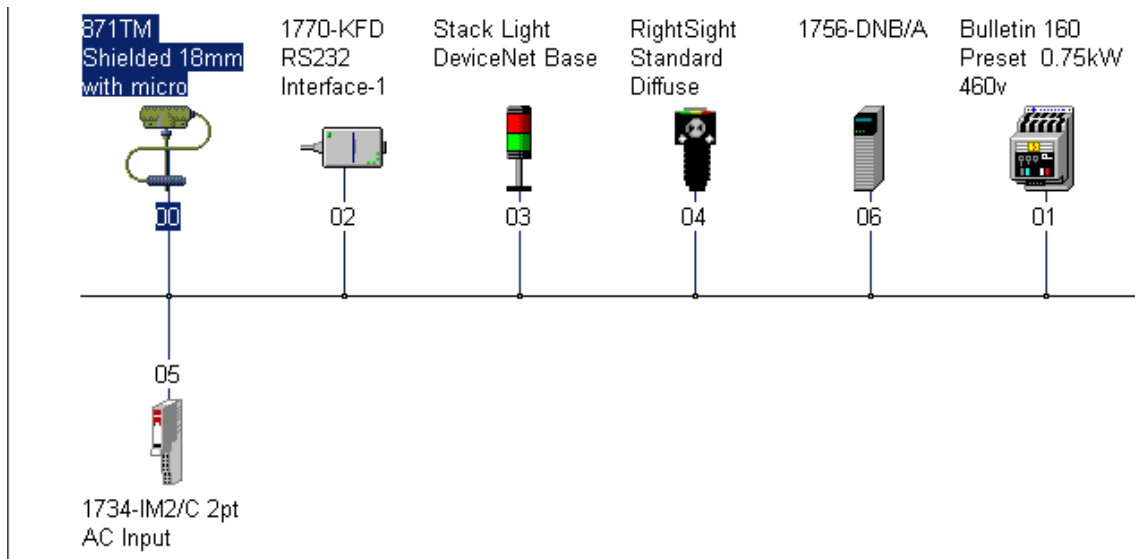


Module 5



DeviceNet

Handout

Node Commissioning

Student Materials

Student Materials for Module 5: Node Setup: Manual Configuration

Lesson Objective

By the end of this session, students should be able to:

1. Setup DeviceNet components with manual/software settings

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1756-DNB Manual Set-up	4
855T Stack Light Set-up.....	7
22-COMM-D Set-up.....	10
1791D- Compact I/O Block	13
RightSight Photoeye	14
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RSNetWorx File Used:

PLC220_Module5.dnt

Note: DeviceNet component Addresses may be different depending on Demo Board being used

Introduction:

There are multiple procedures for commissioning DeviceNet components.

Commissioning is setting the Node Address (MAC ID) and Data Rate (Baud Rate) in a component to communicate on a DeviceNet network.

Devices can use software or hardware (manual) methods for Node Commissioning. Some devices only use software (RightSight Standard Diffuse Photoelectric Sensor). Some device can use a combination of software and hardware (1791D-8B8P Compact I/O Block / 1756-DNB Scanner. Some devices, depending on settings can only use hardware for commissioning.

The Node Commissioning Tool in RSNetWorx for DeviceNet is used to configure devices thru software.

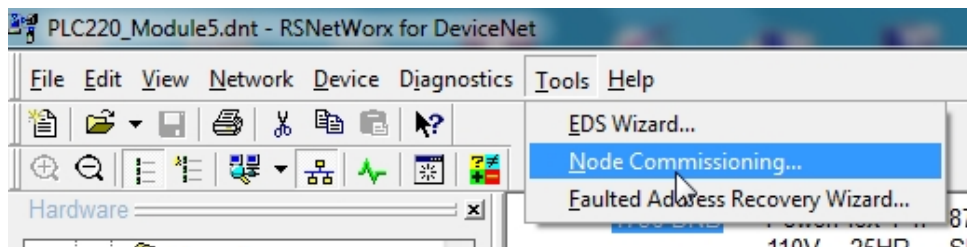


Figure 1-A
Node Commissioning Tool – RSNetWorx for DeviceNet

Note: Node Commissioning Tool can also be configured to run as a standalone utility.

Hardware (Manual) commissioning typically involves setting rotary or DIP switches.



Figure 2-A
Rotary Switches – Manual Setup

Note: Factory default (new devices – never used) Node Address settings for DeviceNet components is 63

Factory default (new devices – never used) -Components with Autobaud capability

will have Autobaud Enabled

Note; There are also other methods - See 1756-DNB Manual Setup

1756-DNB Manual Setup:

The 1756-DNB scanner module allows ControlLogix processors to interface with a DeviceNet network. The module face has an alphanumeric display, three diagnostic LEDs and one 6-pin open style port to connect to a network.

Some versions of the 1756-DNB have a dual purpose configuration button.

Open the door on the 1756-DNB module to view Configuration Pushbutton



Figure 3-A
1756-DNB Scanner

The configuration pushbutton serves two functions:

1. Manual set the 1756-DNB's MAC ID (node address)
2. Manual set the 1756-DNB's baud rate.

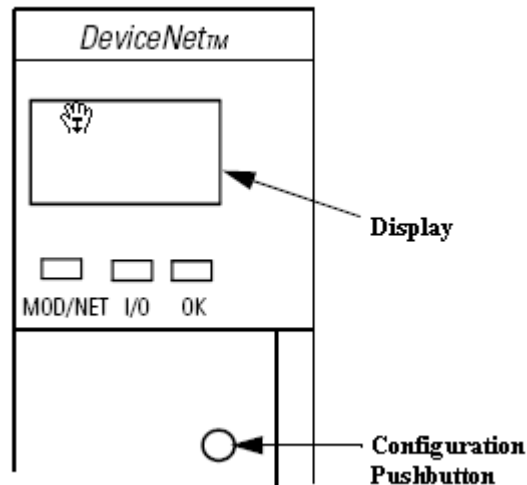


Figure 4-A

The MAC ID range is 0-63.

The available baud rates are 125k, 250k and 500k.

Set Module's Baud Rate:

1. Install module in the PLC chassis.
2. Apply power to the PLC chassis.
3. Make sure the DeviceNet cable is **NOT** connected to the module port.
4. The module's display should read - NO NETWORK POWER.
5. Hold down the Configuration Pushbutton.
6. After displaying some module information, the word BAUD will be displayed.
7. The display will cycle through the available baud rates – 125, 250, 500

8. The number with an asterisk to left is the current baud rate setting.

For example: *125 – the current baud rate of the module is 125k

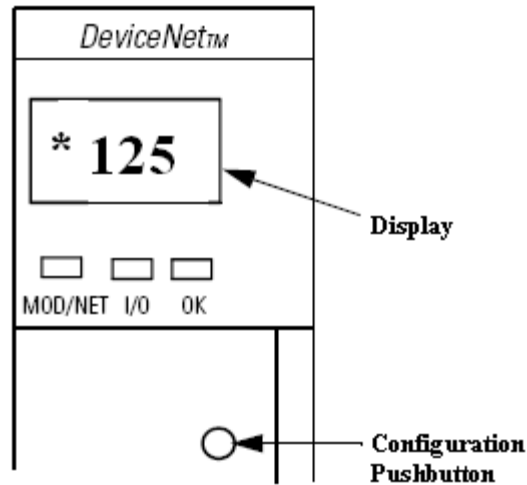


Figure 5-A

9. Release the configuration pushbutton when the display shows the baud rate setting for your network configuration. The new baud setting will now have an asterisk to the left of the value.

Set Module's MAC ID (Node Address):

1. Install module in the PLC chassis.
2. Apply power to the PLC chassis.
3. Make sure the DeviceNet cable is connected to the module port.
4. Make sure the network is powered.
5. The module's display should flash between A#XX and IDLE.
XX will be the current node address of the 1756-DNB.
For example: A#00 – MAC ID is NODE 0 on the network.

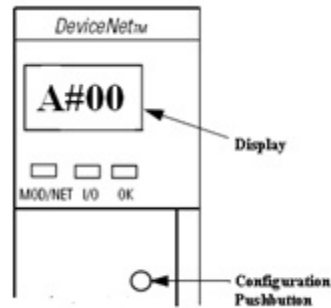


Figure 6-A

6. Hold down the Configuration Pushbutton.
7. Addr - will be displayed on the module.
8. The display will cycle from 00-63.
9. When the display value equals the required node address (MAC ID), release the configuration pushbutton.
10. The display will now flash between IDLE and A#XX, were XX is the new node address of the module.

855T Stack Light Manual Setup:

The 855T Stack Light connects directly to a DeviceNet network. The Stack Light needs an appropriate node address and baud rate to function on DeviceNet. The switches to configure settings for the 855T Stack Light are located in the base of the stack light.

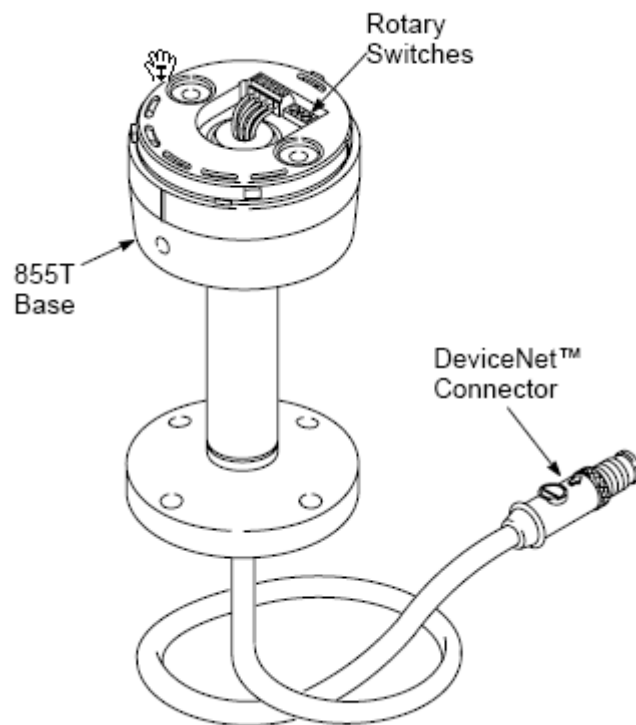


Figure 7-A

To view the rotary switches in the base, twist light module(s) to remove.
The 855T Stack Light base contains 3 small rotary switches and the network wiring.

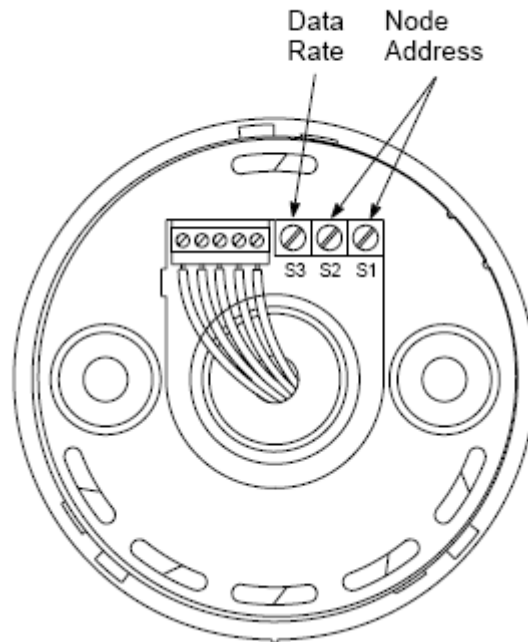


Figure 8-A – 855T Stack Light Base

Note: A small screwdriver is needed to change the 10 position rotary switches

Note: On some devices switch settings are only check during the Power –Up sequence
These are typically older revisions of components

On some devices switches are continually monitored

The label on the base shows the required information to set-up the 855T Stack Light.

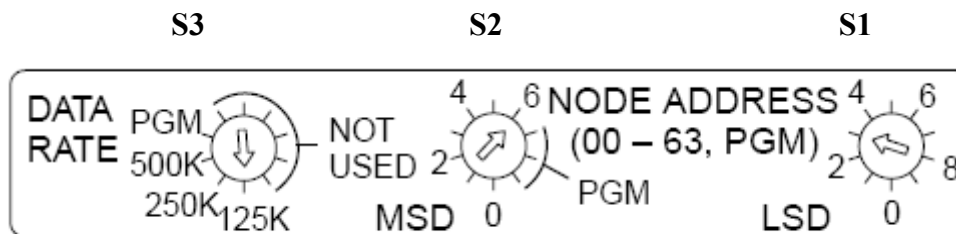


Figure 9-A

Switch S3 (DATA RATE) is the baud rate settings. The PGM allows baud rate configuration through RSNNetWorx Node Commissioning Tool software.

If Switch S3 is configured for 125K, 250K or 500K the Node Commissioning Tool software cannot be used to set the Data Rate

Switch S2 (MSD- Most Significant Digit) and Switch S1 (LSD – Least Significant Digit) are used to set the node address of the device.

Note: MSD – 10s position
LSD – 1s position

The settings on S2 of PGM allow for the node configuration through RSNetWorx- Node Commissioning Tool.

Note: S2 PGM position are the 7,8,9 positions of the rotary switch.

Devices with a valid Device Node Address based on the rotary switch settings, cannot have their Node Address configured using RSNetWorx- Node Commissioning Tool.

Devices with an improper rotary switch setting for a DeviceNet Network, i.e greater than 63 can then use RSNetWorx- Node Commissioning Tool to configure the Node Addresses

Typically component instructions will state - place the MSD and LSD switches to 99 position (each switch in the 9s position) to allow software (Node Commissioning Tool) configuration

Open PLC220_Module5.dnt file in RSNetWorx software – Offline
Right click the Stack Light icon – Select Properties

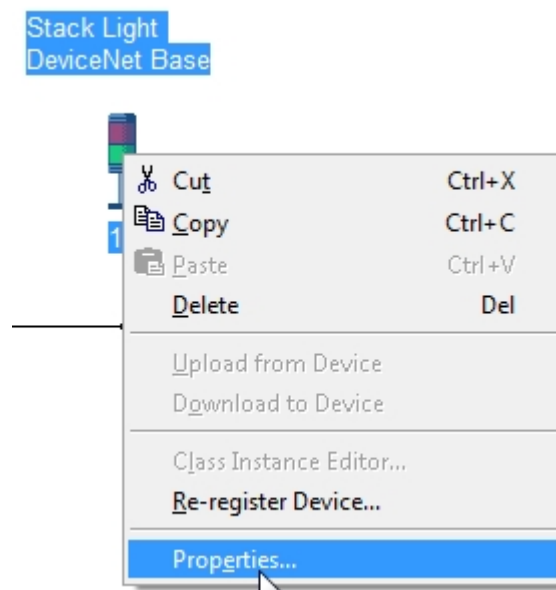


Figure 10-A

Stack Light Properties

Click the Parameters tab on the Stack Light Properties window
Scroll down the Parameter list to view Parameter 20 and 21

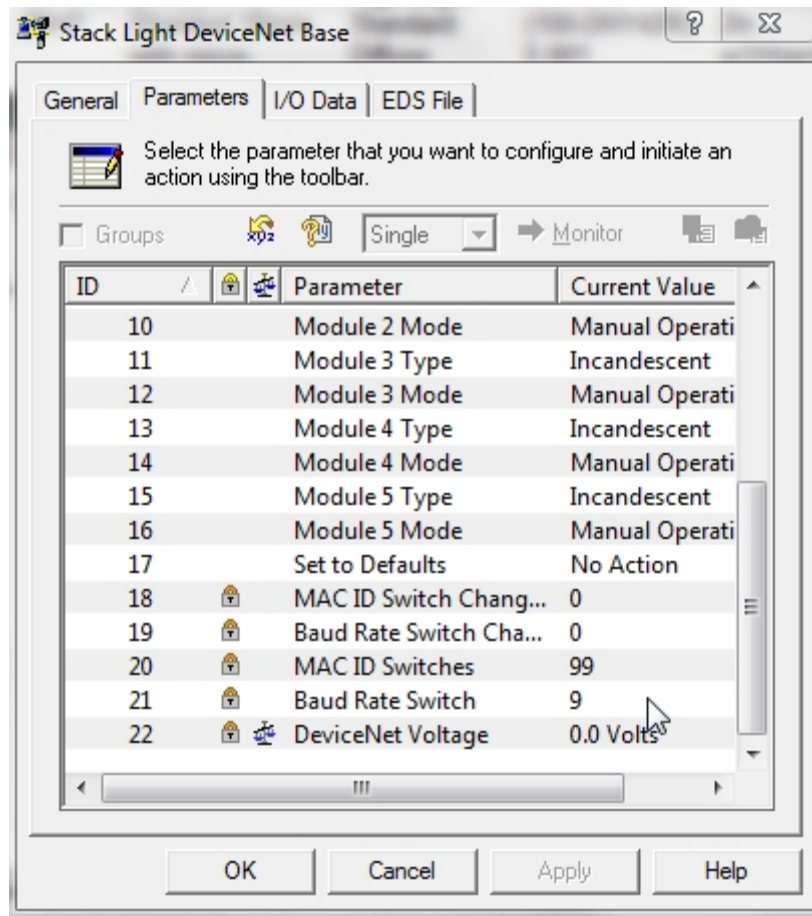


Figure 11-A
Stack Light Parameters

Parameter 20 will show the settings of the MAC ID – Node Address Switches S2 and S1
Parameter 21 will show the setting of the Data Rate Switch S3.

Note; Version 1 Stack Light DeviceNet Base components do not have these parameters

Note: See Chapter 3 - 855t-Stack_Light_User_Manual.pdf handout for additional information on rotary switch configuration

22-COMM-D DeviceNet Adapter Manual Set-up:

The 22-COMM-D DeviceNet Adapter allows a PowerFlex 4 / 40 AC Drive to be directly connected to a DeviceNet network. This interface module gives the drive its DeviceNet node address and communication speed. The module has an 8 switch DIP to configure the node address and the baud rate.

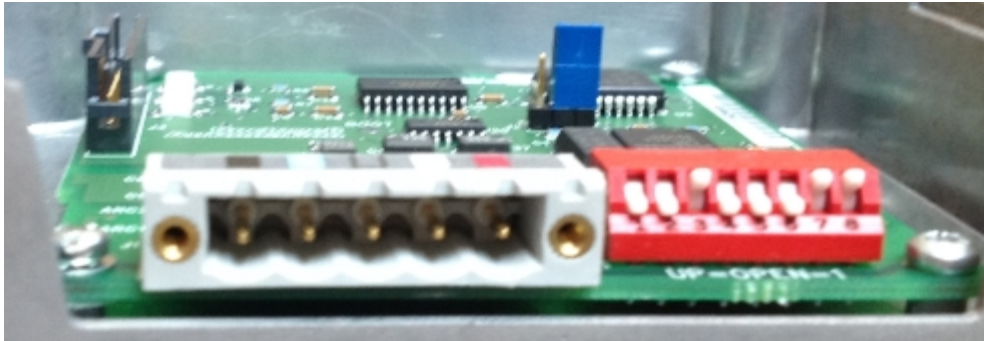


Figure 12-A
Device Configuration - DIP Switch

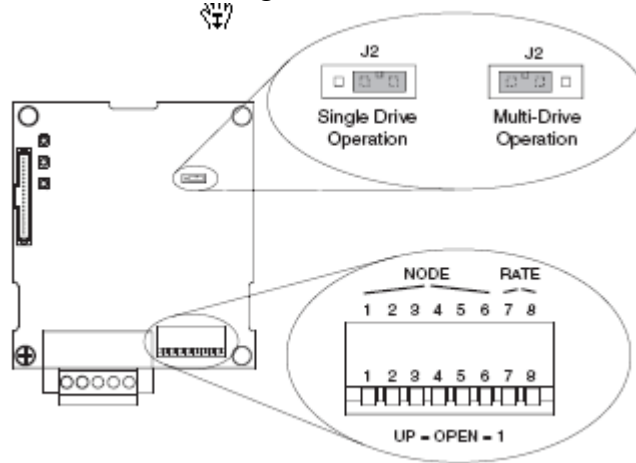


Figure 13-A

Default switch settings:

Switches	Description	Default
SW 1	Least Significant Bit (LSB) of Node Address	1
SW 2	Bit 1 of Node Address	1
SW 3	Bit 2 of Node Address	1
SW 4	Bit 3 of Node Address	1
SW 5	Bit 4 of Node Address	1
SW 6	Most Significant Bit (MSB) of Node Address	1
SW 7	Least Significant Bit (LSB) of Data Rate	1
SW 8	Most Significant Bit (MSB) of Data Rate	1

Figure 14-A

Note: Default Settings

Node (MAC ID) Address - 63

Data Rate (Baud Rate) - Autobaud

Switches 7-8 configure the baud rate.

Switch Setting		Data Rate
SW 7	SW 8	
0	0	125 kbps
1	0	250 kbps
0	1	500 kbps
1	1	Autobaud

Figure 15-A

Switches 1-6 configure the node address.

Switch Setting						Node Address	Switch Setting						Node Address
SW 1	SW 2	SW 3	SW 4	SW 5	SW 6		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	
0	0	0	0	0	0	0	1	0	1	1	0	0	13
1	0	0	0	0	0	1	0	1	1	1	0	0	14
0	1	0	0	0	0	2	1	1	1	1	0	0	15
1	1	0	0	0	0	3	0	0	0	0	1	0	16
0	0	1	0	0	0	4	1	0	0	0	1	0	17
1	0	1	0	0	0	5	0	1	0	0	1	0	18
0	1	1	0	0	0	6	1	1	0	0	1	0	19
1	1	1	0	0	0	7	0	0	1	0	1	0	20
0	0	0	1	0	0	8	1	0	1	0	1	0	21
1	0	0	1	0	0	9	0	1	1	0	1	0	22
0	1	0	1	0	0	10	1	1	1	0	1	0	23
1	1	0	1	0	0	11	0	0	0	1	1	0	24
0	0	1	1	0	0	12	1	0	0	1	1	0	25

Switch Setting						Node Address	Switch Setting						Node Address
SW 1	SW 2	SW 3	SW 4	SW 5	SW 6		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	
0	1	0	1	1	0	26	1	0	1	1	0	1	45
1	1	0	1	1	0	27	0	1	1	1	0	1	46
0	0	1	1	1	0	28	1	1	1	1	0	1	47
1	0	1	1	1	0	29	0	0	0	0	1	1	48
0	1	1	1	1	0	30	1	0	0	0	1	1	49
1	1	1	1	1	0	31	0	1	0	0	1	1	50
0	0	0	0	0	1	32	1	1	0	0	1	1	51
1	0	0	0	0	1	33	0	0	1	0	1	1	52
0	1	0	0	0	1	34	1	0	1	0	1	1	53
1	1	0	0	0	1	35	0	1	1	0	1	1	54
0	0	1	0	0	1	36	1	1	1	0	1	1	55
1	0	1	0	0	1	37	0	0	0	1	1	1	56
0	1	1	0	0	1	38	1	0	0	1	1	1	57
1	1	1	0	0	1	39	0	1	0	1	1	1	58
0	0	0	1	0	1	40	1	1	0	1	1	1	59
1	0	0	1	0	1	41	0	0	1	1	1	1	60
0	1	0	1	0	1	42	1	0	1	1	1	1	61
1	1	0	1	0	1	43	0	1	1	1	1	1	62
0	0	1	1	0	1	44	1	1	1	1	1	1	63

Figure 16-A

Note: Switch in UP position = 1 or open
Switch in DOWN position = 0 or closed

1791D – Compact I/O Block

The 1791D-Compact I/O Block is a example of a components that uses a combination of software setup and / or hardware setup

Open the door on upper left corner of the 1791D Compact I/O Block to view rotary switches



Figure 17-A

1791D Compact I/O Block –Rotary Switches

Note: 2 switches – MSD and LSD for Node Address setting
No Data Rate Switch - Data Rate is configured through software

View Data Rate setting

Open PLC220_Module5.dnt file in RSNetWorx software – Offline
Right click the 1791D- Compact I/O Block icon – Select Properties

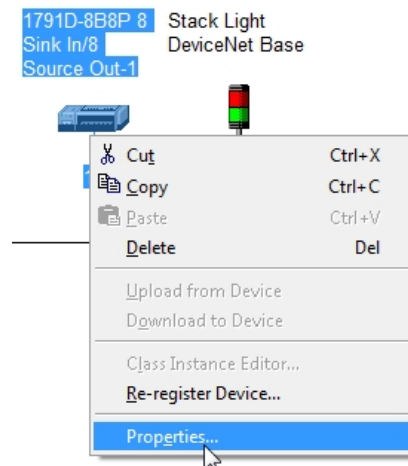


Figure 18-A
1791D- Compact I/O Block Properties

Click the Configuration tab on the 1791D-Compact I/O Block Properties window.

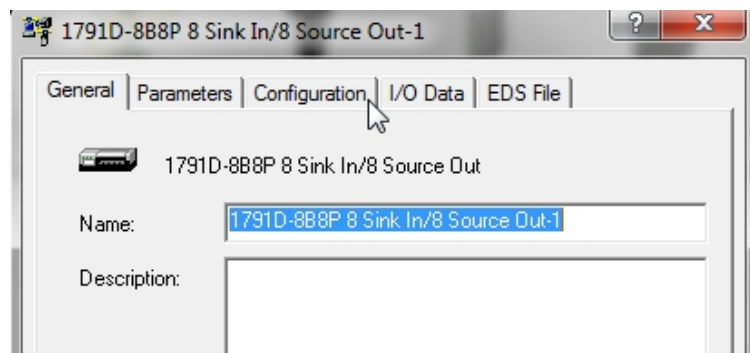


Figure 19-A
1791D- Compact I/O Block Properties Configuration Tab

Parameter 1 on the Configuration tab shows Autobaud setting.

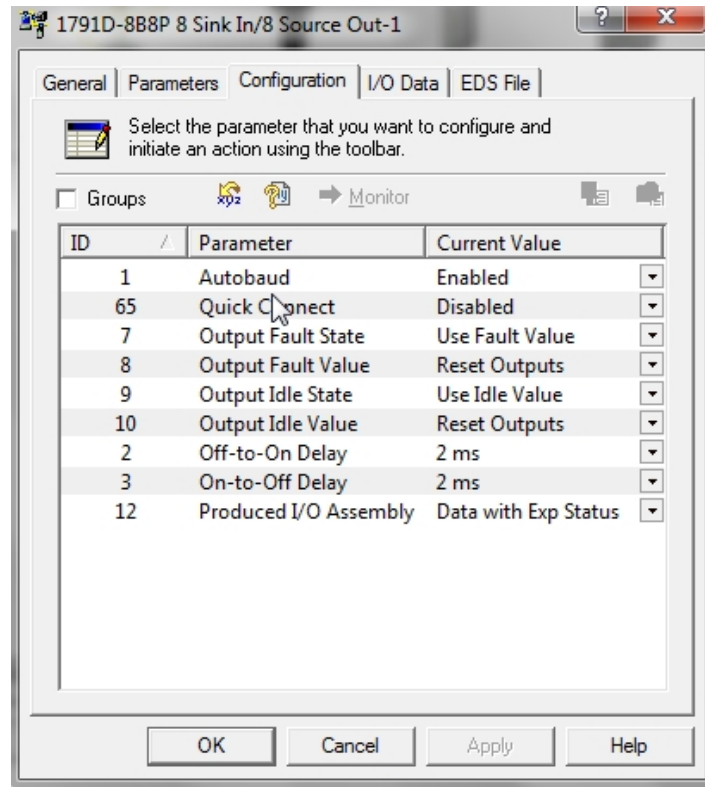


Figure 20-A
1791D- Compact I/O Block Configuration Tab –Autobaud Setting

Page 5 - 1791d-Installation.pdf has addition information on commissioning the 1791D-Compact I/O Block

RightSight Standard Diffuse Photoeye

Open PLC220_Module5.dnt file in RSNetWorx software – Offline
Right click the RightSight Standard Diffuse icon – Select Properties

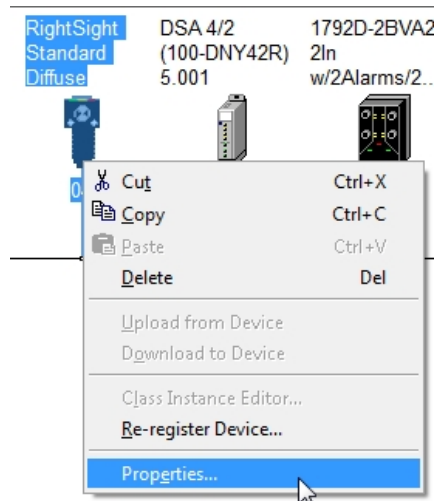


Figure 21-A
1791D- Compact I/O Block Properties

Click the Parameters tab on the RightSight Standard Diffuse Properties window.
Scroll down the Parameter list to view Parameters 23 and 24

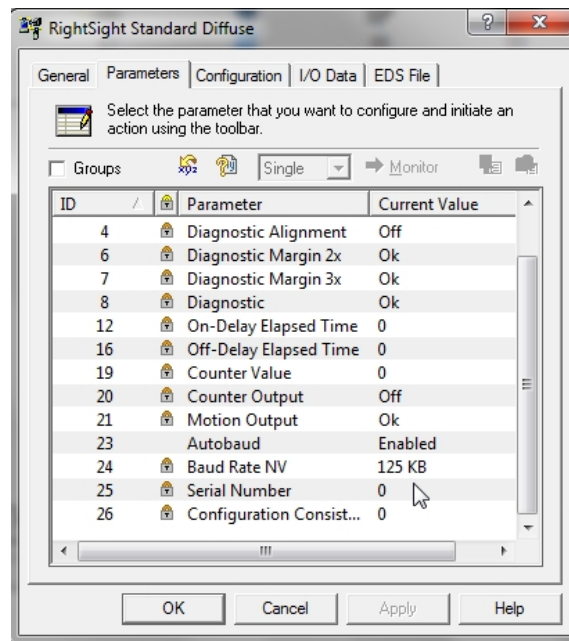



Figure 22-A
RightSight Standard Diffuse Parameters

Parameter 23 on the Parameters tab shows Autobaud setting – Enable by default

Parameter 24 on the Parameters tab shows the Baud Rate when Online

Parameter 24 is a Read only Parameter -  symbol

Note: No switches (Rotary or DIP) on the RightSight Photoeye
All setting are through RSNetWorx and Node Commissioning Tool

Note: 871TM Proximity Switch is similar – no switches

Review Questions

1. T F All DeviceNet components can be manually commissioned using switches or pushbuttons.
2. The default node address of the 22-COMM-D interface is:
 - a) 00
 - b) 01
 - c) 63
 - d) 64
3. Valid DeviceNet baud rates are:
 - a) 56.7K
 - b) 125K.
 - c) 250K
 - d) 230K.
4. T F With the network connected and powered, you can change the 1756-DNB Baud Rate using the configuration pushbutton.
5. To set the Baud Rate on a 22-COMM-D interface which switches are used:
 - a) 1 and 2
 - b) 2 and 4
 - c) 7 and 8
 - d) 5 and 6
 - e) None of the above

6. T F Switch settings are continuously read by all DeviceNet components
 .
7. T F Node address 63 is the default of new components
8. T F A Node Address setting of 99 is a valid configuration with an 855T Stack Light.
9. T F You can view the MAC ID and Baud Rate on the 1756-DNB display.
10. You need to set the node address of a 22-COMM-D interface to 25. how should switches 1-6 be configured:
 - a) 110001
 - b) 010101
 - c) 011001
 - d) 100110

Review Questions Answers

1) F

2) c

3) b, c

4) F

5) c

6) F

7) T

8) T

9) T

10) d