

PLC220 Lab Exercise 14

Devicenet 1756- DNB

Properties



1756-DNB Properties

Lesson Objective

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

1. Understand 1756-DNB Properties Information

Introduction	3
General Tab	5
Module Tab	6
Scanlist Tab	7
Input Tab	
Output Tab	
ADR Tab	
Summary Tab	
Review Questions	



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Introduction:

This Lab Exercise will view Properties information for the 1756-DNB Scanner Module.

Note: This Lab Exercise can be done Online or Offline.

If working Online: **Equipment Required:**

Computer with RSLogix 5000 / Studio 5000 software RSLinx software RSNetWorx for DeviceNet software Ethernet Port

ControlLogix Demo board with 1756-DNB module, 1756-processor 1756-Ethernet Communication Module Discrete Input / Output Modules

DeviceNet Demo Board with 871TM Prox switch RightSight Standand Diffuse Photoelectric Sensor 855T – Stack Light 1791D 8B8P Compact Block I/O PowerFlex 4 VFD

Note: Other components are also installed on DeviceNet Demo Board





Figure 1-A. The hardware configuration for this lab exercise.

Ensure all the DeviceNet component's cables are connected to the IDC taps on the bottom of the DeviceNet Demo Board

Twisted pair Ethernet cables from Computer Ethernet Port the 1756-EtherNet Module Note: the cable may be directly connected - no Switch required

DeviceNet drop cable to connect the DeviceNet Demo Board to the front port on the 1756-DNB Module located on the ControlLogix Demo Board.

Power-up ControlLogix and DeviceNet Demo Boards

Note: If the display on the 1756-DNB Module shows - No Network Power – the 1756-DNB Module is not receiving power from the DeviceNet network (drop cable) cable.

In the Lab exercise a connection will be made from the computer's Ethernet Port thru RSNetWorx for DeviceNet using a RSLinx, EtherNet/IP Driver to connect to the DeviceNet network

Ensure the Computer can connect to the ControlLogix Demo board using the 1756 – Ethernet Communication Module with an EtherNet/IP driver.

Note: DeviceNet Scanner Module - 1756-DNB - located in slot 6.

Open RSNetWorx for DeviceNet.



Start a new RSNetWorx for DeviceNet file

PLC220_Module	5.dnt - RSNetWor	x for DeviceN	let	
<u>File</u> <u>E</u> dit <u>V</u> iew <u>N</u>	<u>d</u> etwork <u>D</u> evice	D <u>i</u> agnostics	<u>T</u> ools	<u>H</u> elp
置 <u>N</u> ew		Ctrl+N	1	
🖬 🗃 <u>O</u> pehີ		Ctrl+O		
Save		Ctrl+S		1756 DI
Figure 2-A	. Creating a N	ew DeviceN	Vet file	.

Go Online to the DeviceNet Demo Board

Browse the DeviceNet network

Note: If working Offline – Start a new Network Layout – See Figure 2-A If working Offline select the DeviceNet Network file PLC220_Module5.dnt. Open the Network file

1756-DNB Properties:

Ensure 1756-DNB module icon is shown on the Network Layout window.



Figure 3-A Network Layout

1. Right click the 1756-DNB icon - Choose Properties from the context menu



1756-D	NB PowerFlex 4 1P 110V .25HP	871TM Shielded 18m with micro
X	Cu <u>t</u>	Ctrl+X
	🖹 <u>С</u> ору	Ctrl+C
6	<u>P</u> aste	Ctrl+V
	<u>D</u> elete	Del 🚽
	<u>U</u> pload from Device D <u>o</u> wnload to Device	
	Class Instance Editor	
	<u>R</u> e-register Device	
	Export I/O Details	
	Propert <u>i</u> es	

Figure 4-A 1756-DNB Scanner Properties

2. General Tab – Shows component information

Name:

Address: Default Address - 63 Catalog: device part number Revision; device revision level Type: Device Function

See Figure 5-A



🕞 1756-DNB	? <mark>* * *</mark>
General Module	e Scanlist Input Output ADR Summary
175	56-DNB
Name:	1756-DNB
Description:	
Address:	
Vendor	Bockwell Automation/Allen-Bradley [1]
Туре:	Communications Adapter [12]
Device:	1756-DNB [14]
Catalog:	1756-DNB
Revision:	6.002
	OK Cancel Apply Help

Figure 5-A !756-DNB Scanner Module – General Tab

Note: Components with software settable Node Addresses (MAC ID), the Address selection (Spin) box can be used to change the components address (MAC ID).

Modifying the Address setting will use the Node Commission Tool to make the change.

RSNetWorx for DeviceNet will automatically run the Node Commission Tool. No user interaction with the Node Commission Tool is required.

If changes are made - click the Apply button to save settings

3. Click the Module Tab – Shows 1756-DNB communication timing settings

The Module Properties tab also shows a Slot setting

The slot number is used as part of the memory map element display on the Input and Output Properties tabs.



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See Figure 6-A

- Note: This setting is cosmetic only, in that is does not need to show the actual slot number of the 1756-DNB module in the actual ControlLogix chassis.
 - Example: Previous lab exercises worked even through the Module tab Slot setting was configured for 1.

ControlLogix Demo Board slot location for 1756-DNB - Slot 6

756-DNB					2	x
General Module Scanlist	Input	Outpu	ut	ADR Sur	mmary	
Interscan Delay: Foreground to	10	⊥ mse	ic j	Upload fro	om Scanner I to Scanner	
Background Poll Ratio:	J	-	-	Module	Defaults	11
				Slave	Mode	
			[Adva	nced	ן ב
- 1756-DNB:						
Slot: 1						
ОК	C	ancel		Apply	Hel	p
	Fig	gure 6-	A		_	

1756-DNB – Module Tab

4. Click the Scanlist Tab - Shows Network DeviceNet information

Available Devices: DeviceNet components that the 1756-DNB Scanner module finds on the DeviceNet Network. No communication configured between 1756- DNB Scanner and the component



Scanlist: DeviceNet components that the 1756-DNB Scanner module finds on the DeviceNet Network. Communication configured between 1756- DNB Scanner and the component

See Figure 7-A

📲 1756-DNB	8 22
General Module Scanlist Input O Available Devices: 02, PowerFlex 4 1P 110V > > 0 06, DSA 4/2 (100-DNY42 > > > 0 09, 1792D-2BVA2D 2ln w <	utput ADR Summary Scanlist: 03, 871TM Shielded 18m 04, RightSight Standard 11, Stack Light DeviceNe
>> <	
Automap on Add Upload from Scanner Download to Scanner Edit I/O Parameters	✓ Node Active Electronic Key: ✓ ✓ Device Type ✓ Vendor ✓ Product Code Major Revision ✓ ✓ Minor ✓ or higher
OK Cance	Apply Help

Figure 7-A 1756-DNB –Scanlist Tab

Automap on Add check box: Checked

Automatically configures component's Input and /or Output Data location(s) in the 1756-DNB modules Input and /or Output memory when the component is added to the 1756-DNB Module's Scanlist

Unchecked Input and /or Output must be user configured

Node Active check box: Check

Selected component in Scanlist and the 1756-DNB module will exchange data



Unchecked Even though the component is listed in the 1756-DNB Scanner Scanlist, Scanner module and selected component will not exchange data Similar to Inhibit Module setting for a 1756 I/O Modules Electronic Keying: Component information must match for the component to function on a DeviceNet Network

Similar to Electronic Keying setting for a 1756 I/O Modules

Edit I/O Parameters button – Determine the method of communication (Message Type) between a DeviceNet component and the 1756-DNB Scanner

To view the Message Type information, select a component in either the Available Devices or Scanlist box



Figure 8-A RightSight Standard Diffuse Selected - Scanlist box

Click the Edit I/O Parameters button



Figure 9-A



Edit I/O Parameters button - Scanlist Tab 1756-DNB Scanner

The Edit I/O Parameters for the selected component opens

See Figure 10-A

Check Boxes show Messaging Type between the selected component and the 1756-DNB Scanner

Change of State (COS) selected in Figure 10-A window

Edit I/O Parameters : 04, RightSight Standard Diffuse						
Input Size:	Change of State / Cyclic					
Use Output Bit:	Input Size: 1 📑 Bytes					
Polled:	Output Size: 0 📑 Bytes					
Input Size: 0 📩 Bytes	Heartbeat Rate: 250 📩 msec					
Output Size: 0 🚊 Bytes	Advanced					
Poll Rate: Every Scan 💌						
OK Cancel Restore I/O Sizes						

Figure 10-A Edit I/O Parameters Window

Click OK button to save any changes to component I/O Parameters

5. Click the Input Tab – Shows Input Mapping of Scanlist devices



📲 1756-DNB	? ×
General Module Scanlist Input Output ADR Su	mmary
Node ∠ Type Size Map ⊞: 😤 03. 871 COS 1 1:1.Data[0].8	AutoMap
	Unmap
↓ G	Advanced
< >	Options
Memory: Assembly Data Start DWord: 0	
Bits 31 - 0 1:1.Data[0] 1:1.Data[1] 1:1.Data[1] 1:1.Data[2] 1:1.Data[3] 1:1.Data[5] 1:1.Data[6] 1:1.Data[7] 1:1.Data[8]	04, Right
OK Cancel Apply	Help

Figure 11-A 1756-DNB Input Mapping

Use the Scroll Bar on the side of the Data Elements region to determine total number of Input Elements for the 1756-DNB Scanner Module.

Total Number of Input Data Elements:

View mapping buttons to the right of the Scanlist Input components

Node	Δ.	Туре	Size	Мар		AutoMan
⊕• <mark></mark> <mark>2</mark> 0)3, <mark>871</mark>	COS	1	1:I.Data[0].8		- Harsen ap
🖶 🖣 🚺)4, Rig	COS		1:1.Data[0].0		Union
🗄 🖣 1	11, <mark>Sta</mark>	Polled	1	1:I.Data[0].16		Unmap
						Advanced
•					•	Options
			Fig	ure 12-A		

1756-DNB Input Mapping Buttons

AutoMap: Automap selected component (if not already Automapped) If component is Automapped - AutoMap button is greyed-out



Unmap: Delete mapping information of selected component.

Advanced...: Manually map an unmapped component

Options..: Shows Automap data boundaries – See Automap Options window



Figure 13-A Data Boundaries used for Automapping

Note; Default Data Alignment - Byte Align Data mapped based on Byte locations in the Input Mapping Table.

6. Click the Output Tab – Shows Output Mapping of Scanlist devices



1756-DNB	8 X
General Module Scanlist Input Output ADR Su	ummary
Node △ Type Size Map ⊞… ¶ 11, Sta Polled 1 1:0.Data[0].0	AutoMap
	Unmap
	Advanced
4	Options
Memory: Assembly Data 💌 Start DWord: 0	3
Bits 31 - 0	
1:0.Data[0]	11, Stack
1:0.Data[1]	
1:0.Data[2]	
1:0.Data[3]	
1:0.Data[4]	
1:0 Data[6]	
1:0 Data[7]	
1:0.Data[8]	T
OK Cancel Apply	Help

Figure 14-A 1756-DNB Output Mapping

Use the Scroll Bar on the side of the Data Elements region to determine total number of Output Elements for the 1756-DNB Scanner Module.

Total Number of Output Data Elements:

Information similar to Input tab data.

7. Click the ADR Tab – Shows Automatic Device Recovery (ADR) settings for the 1756-DNB Scanner Module

See Figure 15-A

Automatic Device Recovery (ADR) allows a replacement component to receive the configured Parameter settings of a failed DeviceNet component.

Note: For ADR to succeed the newly installed component must have a software



configurable Node Address (MAC ID) .

Before installation, the device to be installed must have a Node Address (MAC ID) of 63. Default Address of new DeviceNet components.

This is the reason it is recommended that Node 63 be left unoccupied on a DeviceNet Network.

ADR saves component Parameter settings to 1756-DNB Scanner memory

📲 1756-DNB	? ×
General Module Scanlist Input Output	t ADR Summary
□ Enable Auto-Address Recovery ▲vailable Devices: Node ADR # Bytes 03, 87 - □ 04, Ri - □ 11, St -	Upload from Scanner Download to Scanner ADR Space (in Bytes): Total: 65535 Used: 0 est ADR Settings: Configuration Recovery Auto-Address Recovery Load Device Config
OK Cancel	Apply Help

Figure 15-A ADR Tab – 1756-DNB Scanner

To configure ADR – check the Enable Auto-Address Recovery Check Box

Enable Auto-Address Recovery

Figure 16-A Enable Auto-Address Recovery Check Box

Click Yes button on Enable Auto-Address Recovery window to confirm



See Figure 17-A.

wARNING:					
Using this feature in more than one scanner on the same network is not recommended.					
enabling Auto-Address Recovery before continuing. More Info					
Are you sure you want to enable Auto-Address Recovery?					
Yes No					

Figure 17-A Enable Auto-Address Recovery

Highlight the Device for ADR Configuration in Available Devices box.

Available Devices	s:	
Node	ADR	# Bytes
203, 871T	-	-
📲 04, RightS	-	-
🖣 11, Stack	2	-
l .		

Figure 18-A Device Selected for ADR – Available Devices

Click the Load Device Config button near the bottom right corner of the 1756-DNB window.

Load Device Config	24
Figure 19-A	

Load Device Config Button

Highlight - Device for ADR Configuration in Available Devices box.



Bytes value shows how much memory is required to save selected device's Parameter settings in the 1756-DNB Module.

Available De	vices:				Downl	oad to Scanner
Node	ADR	# Bytes				
203, 87	-	-		- AD	R Space	(in Bytes):
⁸ 04, Ri	-	176			Total:	65535
🖣 11, St	-	-				
					Used:	0
						,
			L			

Figure 20-A ADR Configuration Window

The ADR Space (in Bytes) region of the 1756-DNB window shows total available memory in the 1756-DNB Scanner for ADR– Total box

The ADR Space (in Bytes) region of the 1756-DNB window shows memory presently allocated for ADR in the 1756-DNB Scanner – Used box

📲 1756-DNB	?
General Module Scanlist Input Out	put ADR Summary
✓ Enable Auto-Address Recovery	Upload from Scanner
Available Devices:	Download to Scanner
Node ADR # Bytes	ADR Space (in Bytes):
03, 87 04, Bi 176	T
11, St 240	lotal: 60030
	Used: 0 est
	ADR Settings:
	Recovery
	Auto-Address Recovery
	Load Device Config
	2
OK Cancel	Apply Help

Figure 21-A ADR Configuration Window



In the ADR Settings region of the 1756-DNB – check Configuration Recovery and Auto-Address Recovery Check Boxes.

See Figure 22-A

Download to Scanner
ADR Space (in Bytes):
Total: 65535
Used: 176 est
ADR Settings:
Configuration Recovery
Auto-Address Recovery
Load Device Config
Figure 22-A

Configuration Recovery and Auto-Address Recovery Check Boxes.

The ADR Space (in Bytes) region of the 1756-DNB window updates presently allocated memory for ADR in the 1756-DNB Scanner – Used box

Click Apply button to save ADR settings



Apply Button – Save ADR Setting

Note: Depending on the type and number of components on a DeviceNet Network and the Total memory limit in the 1756-DNB Scanner, ADR configurations for all devices may not be possible.

VFD devices will use more ADR memory than a RightSight Standard Diffuse Photoelectric Sensor – VFDs have more Parameters

Different Revisions of the 1756-DNB Scanner have different amounts of available



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ADR memory

8. Click the Summary Tab - Shows Summary information for Scanlist devices

🖞 00, <	CI.				Mapped	Output	Mappeo
	.5	No		0	No	0	No
203, 8	371	Yes	DVP	1	Yes	0	No
🖁 04, F	Rig	Yes	DVP	1	Yes	0	No
1 1.9	da	Yes	DVP	1	Yes	1	Yes

Figure 24-A 1756-DNB Scanner – Summary Window

The Summary window has no configurable settings.

Review Questions

- 1. T F An available DeviceNet component must be mapped
- 2. The default node address a DeviceNet component is:
 - a) 00
 - b) 01



- c) 63
- d) 64
- 3. Which are valid Message Types for a DeviceNet Component :
 - a) Polled
 - b) Cyclic
 - c) Change of State
 - d) Strobed
- 4. T F All DeviceNet components must have ADR enabled
- 5. Default device mapping is based on which type of data :
 - a) Bit
 - b) Word
 - c) DINT
 - d) INT
 - e) Byte
- 6. T F Total number of Input Elements for device mapping in a 1756-DNB module is 124:
- 7. T F Replacement devices used for ADR require a Node Address of 0.
- 8. T F Device Parametes used for ADR are stored in the ControLlogix processor



- 9. T F Scanlist devices must be Automapped
- 10. Total number of Output Elements for device mapping in a 1756-DNB module is:
 - a) 64
 - b) 123
 - c) 124
 - d) 32

Review Questions Answers

F
 c
 a, b, c,d
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