

NETWORK SYSTEM

Devicenet Network

Devicenet Introduction

Configure Devicenet Network

Control devices via Devicenet

Back up on DeviceNet

PowerFlex 700S inverter

Control PowerFlex 700S via devicenet

Ethernet Network

Ethernet Introduction

Configure Ethernet Network

Control devices via Ethernet

ControlNet Network

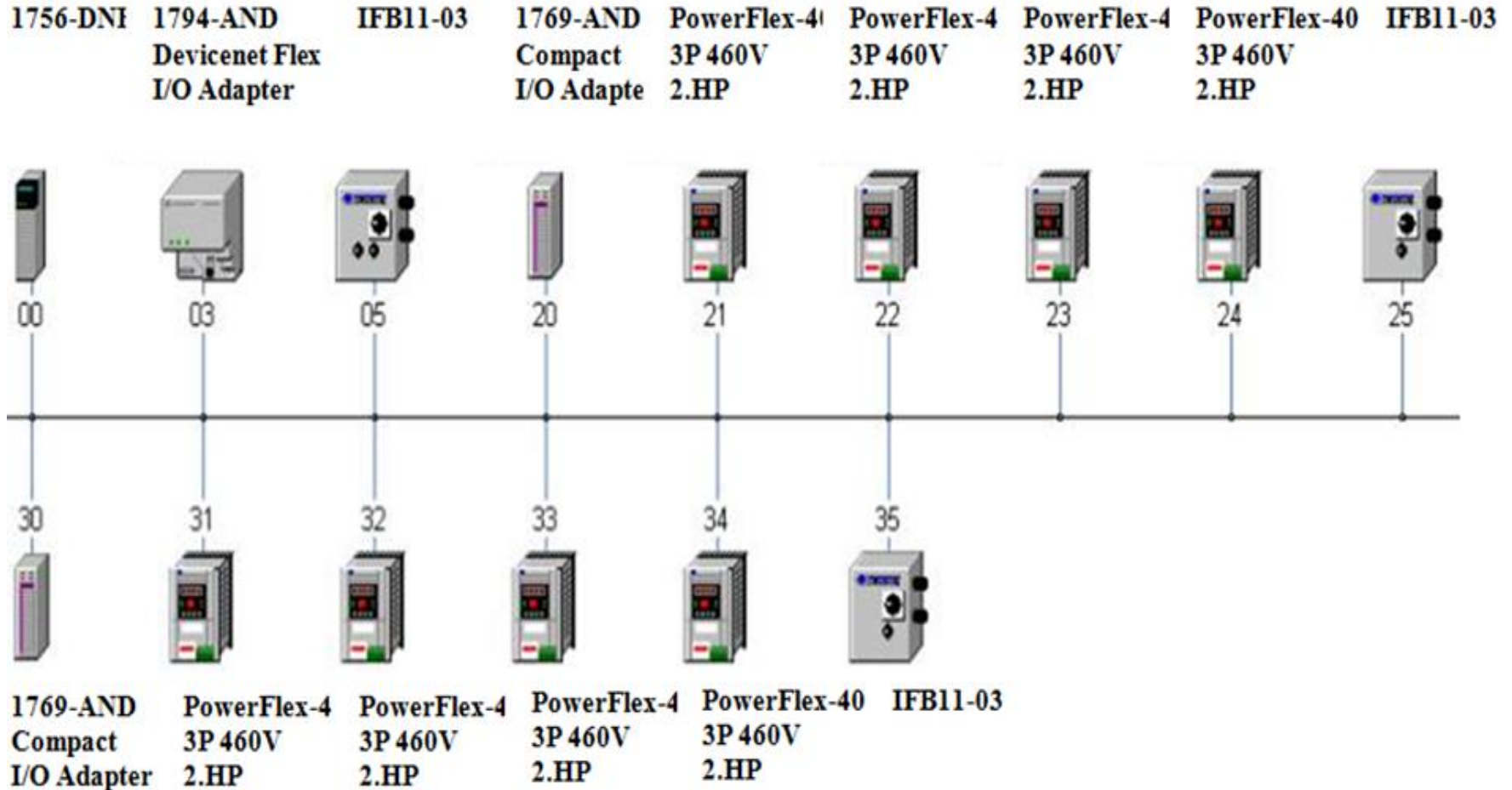
ControlNet Overview

Configure ControlNet Network

Control devices via ControlNet

DEVICENET NETWORK

DeviceNet Overview

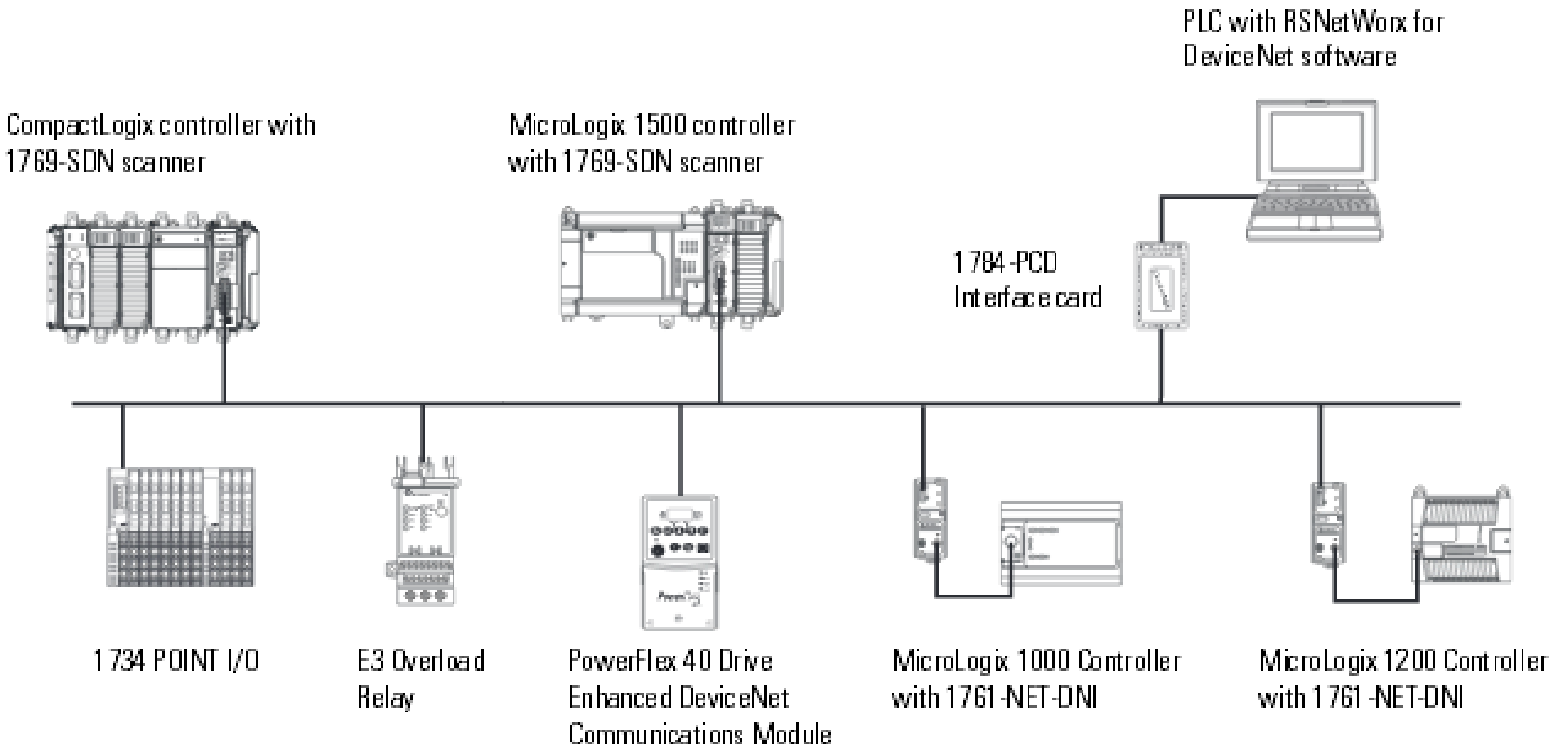


Up to 64 nodes(0-63) in DeviceNet Network

There are one Master and Slaves

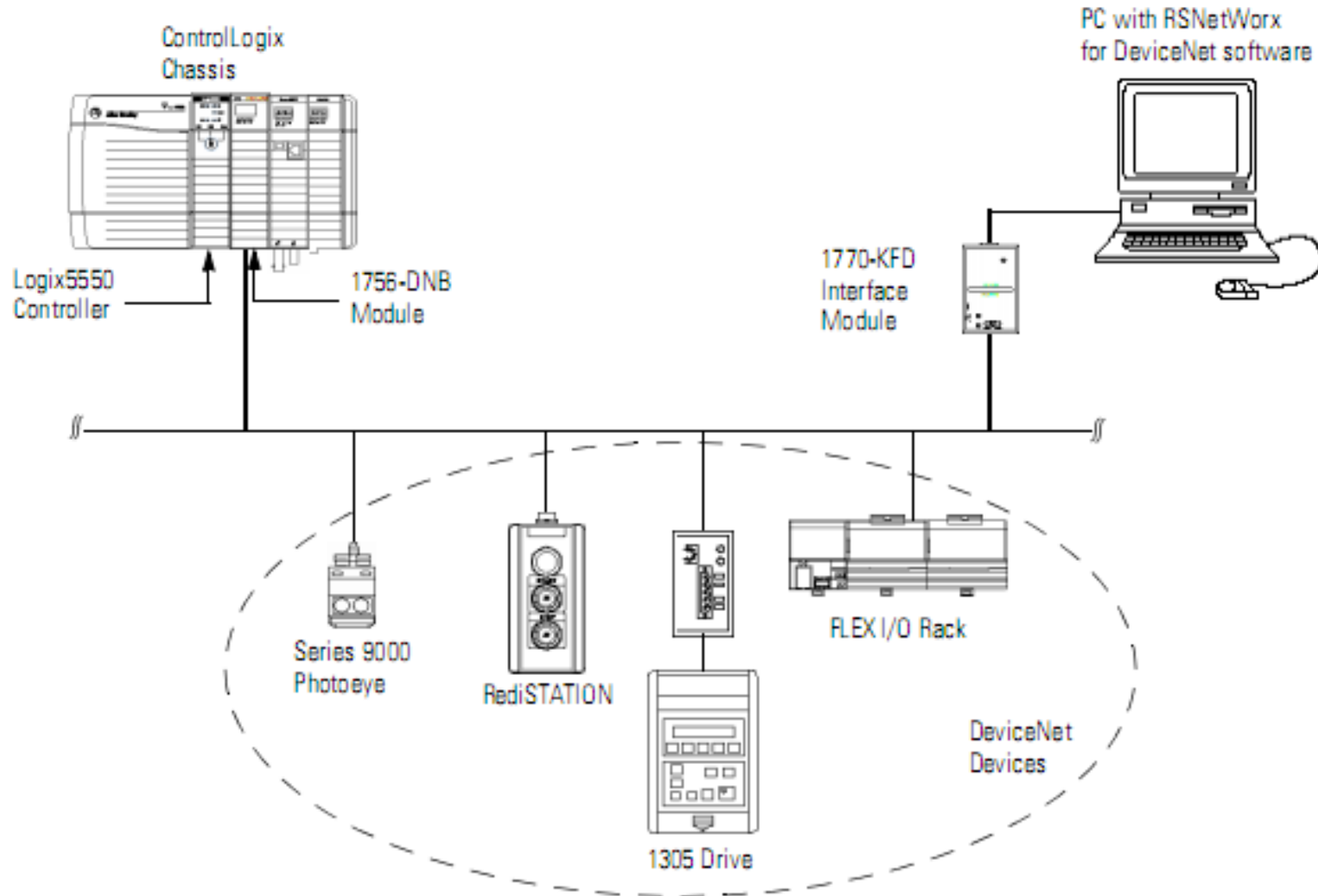
DEVICENET NETWORK

Communication between DeviceNet Devices and CompactLogix via 1769 SDN Module



DEVICENET NETWORK

Communication between DeviceNet Devices and CompactLogix via 1756 DNB Module



DEVICENET NETWORK

DeviceNet Features and Functionality

Network size	Up to 64 nodes
Network Length	125Kbps: 500m 250Kbps: 250m 500Kbps: 100m
Data Packets	0-8 byte
Bus Topology	Linear (trunkline/dropline); power and signal on the same network cable
Bus Addressing	Peer to Peer, MultiMaster hoặc Master/Slave
System Features	Removal and replacement of devices from the network under power

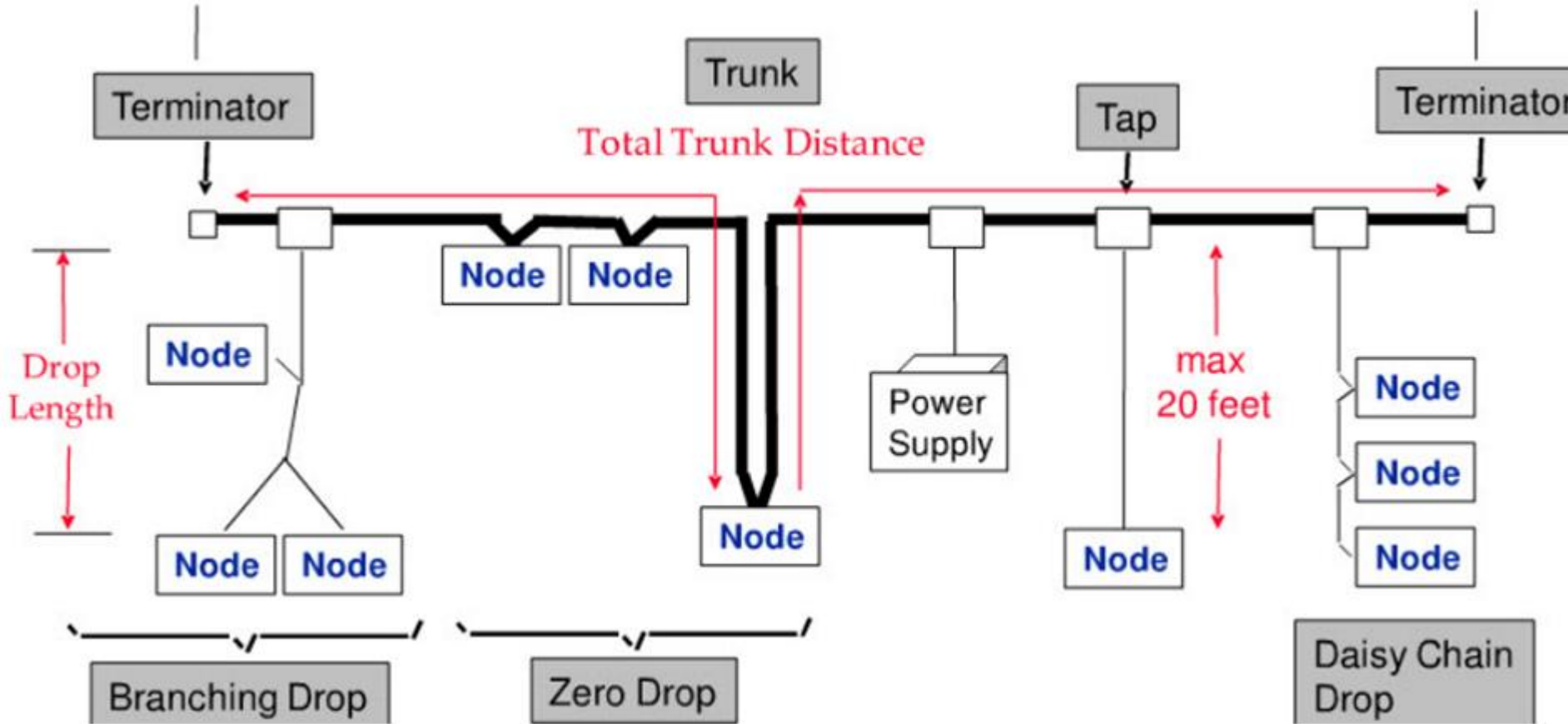
DEVICENET NETWORK

Assign an address to each Devices

Give this device	This address	Notes
Scanner	0	If you have multiple scanners, give them the lowest addresses in sequence (0, 1...).
Any device on the network except the scanner	1...61	<ul style="list-style-type: none">• Give the lower addresses to devices with 15 bytes or more of input or output data.• Gaps between addresses are OK and have no effect on system performance. If you are uncertain of the final lay-out of your system, leave gaps between addresses. This gives you some flexibility as you develop your system.
Computer interface to the network	62	If you connect a computer directly to the DeviceNet network, use address 62 for the computer. <ul style="list-style-type: none">• Many computer interface devices use this address as their default.• The 1784-U2DN device can connect a computer directly to a DeviceNet network.
No device	63	Always leave address 63 open. Out of the box, most DeviceNet devices are preset for address 63. <ul style="list-style-type: none">• Some devices have no switches or push button to set the address. They require software, such as RSNetWorx for DeviceNet software to change the address. This means that you must first place it on the network at its preset address of 63 before you can change the address.• If another device is already using address 63, there will be an address conflict and you won't be able to communicate with the newly connected device.• Leaving address 63 open makes it possible to configure a new device.• The auto-address recovery feature also requires address 63 to be open.

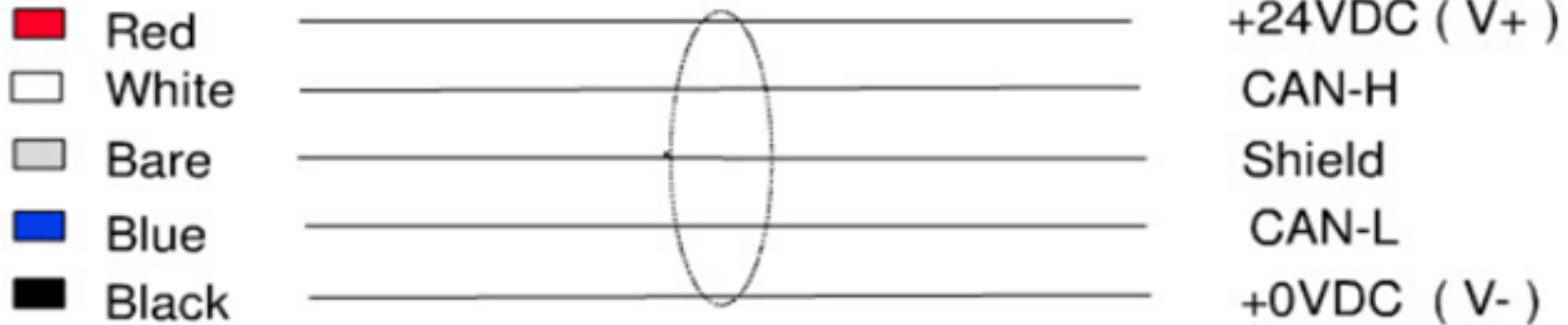
DEVICENET NETWORK

Bus Topology



DEVICENET NETWORK

DeviceNet Cable

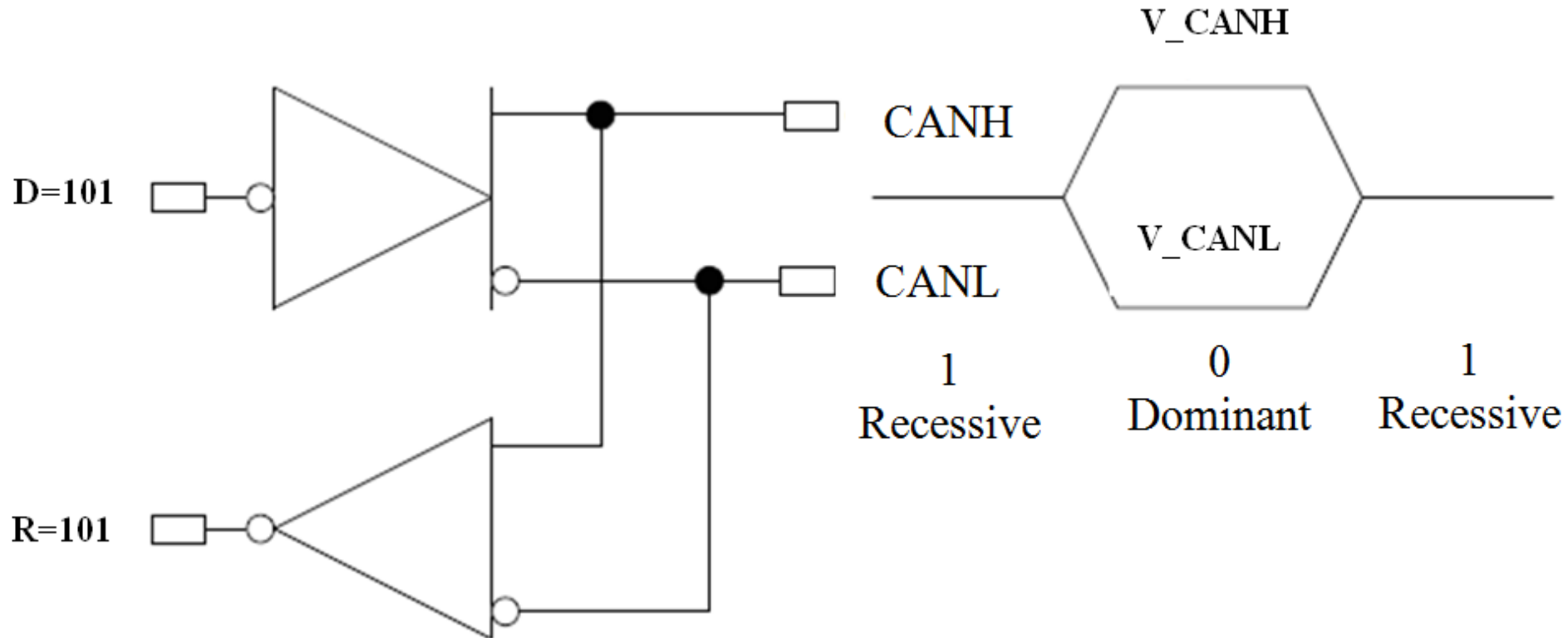


DeviceNet Cable specifications

- 5 conductors, 1 pair of 24volts DC Power, 1 pair for can communication, one shield.
- Maximum current for 24 volts power DC is 3 amps.

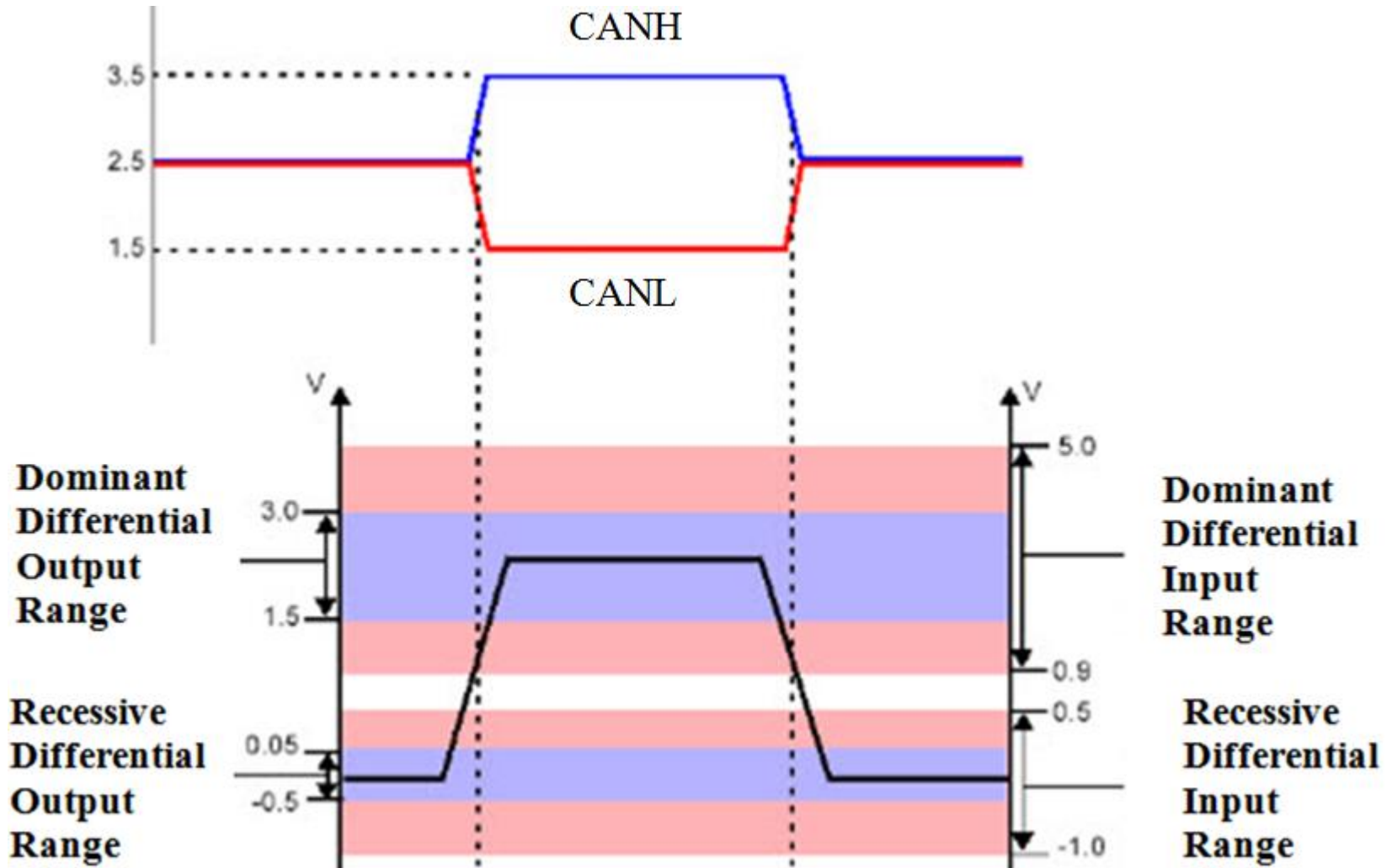
DEVICENET NETWORK

The Inverted Logic of DeviceNet Bus



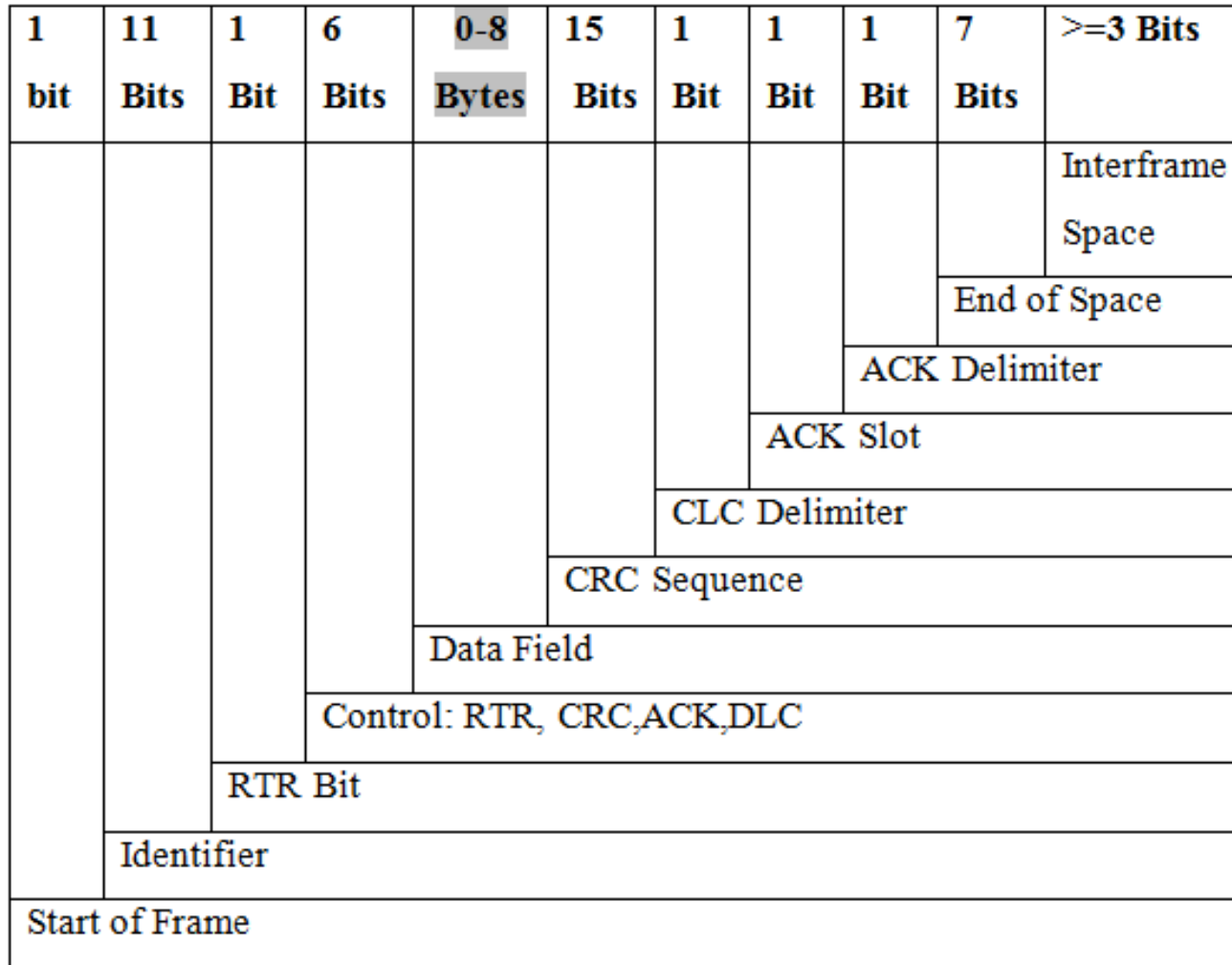
DEVICENET NETWORK

The Inverted Logic of a DeviceNet Bus



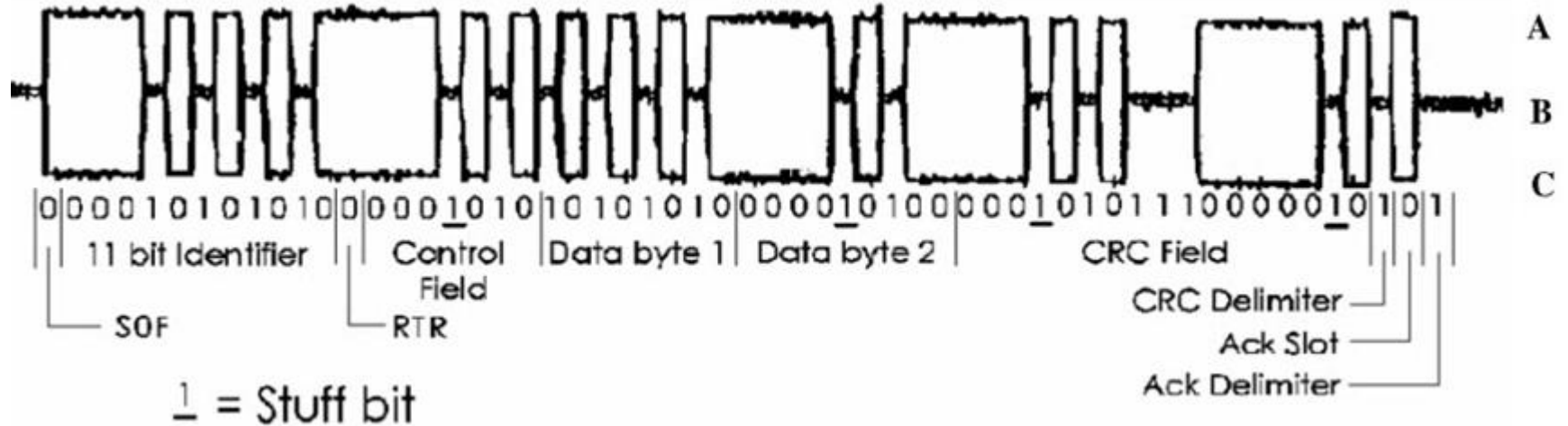
DEVICENET NETWORK

DeviceNet Data Frame



DEVICENET NETWORK

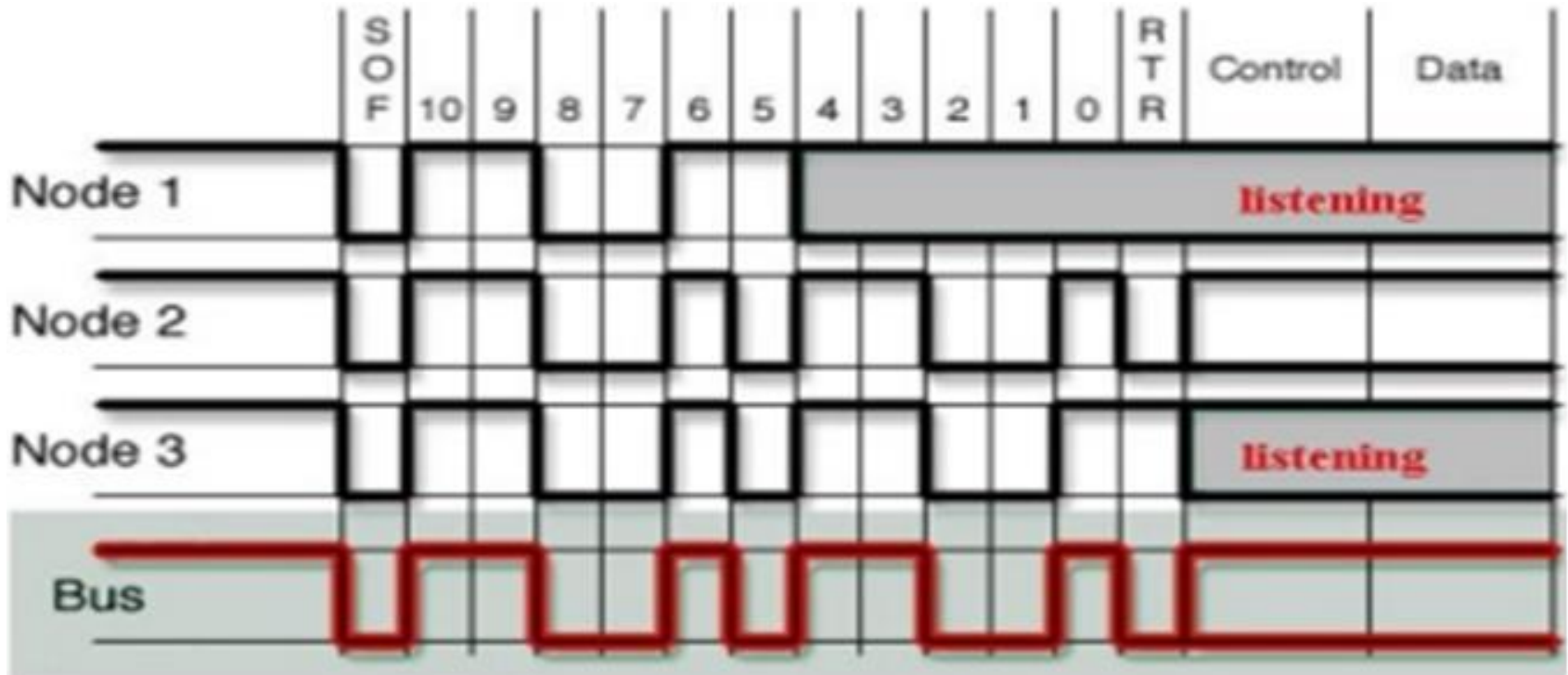
Logic State of Data Frame



Identifier field and RTR bit are used to identify which node has right to access bus

DEVICENET NETWORK

Arbitration of DeviceNet Bus



If a node transmitting a recessive bit receives a dominant bit while sending **the arbitration field**, it stops transmitting

The winner of all nodes transmitting simultaneously is the one with the **lowest-numbered 11-bit identifier**

DEVICENET NETWORK MESSAGES

DeviceNet supports two types of messaging: **Explicit Messaging** and **I/O Messaging**

Explicit Messages: Used between two devices for configuration and diagnostic data transfer. They are low priority and not time-critical.

I/O Messages is time-critical and have high priority

Basic Format of Explicit Messages

Destination	Service	Class	Instance	Attribute	Data
node address	code	ID	ID	ID	

Destination Node Address: The node address of the Unit that is sending the explicit messages (commands)

Service Code, Class ID, Instance ID, Attribute ID: The parameters used for specifying the command, processing object, and processing content.

EXPLICIT MESSAGES

Service Code, Class ID, Instance ID, Attribute ID of Devices

Service Code	Class ID	Instance ID	Attribute ID	Description
0E Hex	01	01	01	Get Vendor ID
0E Hex	01	01	02	Get Device Type
0E Hex	01	01	03	Get Product Code
0E Hex	01	01	04	Get Revision
0E Hex	01	01	05	Get Status
0E Hex	01	01	06	Get Serial Number
0E Hex	01	01	07	Get Product Name
0E Hex	03	01	01	Get MAC ID
0E Hex	03	01	02	Get Baudrate
10 Hex				Set MAC ID
10 Hex				Set Baudrate
10 Hex	90	01	12	Set Heartbeat to a device
0E Hex	90	01	12	Read Heartbeat from a device
05 Hex				Reset Device

If we know Service, Class, Instance and Attribute of Devices, we can access any data of devices.

EXPLICIT MESSAGES

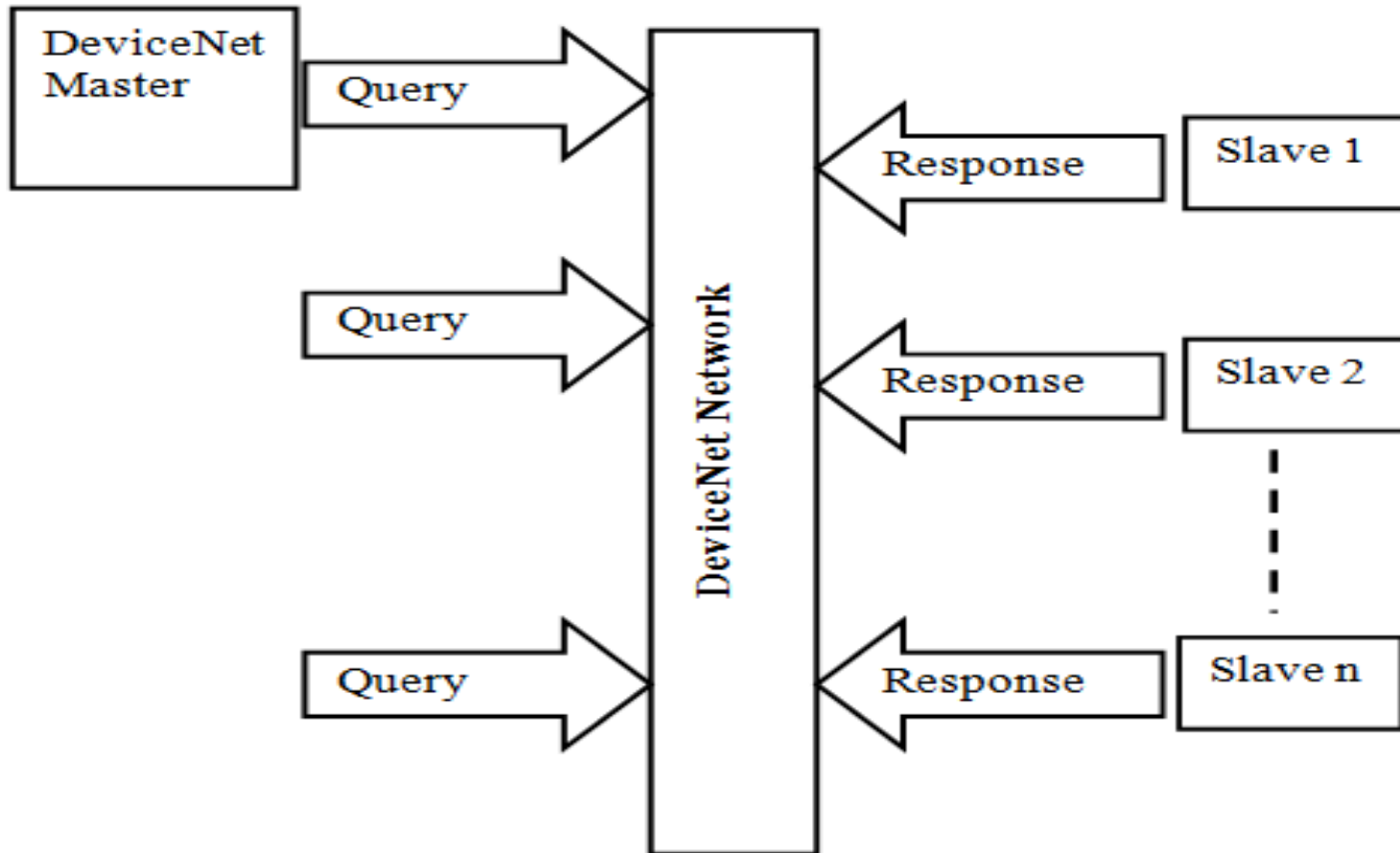
Setting heartbeat for Device using Service Code, Class Code, Instance Code and Attribute Code



The screenshot shows the 'Message Configuration - Set_Heartbeat' dialog box. It has three tabs: 'Configuration', 'Communication', and 'Tag'. The 'Configuration' tab is active. The 'Message Type' is set to 'CIP Generic'. The 'Service Type' is 'Set Attribute Single'. The 'Source Element' is 'Configure_Heartbeat'. The 'Source Length' is 2 (Bytes). The 'Service Code' is 10 (Hex), 'Class' is 90 (Hex), 'Instance' is 1, and 'Attribute' is 12 (Hex). The 'Destination' is empty. There is a 'New Tag...' button at the bottom right.

I/O MESSAGES

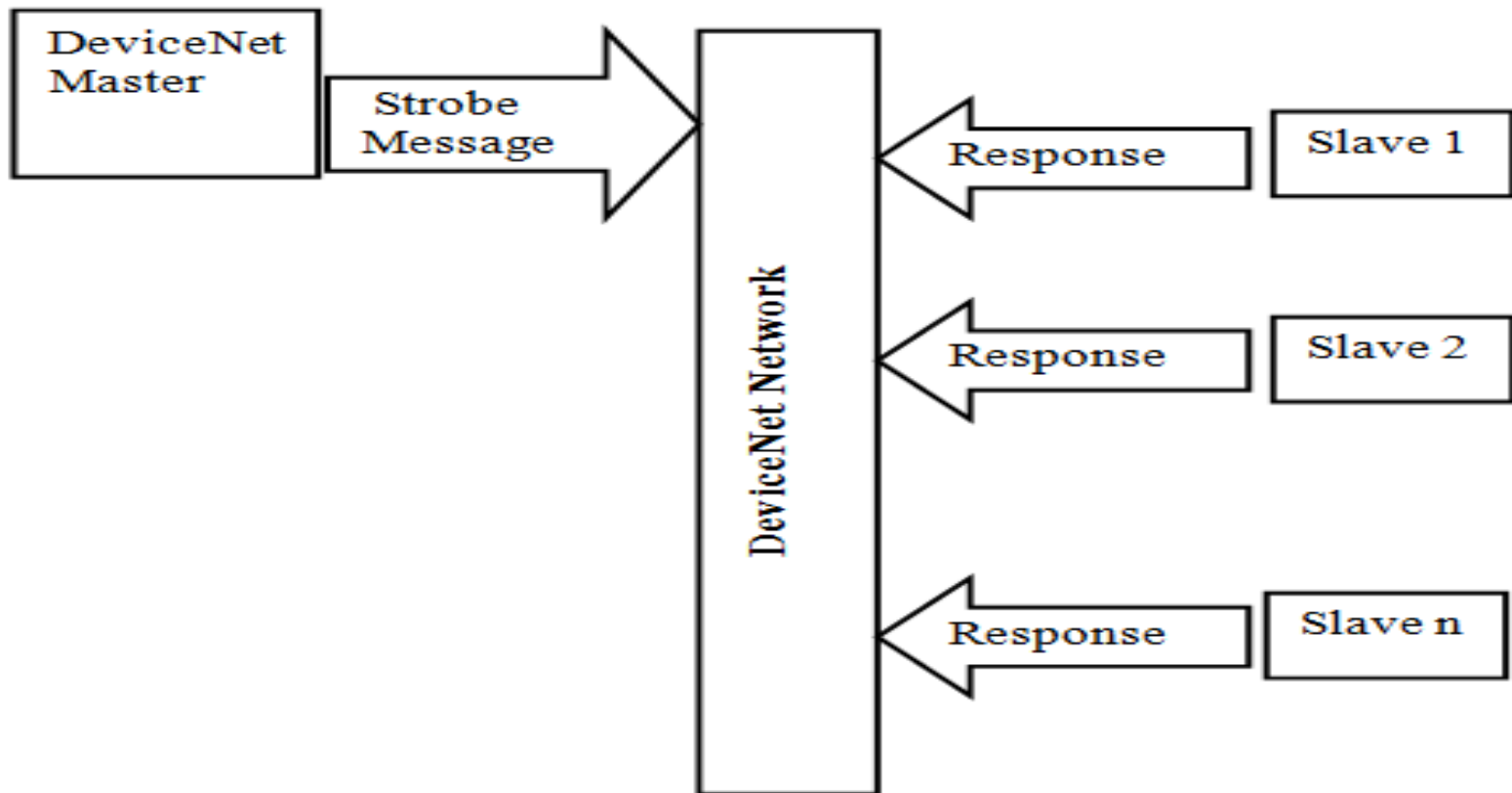
Polled I/O Messages: Master Scanner automatically sends a message containing outputs to each slave with a connection configured for polling. The slave sends back a response containing input data. Polling therefore requires 2 messages to update the I/O data for each polled device



Polling is the most accurate but least efficient method of updating I/O data

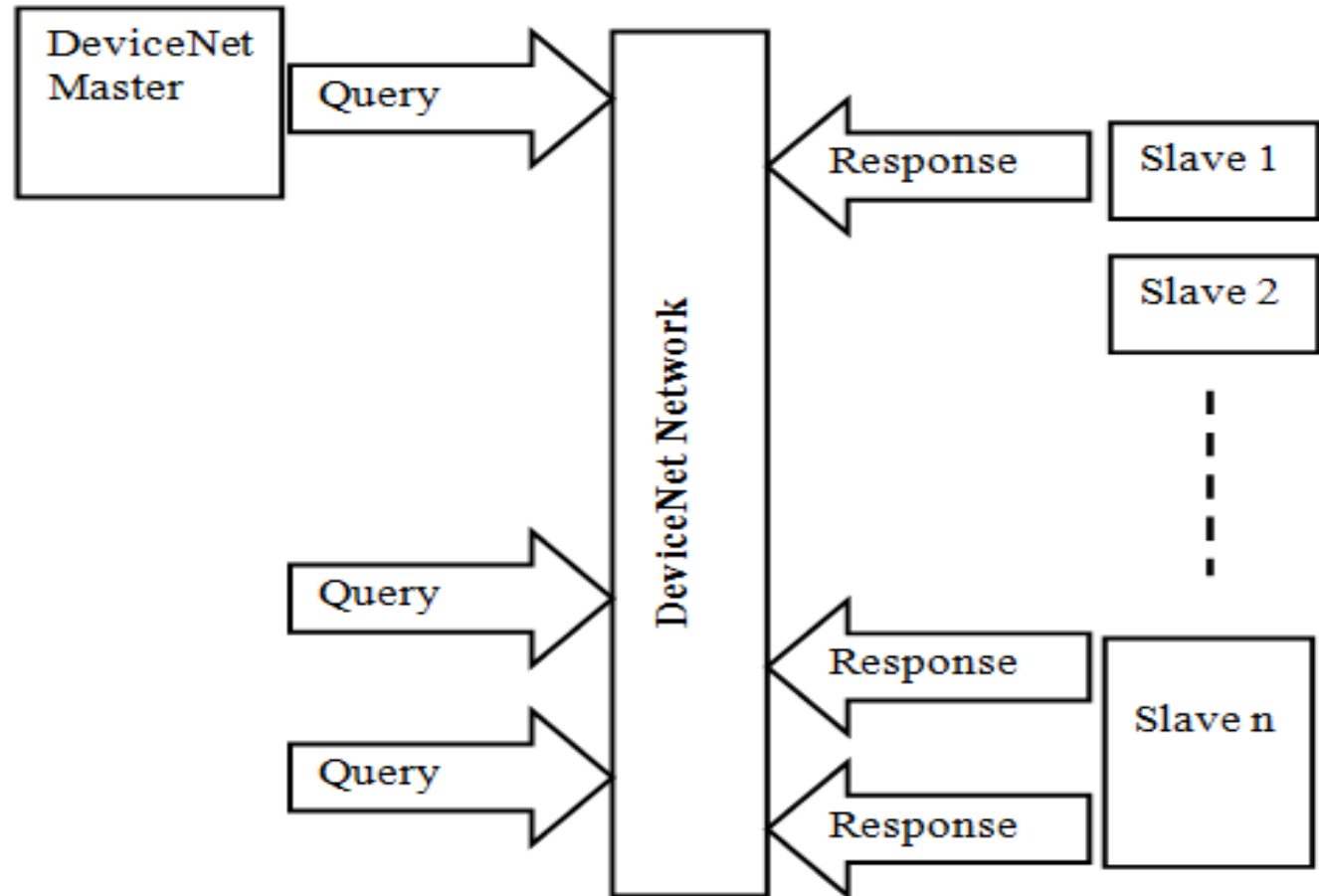
I/O MESSAGE

Strobed I/O Messages: The master produces a single Strobe request message that is consumed by all devices with a connection configured for strobing, requesting their current status. This occurs at the rate selected using the Scan Interval parameter of the DeviceNet Master Module



I/O MESSAGES

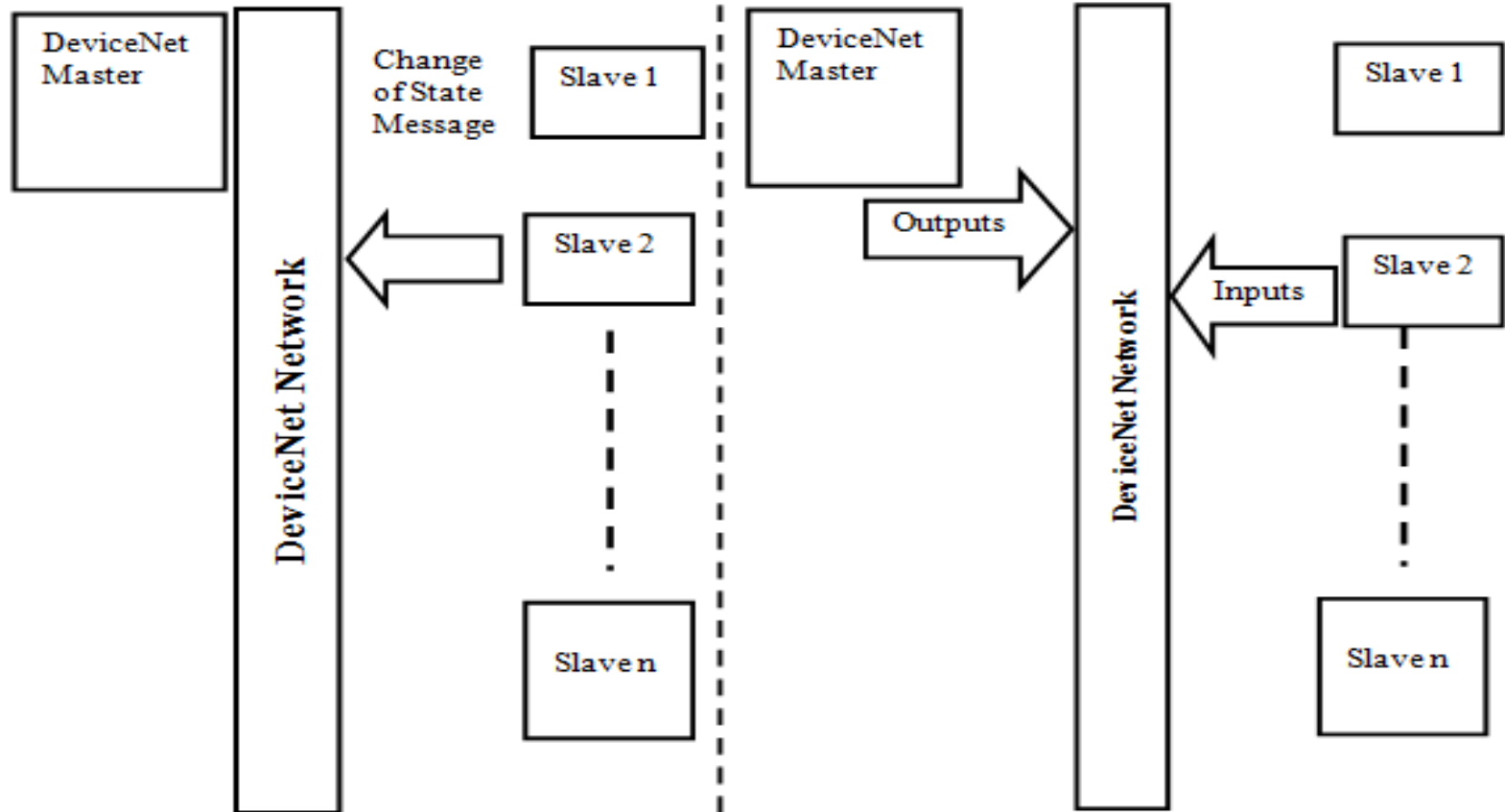
Cyclic I/O Messages: The Master Scanner automatically sends a message containing outputs to a device with a connection configured for Cyclic update. The device sends back a response containing input data



Unlike Polled messaging, Cyclic messaging can use a different interval as configured for each slave

I/O MESSAGE

COS I/O Messages: A connection configured for **Change-of-State** (COS) I/O Messaging is activated only when the device sends a message to the master, reporting a change of status. The master then sends an output message to the device and the device responds with its input data



Devices Produce Change of State Message

Master sends Outputs, Devices Replies

I/O MESSAGE

Selecting I/O message to transfer between Master and Slave

The diagram illustrates the selection of an I/O message for transfer between a Master and a Slave. On the left, three modules are shown connected to a common bus:

- 1769-SDN Scanner Module** (Module ID: 00)
- PowerFlex 700S 2 208V 4.8A** (Module ID: 03)
- 1794-ADN DeviceNet Flex I/O Adapter** (Module ID: 15)

The right side shows the **1769-SDN Scanner Module** configuration window. The **Scanlist** tab is active, showing the following configuration:

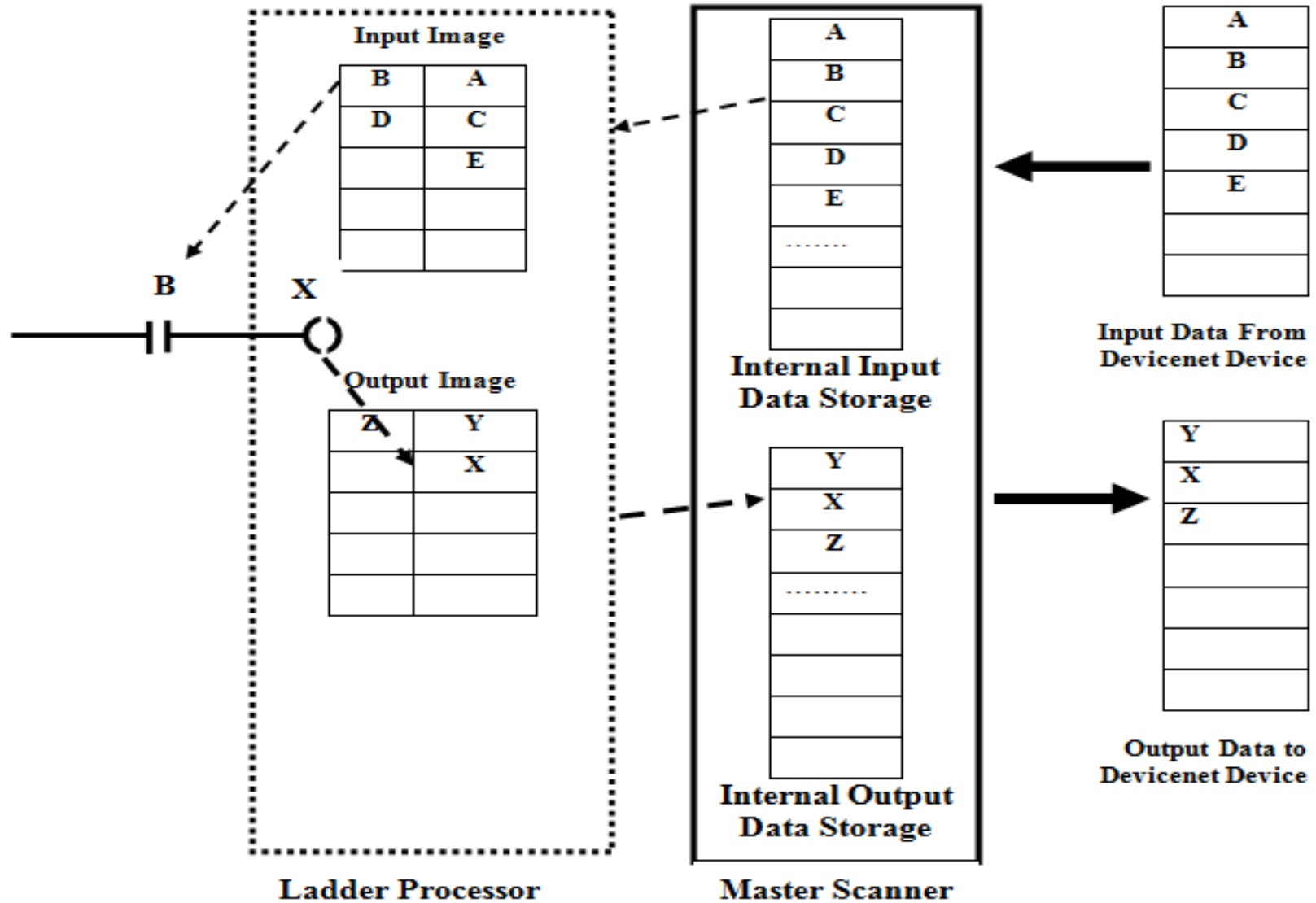
- Available Devices:** (Empty list)
- Scanlist:**
 - 03, PowerFlex 700S 2 20...
 - 15, 1794-ADN DeviceNet...

The **Edit I/O Parameters : 03, PowerFlex 700S 2 208V 4.8A** dialog box is open, showing the following settings:

- Strobed:**
 - Strobed
 - Input Size: 0 Bytes
 - Use Output Bit:
- Polled:**
 - Polled
 - Input Size: 8 Bytes
 - Output Size: 8 Bytes
 - Poll Rate: Every Scan
- Change of State / Cyclic:**
 - Change of State / Cyclic
 - Change of State
 - Cyclic
 - Input Size: 8 Bytes
 - Output Size: 0 Bytes
 - Heartbeat Rate: 250 msec

Buttons: OK, Cancel, Restore I/O Sizes, Advanced...

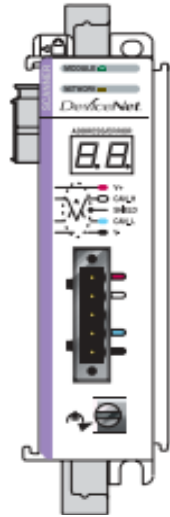
MASTER SCANNER DATA FLOW



MASTER SCANNER

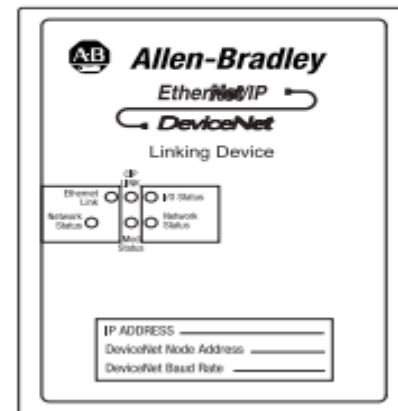
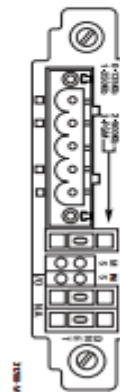
CompactLogix™ Scanner 1769-SDN

ControlLogix® Scanner 1756-DNB

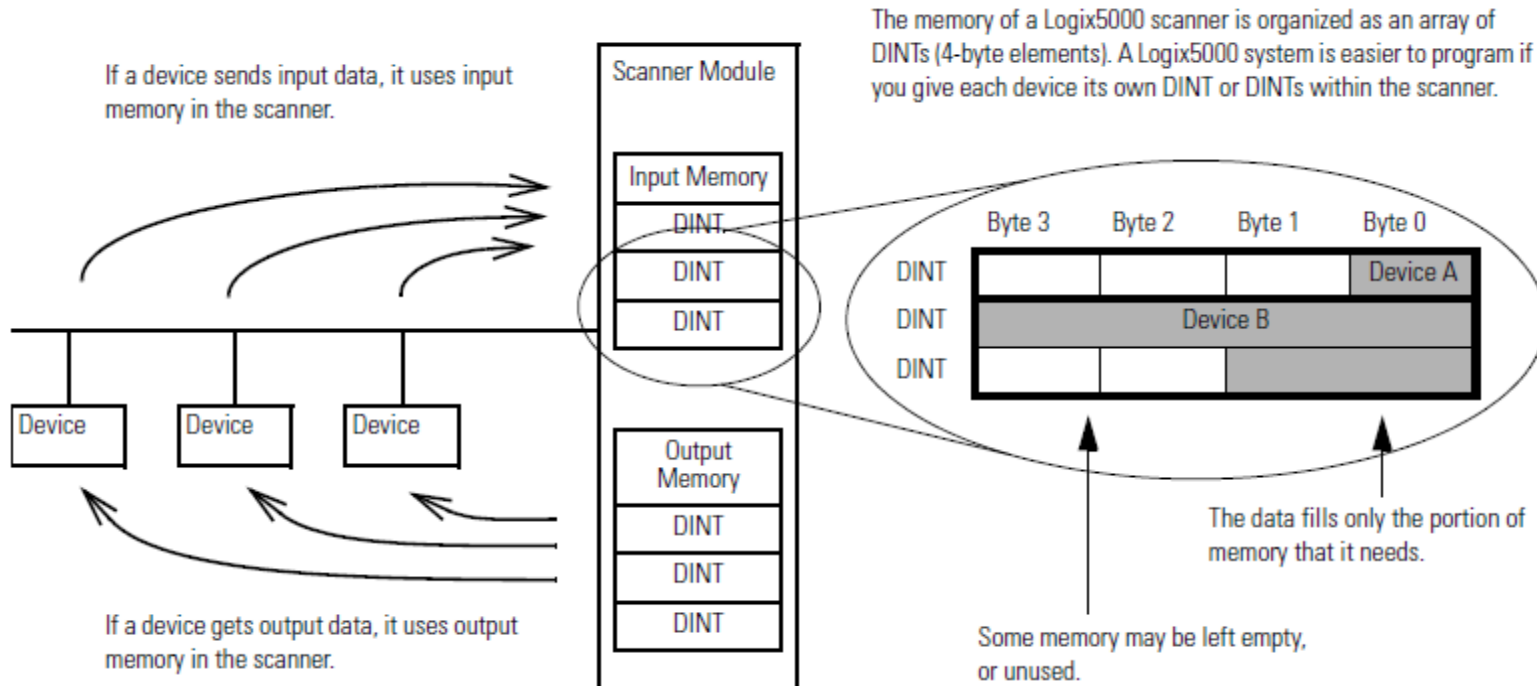


DriveLogix™ and FlexLogix™
Communication Card 1788-DNBO

EtherNet/IP to DeviceNet Linking
Device 1788-EN2DN



SCANNER MEMORY



Check the I/O Limits of the Scanner

Once you tally the input and output data for the network, make sure it is within the limits of the scanner. If they exceed the limits, use multiple scanners.

Scanner	Maximum input data (DINTs)	Maximum output data (DINTs)
1756-DNB	124	123
1769-SDN	90	90
1788-CN2DN	124	123
1788-EN2DN	124	123
1788-DNBO	124	123

DEVICENET SLAVES

POINT™ I/O Interface
1734-PDN



POINT™ I/O Adapter
1734-ADN and 1734-ADNX



POINT™ Block I/O Module
1734D



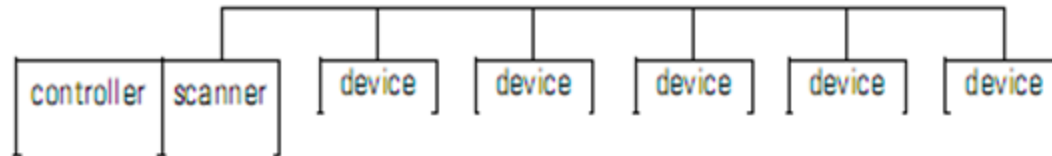
FLEX™ I/O Adapter
1794-ADN



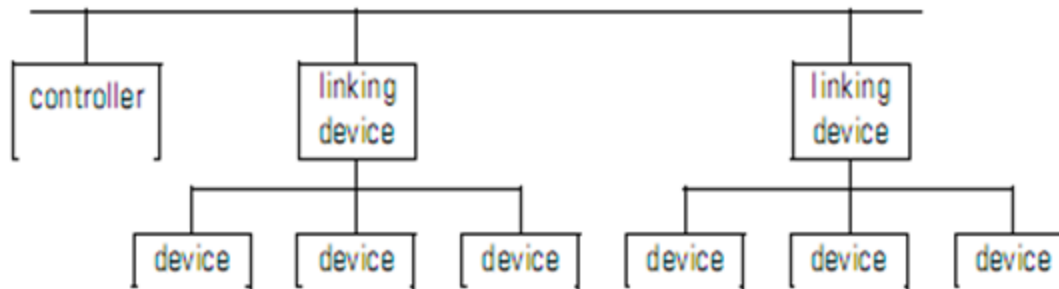
DEVICENET NETWORK CONFIGURATION

- 1. Choose whether to use a single network or several distributed networks.

- single network



- several smaller distributed networks (subnets)



- 2. Choose a scanner.

If you are using:

And the main network is:

Use this scanner:

single network



Corresponding scanner for your controller

subnets

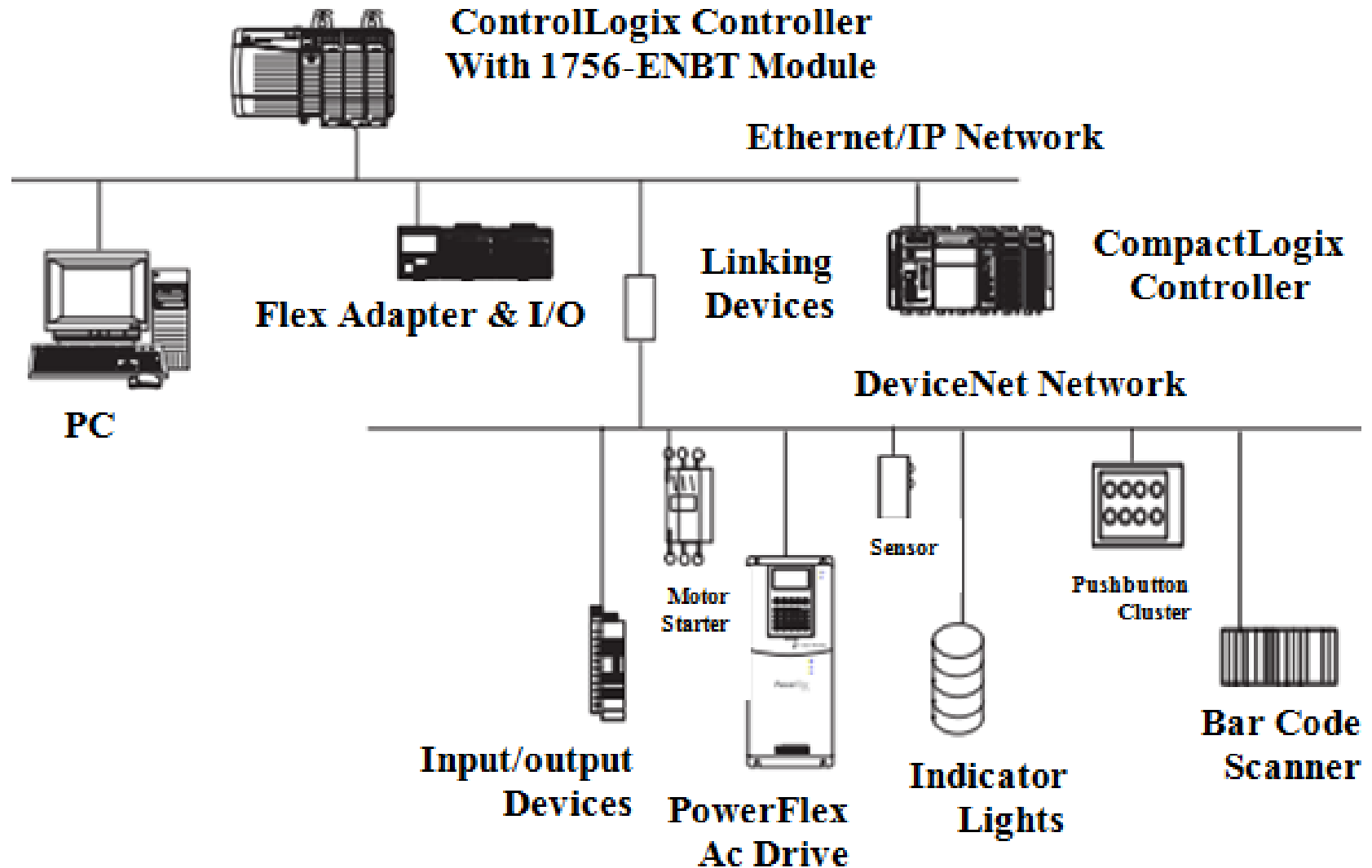
EtherNet/IP

EtherNet/IP to DeviceNet Linking Device 1788-EN2DN

ControlNet™

ControlNet to DeviceNet Linking Device 1788-CN2DN

DEVICENET NETWORK CONFIGURATION



DEVICENET NETWORK CONFIGURATION

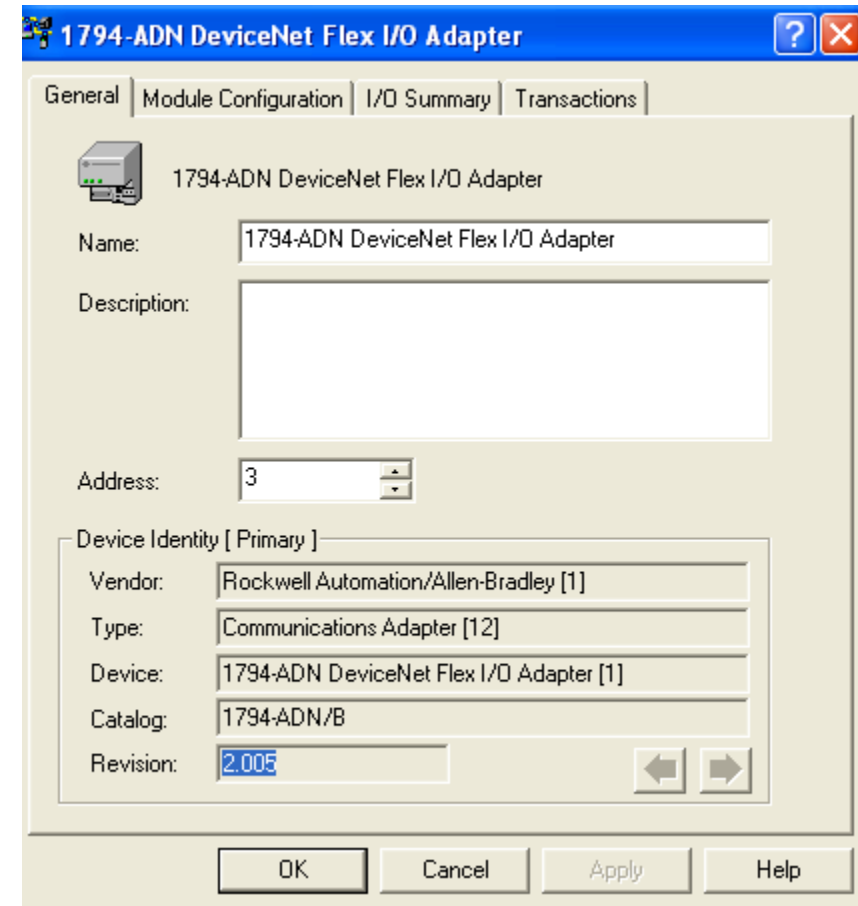
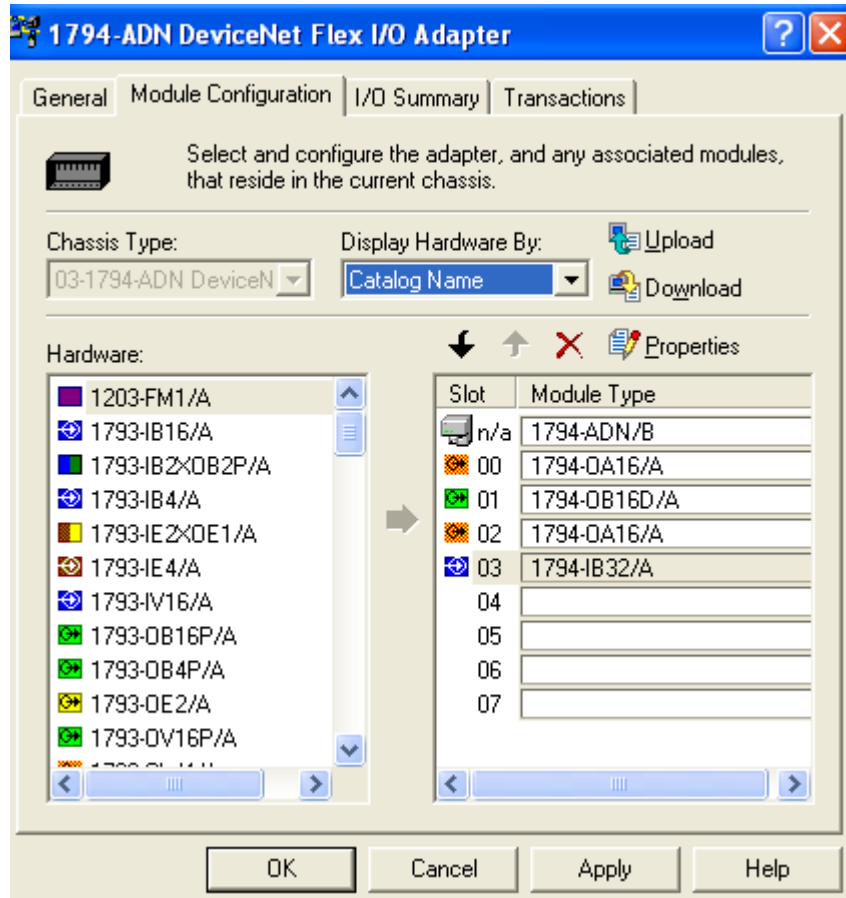
Configure I/O modules for Slaves by RSnetwork for Devicenet

The screenshot shows the RSNetWorx for DeviceNet software interface. The main window displays a rack configuration with two modules: a 1769-SDN Scanner Module in slot 00 and a 1794-ADN DeviceNet Flex I/O Adapter in slot 02. An inset window titled "1794-ADN DeviceNet Flex I/O Adapter" shows the "Module Configuration" tab. This window contains a table of modules in slots 00 through 07. A black arrow points from the slot 02 module in the main window to the slot 02 entry in the inset window's table.

Slot	Module Type
n/a	1794-ADN/B
00	1794-IB32/A
01	1794-IB16D/A
02	1794-OB16/A
03	1794-OB16D/A
04	1794-IA16/A
05	1794-OA16/A
06	
07	

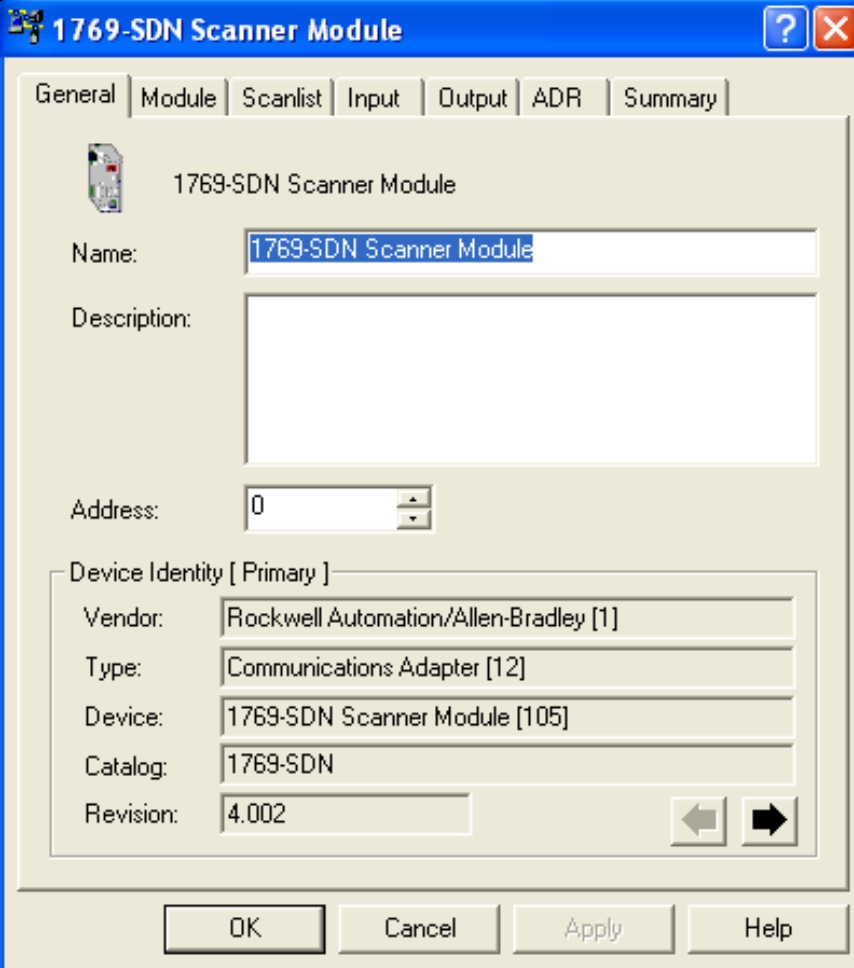
DEVICENET NETWORK CONFIGURATION

Configure offline



DEVICENET NETWORK CONFIGURATION

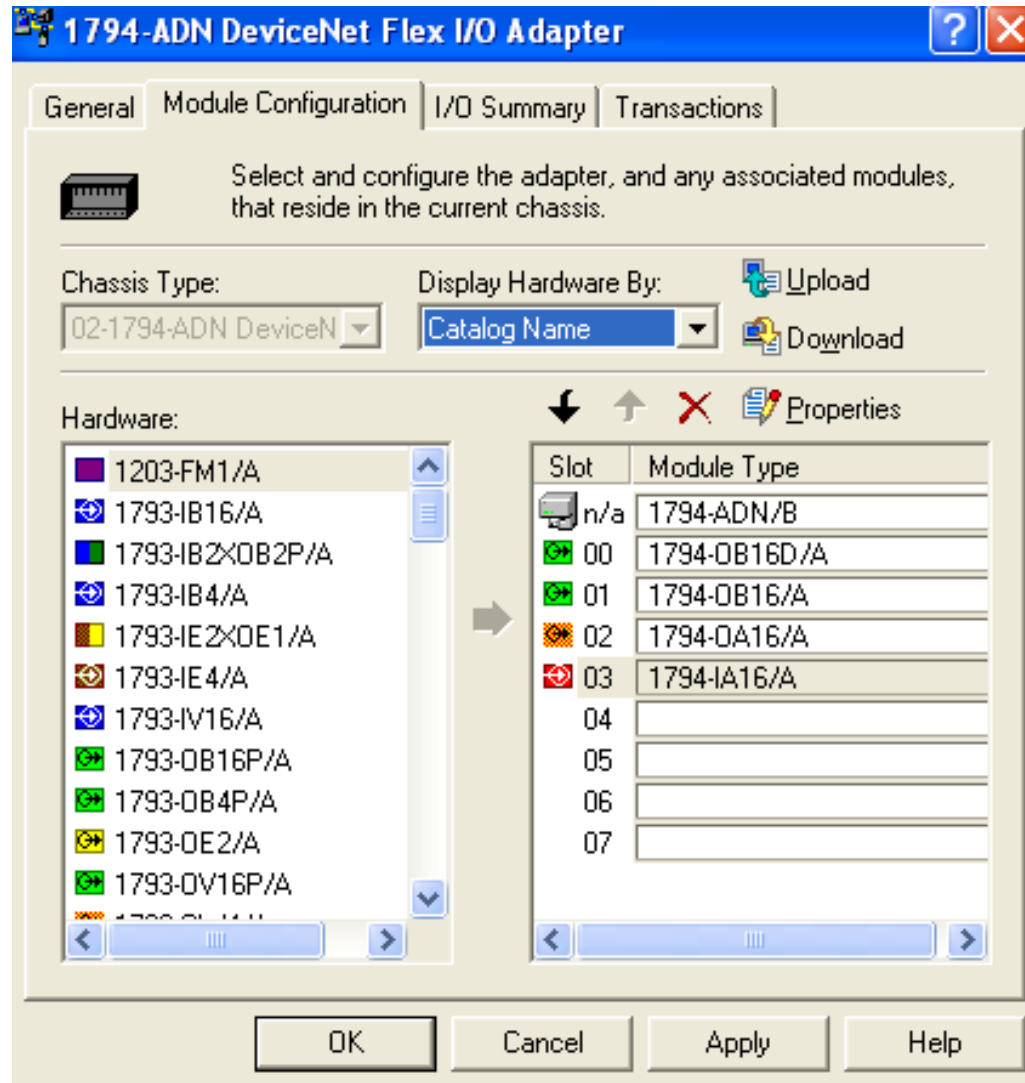
Configure offline



The image shows a configuration window titled "1769-SDN Scanner Module". The window has a blue title bar with a question mark icon and a close button. Below the title bar are several tabs: "General", "Module", "Scanlist", "Input", "Output", "ADR", and "Summary". The "General" tab is selected. The main area contains a small icon of the scanner module and the text "1769-SDN Scanner Module". Below this, there are fields for "Name" (containing "1769-SDN Scanner Module"), "Description" (empty), and "Address" (containing "0"). A section titled "Device Identity [Primary]" contains several fields: "Vendor" (Rockwell Automation/Allen-Bradley [1]), "Type" (Communications Adapter [12]), "Device" (1769-SDN Scanner Module [105]), "Catalog" (1769-SDN), and "Revision" (4.002). At the bottom of the window are buttons for "OK", "Cancel", "Apply", and "Help".

DEVICENET NETWORK CONFIGURATION

Configure offline



DEVICENET NETWORK CONFIGURATION

Configure I/O address for modules in Master Scanner

1769-SDN Scanner Module

1794-ADN DeviceNet Flex I/O Adapter

02

1769-SDN Scanner Module

1794-ADN DeviceNet Flex I/O Adapter

02

1769-SDN Scanner Module

General | Module | Scanlist | Input | Output | ADR | Summary

Node	Type	Size	Map
02, 1794-...	Polled	16	1:I.Data[0].0
[n/a] 17...		2 By...	
[00] 1794-IB32/A,Data		2 By...	
[01] 179...		2 By...	
[02] 179...		2 By...	
[03] 179...		2 By...	

Memory: Discrete Start DWord: 0

Bits 31 - 0	
1:I.Data[0]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[1]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[2]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[3]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[4]	
1:I.Data[5]	
1:I.Data[6]	
1:I.Data[7]	
1:I.Data[8]	

1769-SDN Scanner Module

1794-ADN DeviceNet Flex I/O Adapter

02

1769-SDN Scanner Module

1794-ADN DeviceNet Flex I/O Adapter

02

1769-SDN Scanner Module

General | Module | Scanlist | Input | Output | ADR | Summary

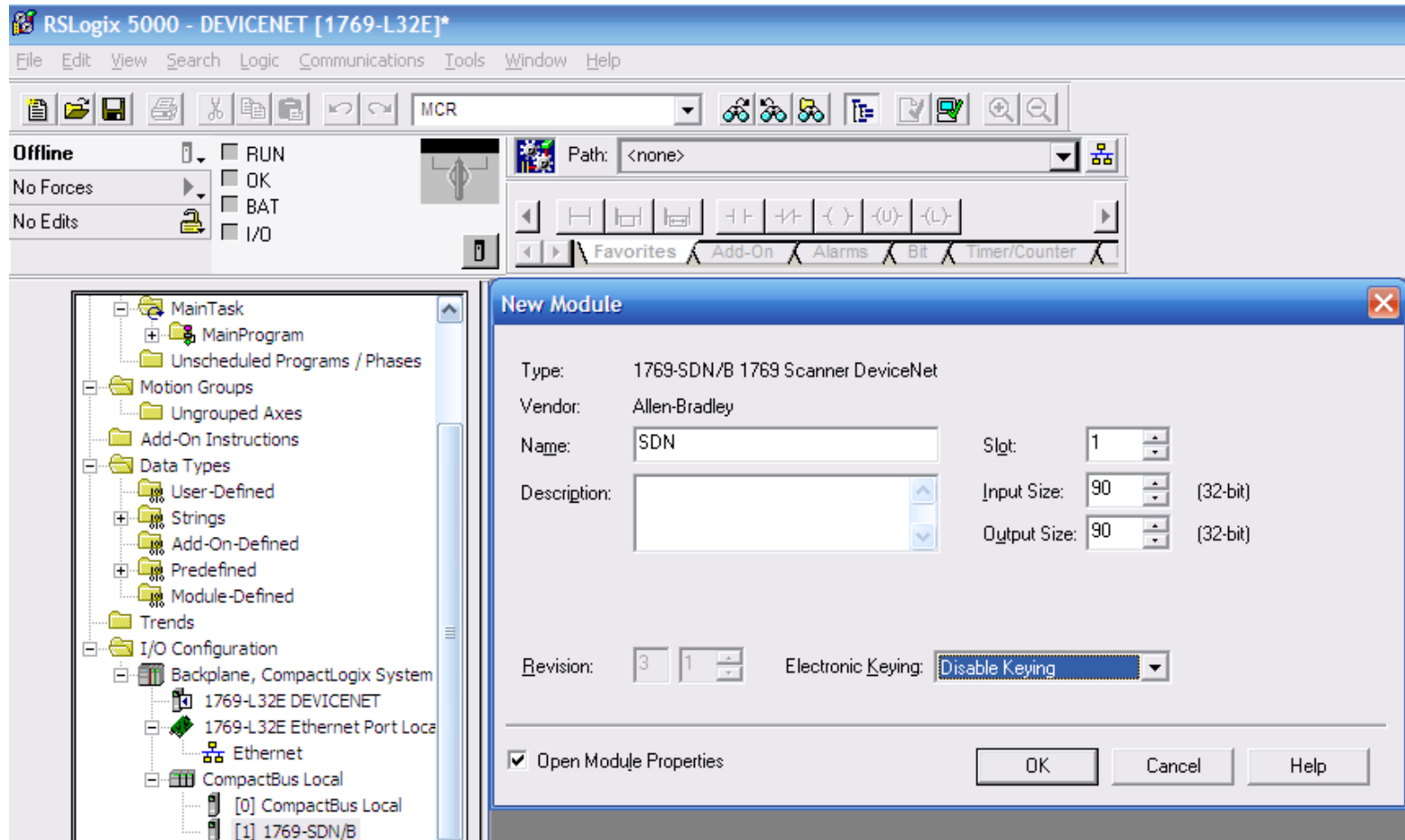
Node	Type	Size	Map
02, 179...	Polled	10	1:O.Data[0].0
[01] 17...		2 By...	
[02] 17...		2 By...	
[03] 1794-OB16D/A,Data		2 By...	
[04] 17...		2 By...	
[05] 17...		2 By...	

Memory: Discrete Start DWord: 0

Bits 31 - 0	
1:O.Data[0]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:O.Data[1]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:O.Data[2]	02, 1794-ADN Device...
1:O.Data[3]	
1:O.Data[4]	
1:O.Data[5]	
1:O.Data[6]	
1:O.Data[7]	
1:O.Data[8]	

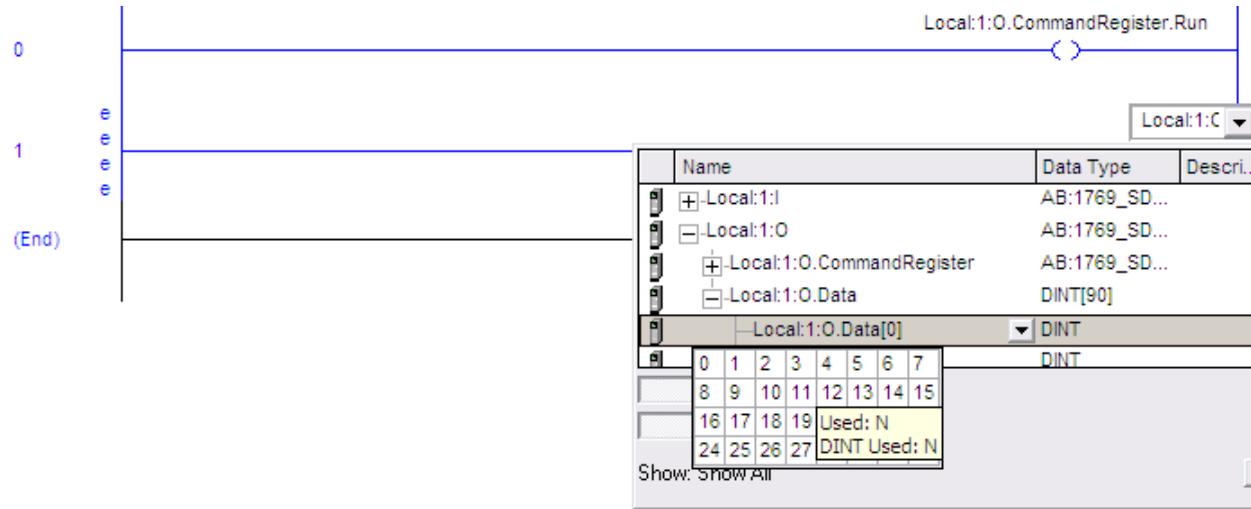
DEVICENET NETWORK CONFIGURATION

Insert Master Scanner into Project using RSLogix5000



DEVICENET NETWORK CONFIGURATION

Creating logic to exchange I/O data over Devicenet Network

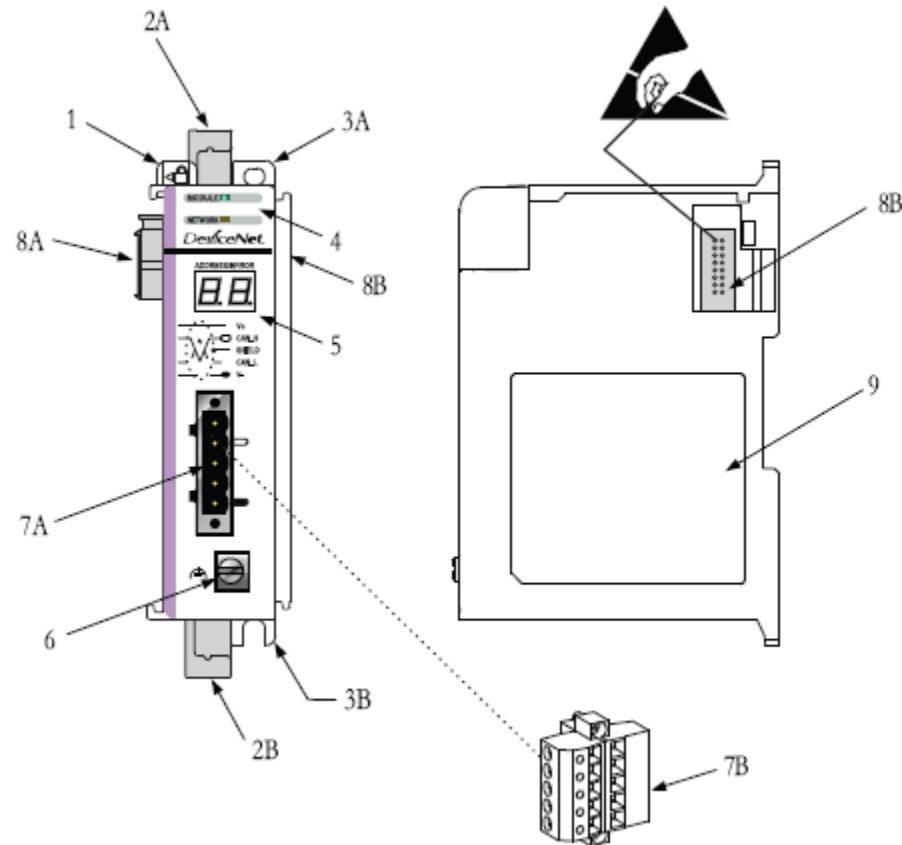


COMPACTLOGIX DEVICENET SCANNER

1769 SDN(Devicenet Master)

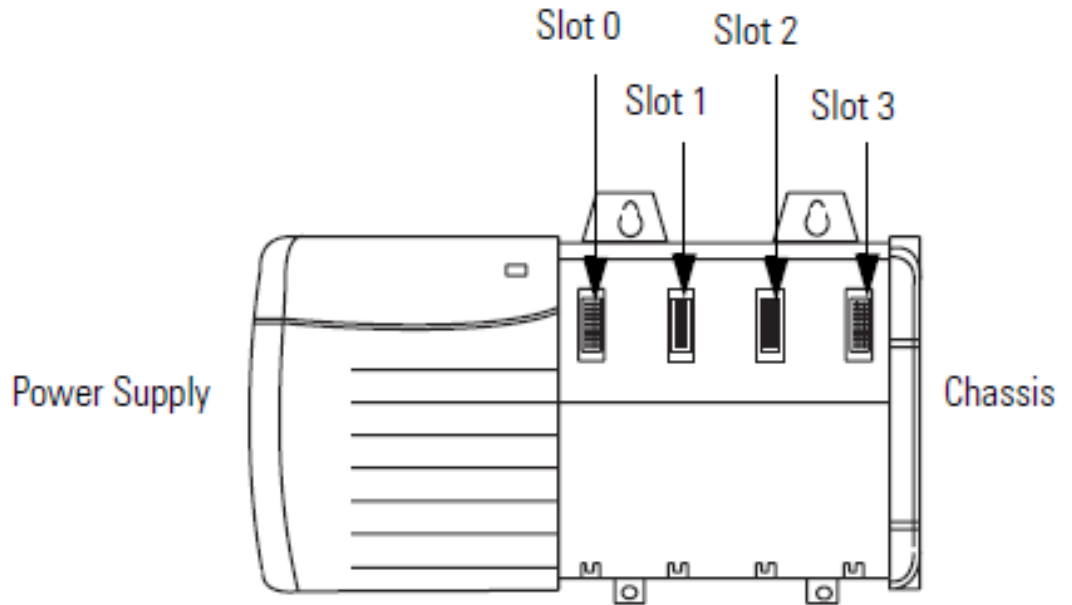
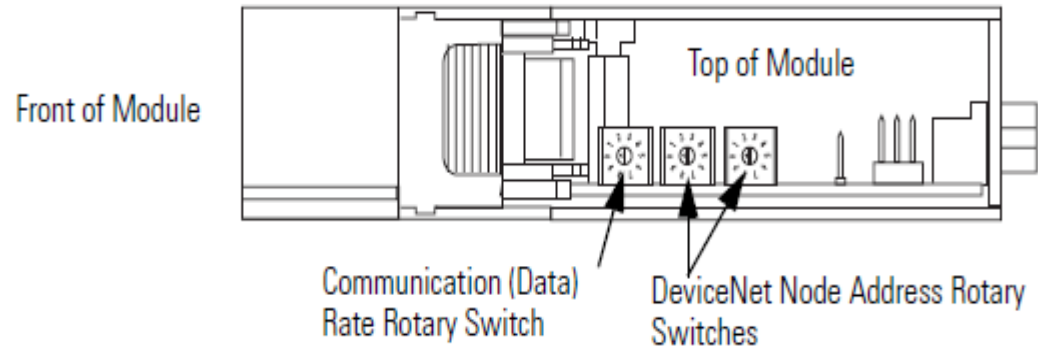
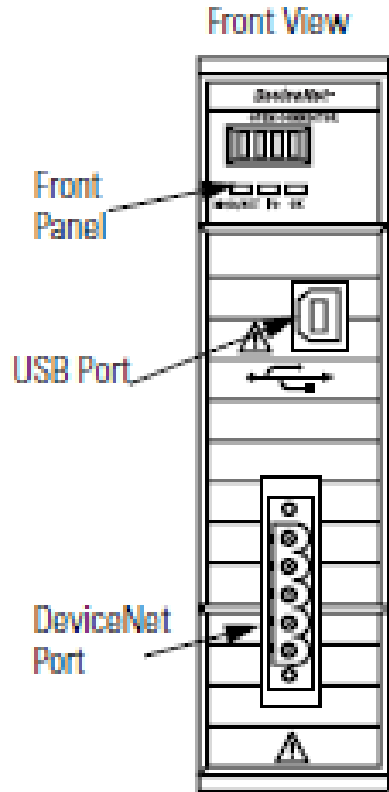
Module Features

Item	Description
1	Bus lever (with locking function)
2A	Upper DIN rail latch
2B	Lower DIN rail latch
3A	Upper panel mounting tab
3B	Lower panel mounting tab
4	Module and Network status LEDs
5	Address and Error numeric display
6	Grounding screw
7A	DeviceNet mating male receptacle
7B	Removable DeviceNet female connector
8A	Movable bus connector with female pins
8B	Bus connector with male pins
9	Nameplate label



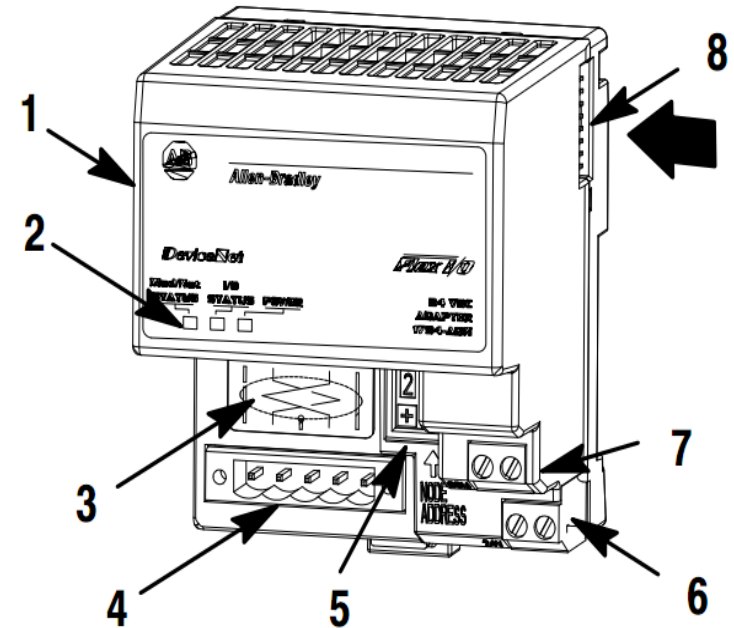
CONTROLNET DEVICENET SCANNER

1756 DNB (Devicenet Master)



DEVICENET SLAVE

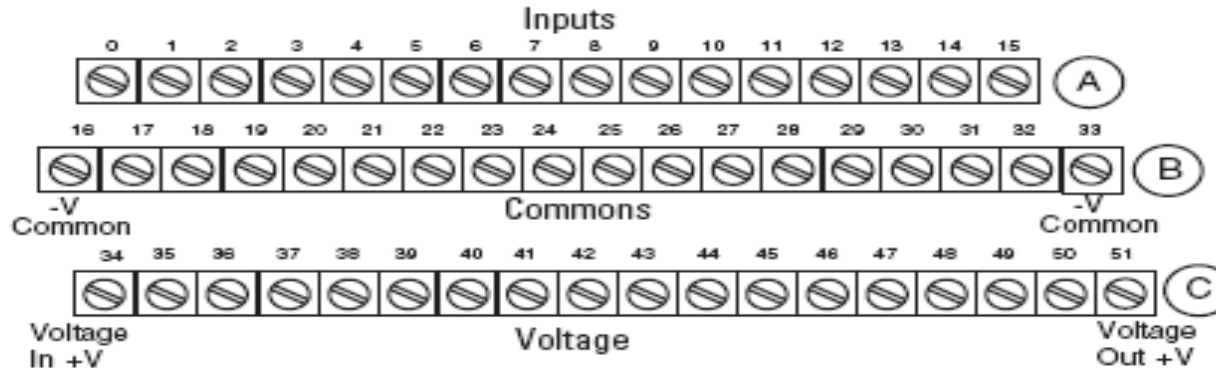
1794 ADN(DeviceNet Slave)



DEVICENET I/O MODULES

Flex I/O 1794-IB8, IB16.

1794-TB3 and -TB3S Terminal Base Wiring for 1794-IB8, -IB16, and -IB16K



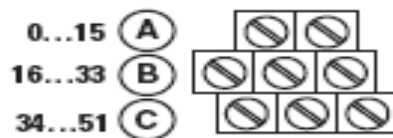
Connect V common to terminal B-16.

Connect +V to terminal C-34.

Use B-33 and C-51 to daisy-chain to the next terminal base unit.

(1794-TB3 shown)

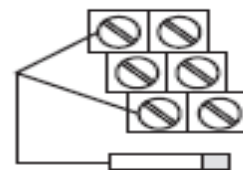
2- and 3-Wire Input Wiring for 1794-IB8, -IB16, and -IB16K



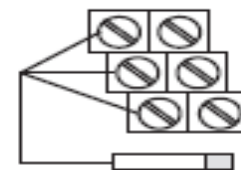
(A) = Sink input

(B) = Common

(C) = +V DC



2-Wire Device
(Sourcing Output)

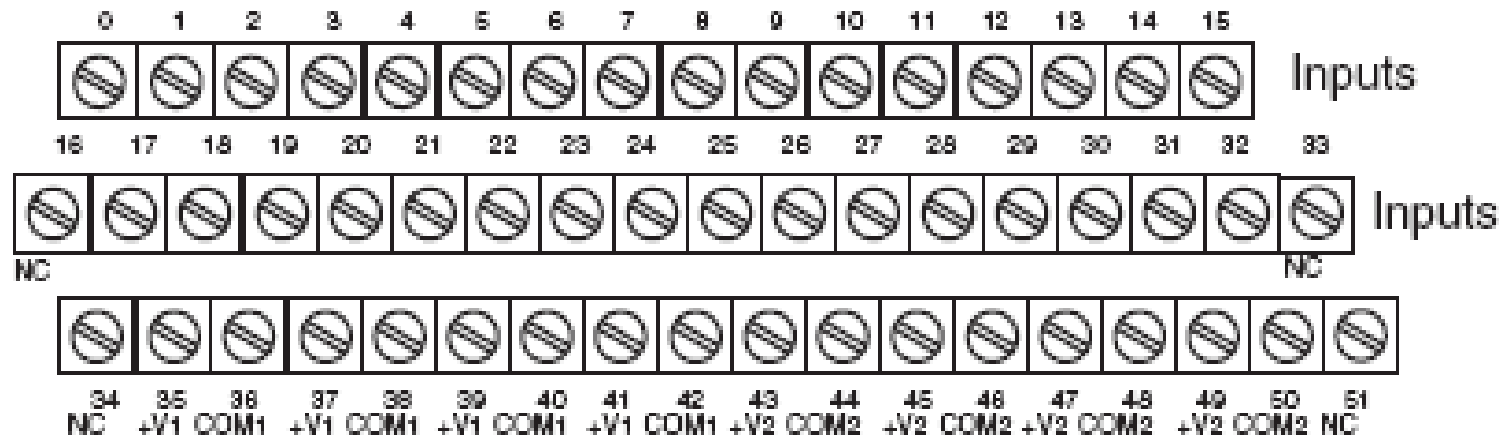


3-Wire Device
(Sourcing Output)

DEVICENET I/O MODULES

Flex I/O 1794-IB32

1794-TB32 or -TB32S Terminal Base Wiring for the 1794-IB32



+V1 = Terminals 35, 37, 39, and 41 (1794-TB32 shown)

+V2 = Terminals 43, 45, 47, and 49

COM1 = Terminals 36, 38, 40, and 42

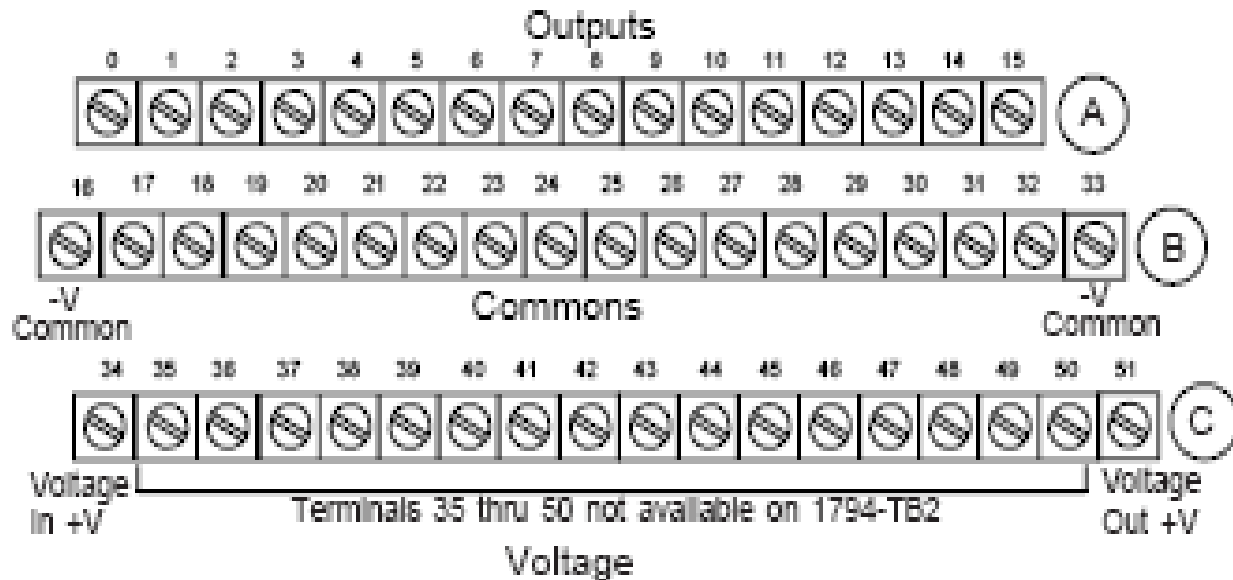
COM2 = Terminals 44, 46, 48, and 50

NC = No connections (terminals 16, 33, 34, and 51)

DEVICENET I/O MODULES

Flex I/O 1794-OB18,OB16.

1794-TB2, -TB3 and -TB3S Terminal Base Wiring for 1794-OB8, -OB8EP, -OB8EPK, -OB16, -OB16P and -OB16PK



Connect -V (Supply Common) to terminal B-16

(1794-TB3 shown)

Connect +V (Supply +Voltage) to terminal C-34

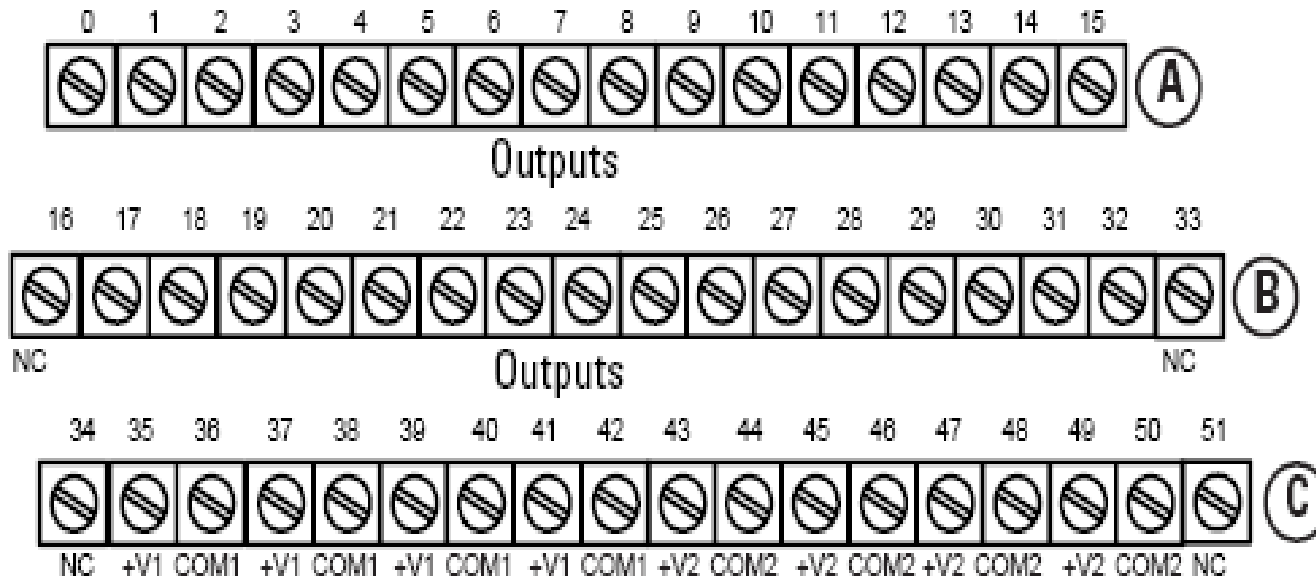
(Use B-33 and C-51 for daisy-chaining to next terminal base unit.)

Total current draw through the terminal base is limited to 10A. Separate power connections to each terminal base may be necessary.

DEVICENET I/O MODULES

Flex I/O 1794-OB32.

1794-TB32 and -TB32S Terminal Base Wiring for 1794-OB32P



+V1 = Terminals 35, 37, 39 and 41

(1794-TB32 shown)

+V2 = Terminals 43, 45, 47 and 49

COM1 = Terminals 36, 38, 40 and 42

COM2 = Terminals 44, 46, 48 and 50

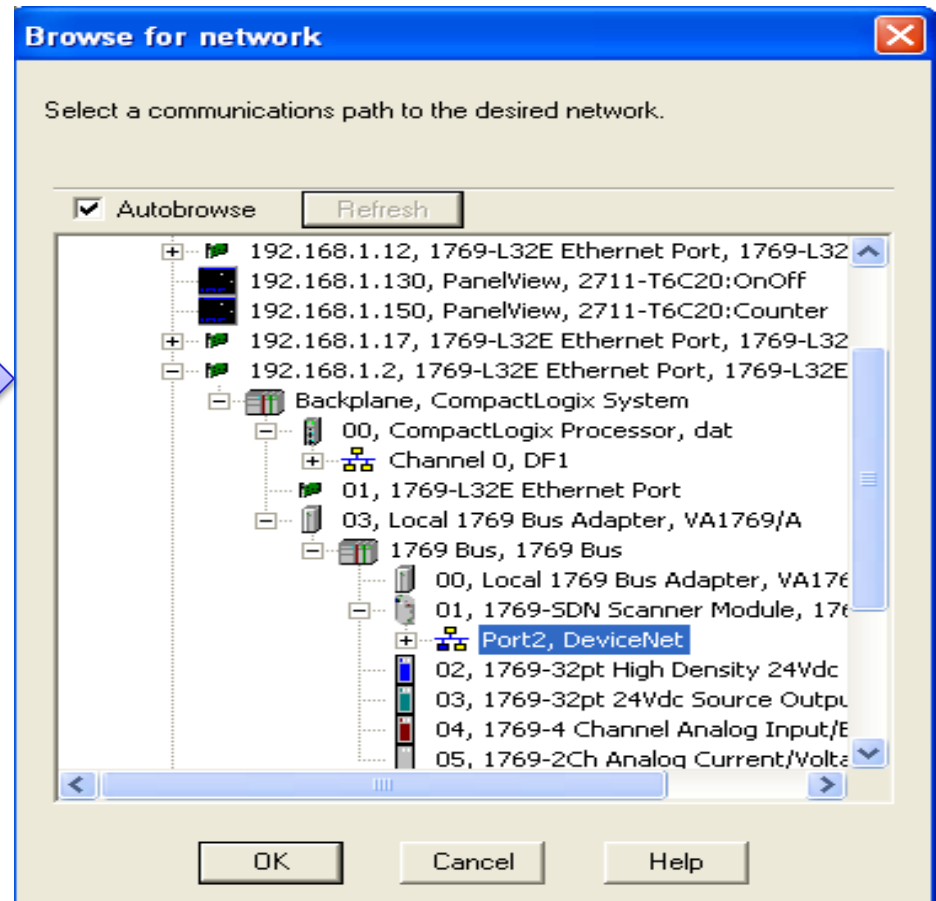
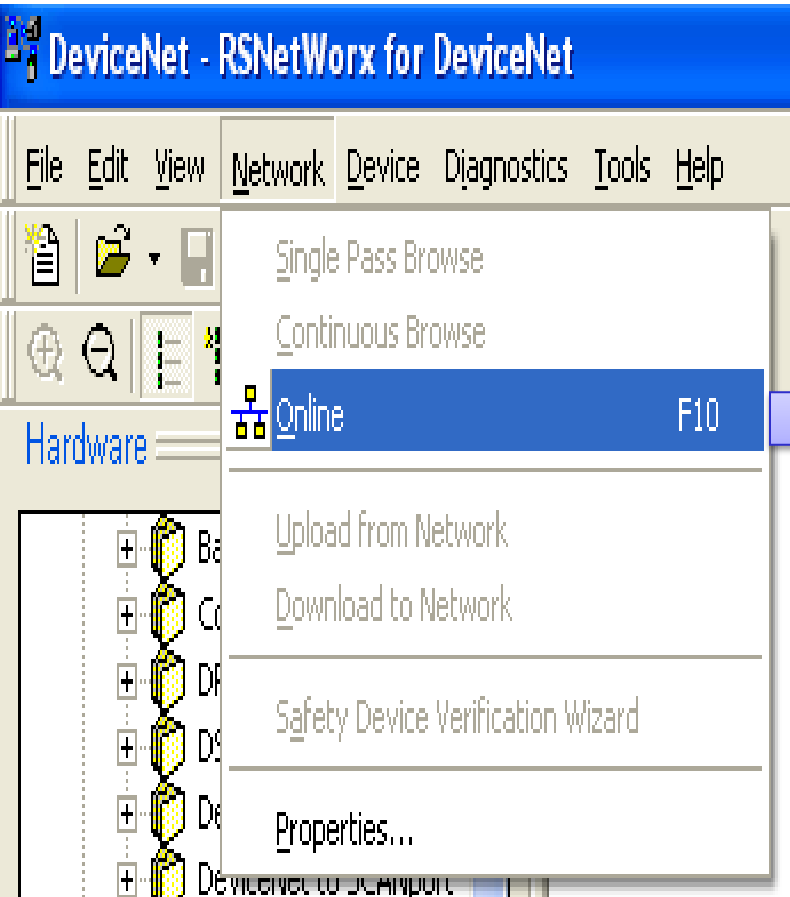
NC = No connections (terminals 16, 33, 34 and 51)

CONTROL DEVICES VIA D_NET

1. Connecting Devices to DeviceNet Network
2. Setting the address of Scanner and other devices
3. Creating Scanlist file by RSnetwork for devicenet
4. Configuring I/O memory area of modules
5. Downloading the configuration to Scanner
6. Creating a Project in RSlogix5000
7. Writing logic program
8. Downloading the program to PLC

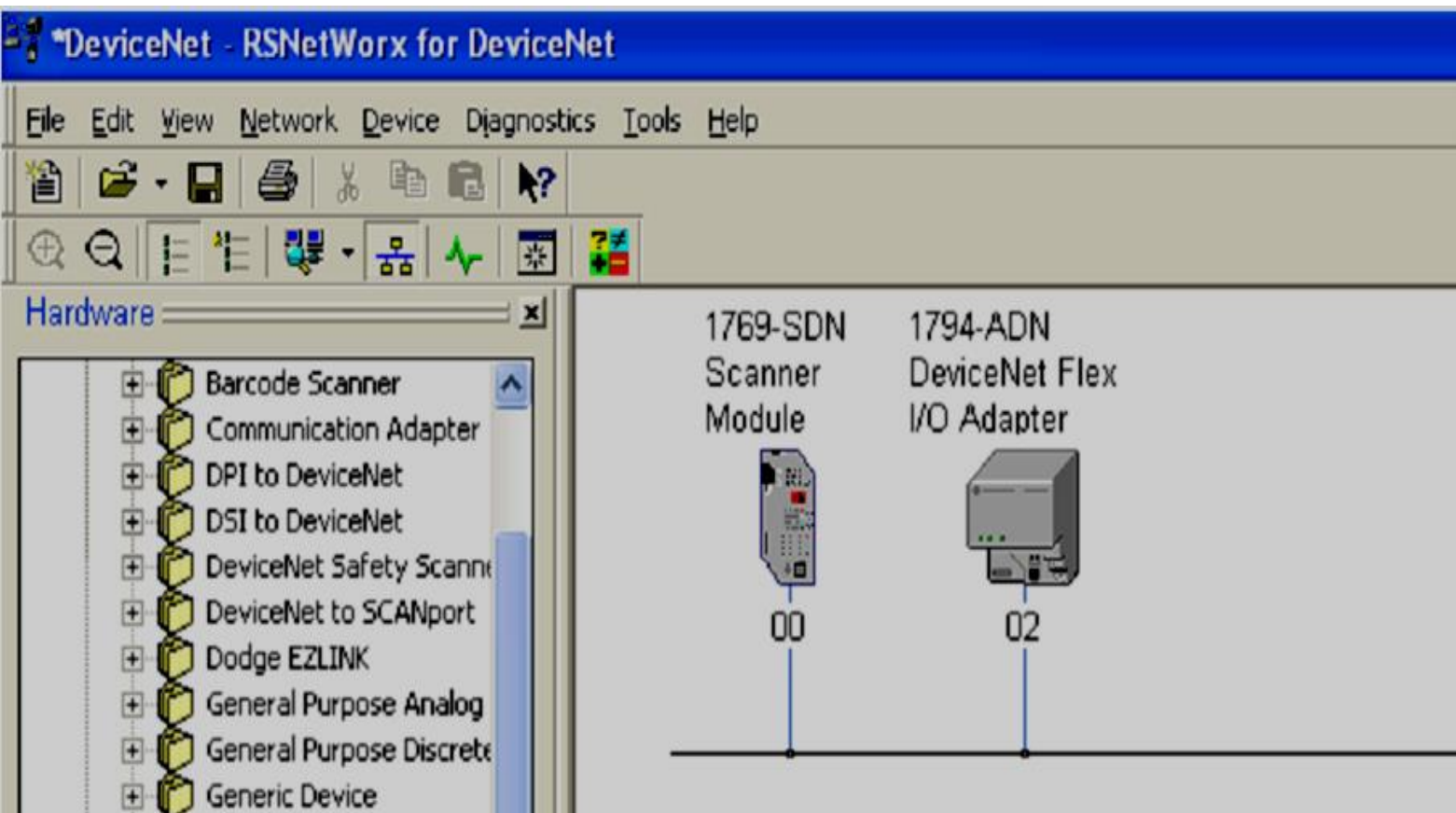
CONTROL DEVICES VIA D_NET

- Creating Scanlist file by Rsnetwork for Dnet



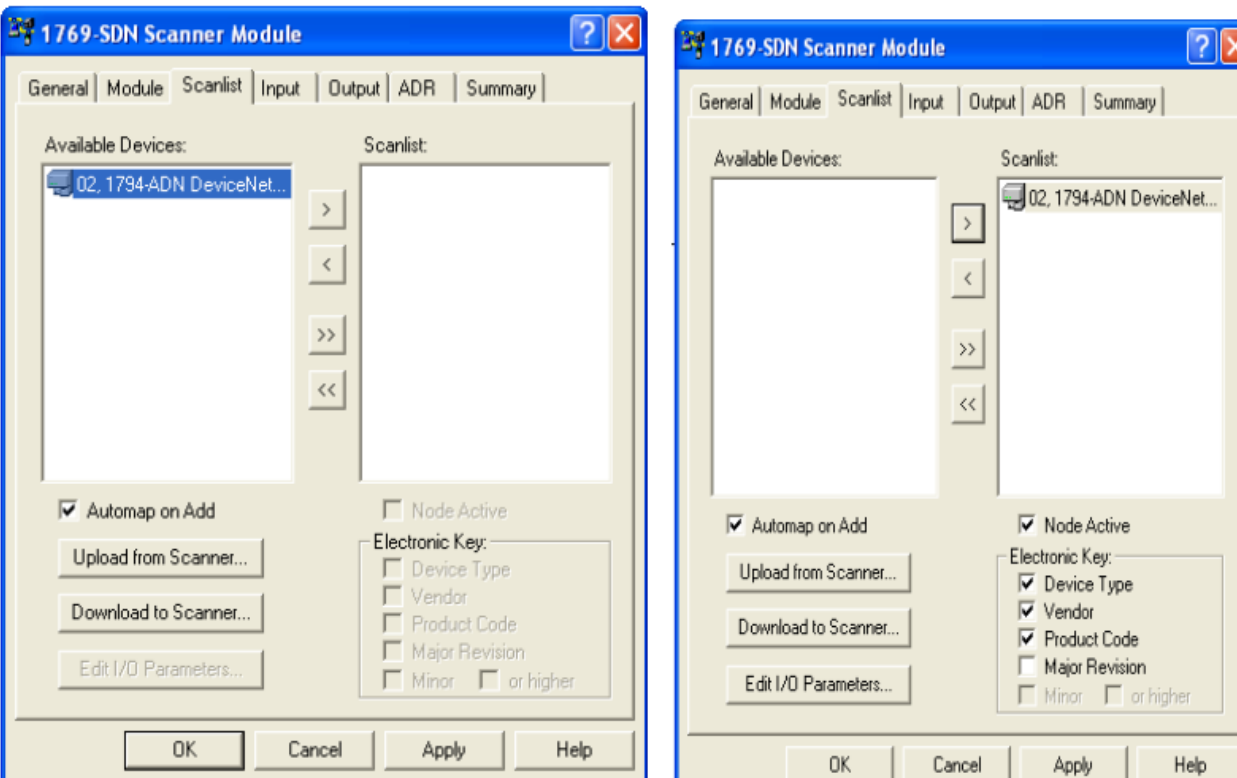
CONTROL DEVICES VIA D_NET

Depend on system hardware, Scanlist file is different



CONTROL DEVICES VIA D_NET

Add devices to Scanlist



Select Scanner module/upload/ Click Scanlist tab/ choose devices to add to Scanlist

CONTROL DEVICES VIA D_NET

Specify I/O memory areas of modules at Input and Output tab then download to Scanner module.

1769-SDN Scanner Module
1794-ADN DeviceNet Flex I/O Adapter



1769-SDN Scanner Module
1794-ADN DeviceNet Flex I/O Adapter



Node	Type	Size	Map
02, 1794-...	Polled	16	1:I.Data[0].0
[n/a] 17...		2 By...	
[00] 1794-IB32/A,Data		2 By...	
[01] 179...		2 By...	
[02] 179...		2 By...	
[03] 179...		2 By...	

Memory: Discrete Start DWord: 0

Bits 31 - 0	
1:I.Data[0]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[1]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[2]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[3]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:I.Data[4]	
1:I.Data[5]	
1:I.Data[6]	
1:I.Data[7]	
1:I.Data[8]	

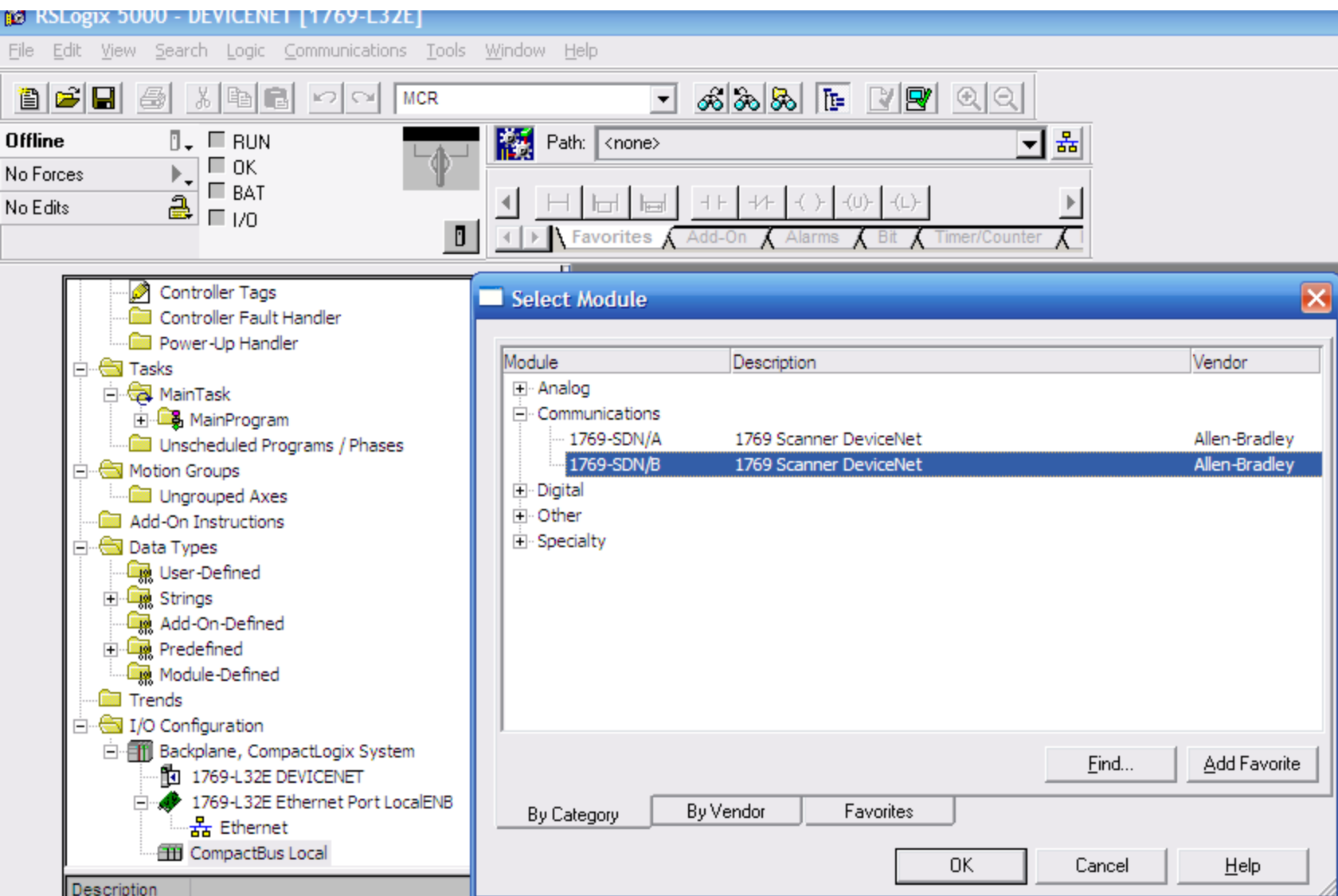
Node	Type	Size	Map
02, 179...	Polled	10	1:O.Data[0].0
[01] 17...		2 By...	
[02] 17...		2 By...	
[03] 1794-OB16D/A,Data		2 By...	
[04] 17...		2 By...	
[05] 17...		2 By...	

Memory: Discrete Start DWord: 0

Bits 31 - 0	
1:O.Data[0]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:O.Data[1]	02, 1794-ADN DeviceNet Flex I/O Adapter
1:O.Data[2]	
1:O.Data[3]	
1:O.Data[4]	
1:O.Data[5]	
1:O.Data[6]	
1:O.Data[7]	
1:O.Data[8]	

CONTROL DEVICES VIA D_NET

- Creating a project in RSLogix5000 and add a Scanner



CONTROL DEVICES VIA D_NET

Configuring the Scanner Module

The screenshot displays the RSLogix 5000 - DEVICENET [1769-L32E]* interface. The main window shows a project tree on the left with folders like MainTask, Motion Groups, and I/O Configuration. The I/O Configuration folder is expanded, showing a 1769-L32E DEVICENET module. A 'New Module' dialog box is open, showing the configuration for a 1769-SDN/B 1769 Scanner DeviceNet module. The configuration includes the following fields:

- Type: 1769-SDN/B 1769 Scanner DeviceNet
- Vendor: Allen-Bradley
- Name: SDN
- Slot: 1
- Description: (empty)
- Input Size: 90 (32-bit)
- Output Size: 90 (32-bit)
- Revision: 3 1
- Electronic Keying: Disable Keying

The 'Open Module Properties' checkbox is checked. The dialog box has OK, Cancel, and Help buttons.

CONTROL DEVICES VIA D_NET

Writing a simple program in Rslogix 5000.

Name	Data Type	Descri...
+Local:1:I	AB:1769_SD...	
-Local:1:O	AB:1769_SD...	
-Local:1:O.CommandRegister	AB:1769_SD...	
Local:1:O.CommandRegister.Run	BOOL	

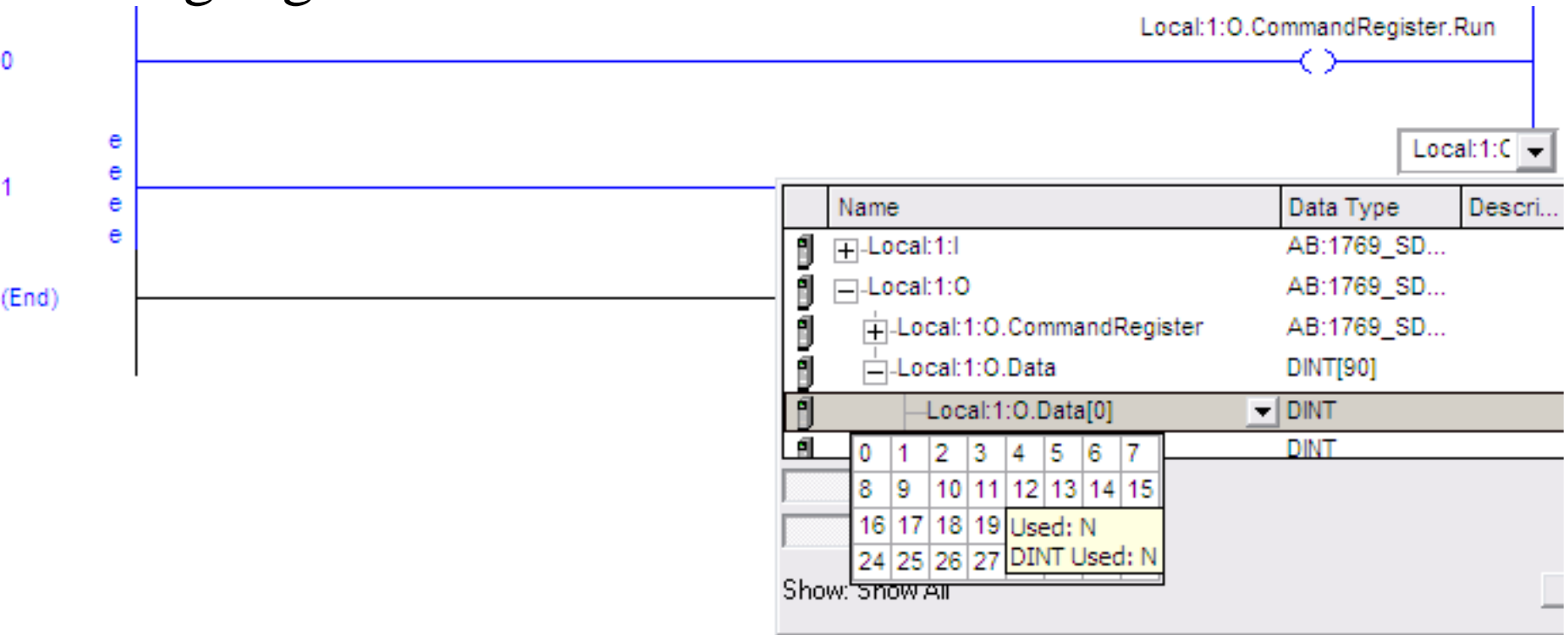
Controller
Program
Show: Show All

Name: Local:1:O.CommandRegister.Run
Data Type: BOOL
Description:

Notice: **CommandResister.Run** instruction must be executed to run devicenet network

CONTROL DEVICES VIA D_NET

Writing logic to access I/O modules.



DEVICENET NETWORK TROUBLE SHOOTING

Status code (decimal)	Description	Action
65	The AutoScan option is on and the device is in idle mode.	None.
70	The address of the device is already in use by another device on the network.	Change the address of the device to an unused address.
71	Illegal data in scan list.	Reconfigure the scan list and remove any illegal data.
72	No communication with the device.	Inspect the device and verify connections.
73	Device's identity information does not match electronic key in scanner	<ul style="list-style-type: none">• Make sure that the correct device is at this address.• Make sure that the device matches the specified electronic key (vendor, product code, product type).
74	Data overrun on port detected.	<ul style="list-style-type: none">• Modify your configuration and check for invalid data.• Check network communication traffic.
75	Either or both of the following: <ul style="list-style-type: none">• The device does <i>not</i> have a scan list.• The device has <i>not</i> received communication from any other device	Check that the device has: <ul style="list-style-type: none">• scan list• properly wired connection to the network
76	No direct network traffic for scanner.	None. The scanner hears other network communication but does <i>not</i> hear any directed to it.
77	During initialization, the data size expected by the device does <i>not</i> match the scan list entry.	Check the device and the scan list for the correct input and output size for the device.

DEVICENET NETWORK TROUBLE SHOOTING

78	Device is <i>not</i> communicating or communication is intermittent.	<ul style="list-style-type: none">• Check that the device has a properly wired connection to the network.• Check that the device has power.• If the device is polled, make sure the interscan delay is long enough for the device to return its data.
79	Scanner has failed to transmit a message.	<ul style="list-style-type: none">• Make sure that your scanner is connected to a valid network.• Check for disconnected cables.
80	Scanner is in idle mode.	To run the network: <ol style="list-style-type: none">1. Put controller in run/remote run mode.2. Turn on the following member of command register for the scanner:
81	Controller has set the scanner to the faulted mode.	See if the following bit of the command register for the scanner is on: ...O.CommandRegister.Fault
82	Error detected in sequence of fragmented I/O messages from device.	<ul style="list-style-type: none">• Check scan list device to make sure that its input and output data sizes are correct.• Check the configuration of the device.
83	Device returns error responses when the scanner attempts to communicate with it.	<ul style="list-style-type: none">• Check the accuracy of the scan list.• Check the configuration of the device. The device may be in another scanner's scan list.• Cycle power to the device.
84	Scanner is initializing the DeviceNet network.	None. This code clears itself once the scanner attempts to initialize all the devices on the network.

DEVICENET NETWORK TROUBLE SHOOTING

85	During runtime, the device is sending the wrong size of data.	Contact Rockwell Automation support. See the back of this publication.
86	Device is in idle state/mode (<i>not</i> producing data) while the scanner is in run mode.	<ul style="list-style-type: none">• Check the configuration and status of the device.• If you set up an interlock between 2 scanners (controllers), make sure both scanners are in run mode.
88	In shared inputs, the I/O parameters (polled, strobed, etc.) <i>do not</i> match between the scanners.	Use the same I/O parameters for the device in both scanners.
89	Scanner failed to configure a device using the Automatic Device Recovery (ADR) parameters	<ul style="list-style-type: none">• Make sure that you installed a compatible device.• The offline configuration for the device does not match the actual (online) configuration of the device.
90	Controller has set the scanner to the disabled mode.	See if the following bit of the command register for the scanner is on: ...0.CommandRegister.DisableNetwork
91	Bus-off condition (communication problem)	<ul style="list-style-type: none">• Cycle power to the device.• Make sure all devices are at the same baud rate.• Make sure there is <i>no</i> short circuit between a CAN line (blue or white) and a power or shield line (black, red, shield).• Check for any of the following sources of noise:<ul style="list-style-type: none">• Close proximity to a high voltage power cable• Improper or no termination resistor• Improper grounding• Check for a device that is producing noise or inappropriate data on the network.

DEVICENET NETWORK TROUBLE SHOOTING

92	The DeviceNet cable is <i>not</i> supplying power to the communication port.	<ul style="list-style-type: none">• Make sure the network has 24V dc power.• Check the connection to the device.
95	The firmware of the device is currently being updated.	None. Do not disconnect the device while the update is in progress. You will lose any existing data in the device's memory.
96	Communication port is in test mode.	None.
97	Controller has set the scanner to the halted mode.	<ol style="list-style-type: none">1. See if the following bit of the command register for the scanner is on: ...0.CommandRegister.HaltScanner2. Cycle power to the scanner.
98	General firmware error.	Replace device.
99	System failure.	Replace device.

CONTROL DEVICES VIA D_NET

EX_1

Set up a devicenet network includes two nodes.

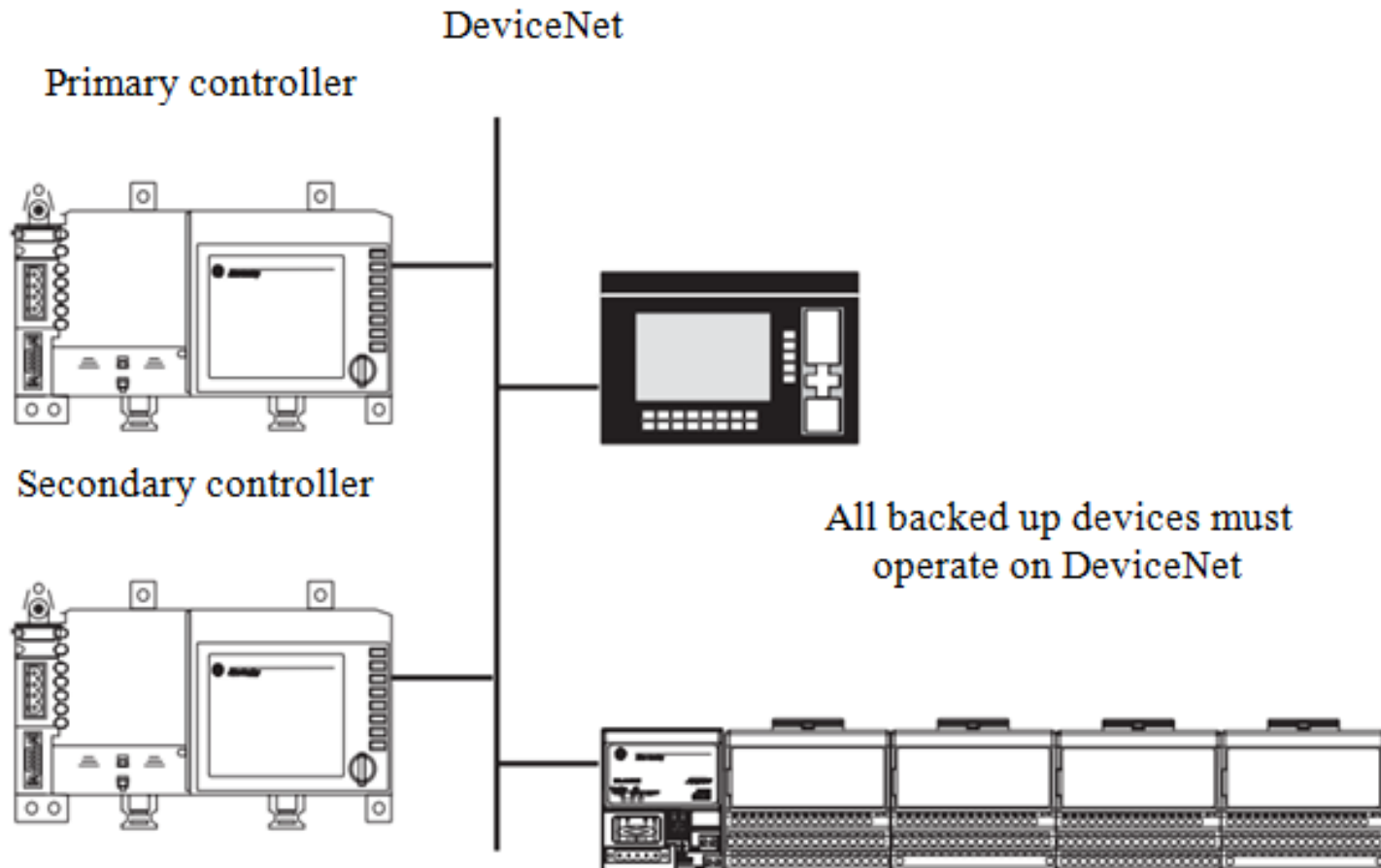
- Scanner has Address 0
- Slave has Address 4 and I/O modules
- Two buttons and one Motor are connected to I/O devicenet modules to Start and Stop the Motor.

EX_2

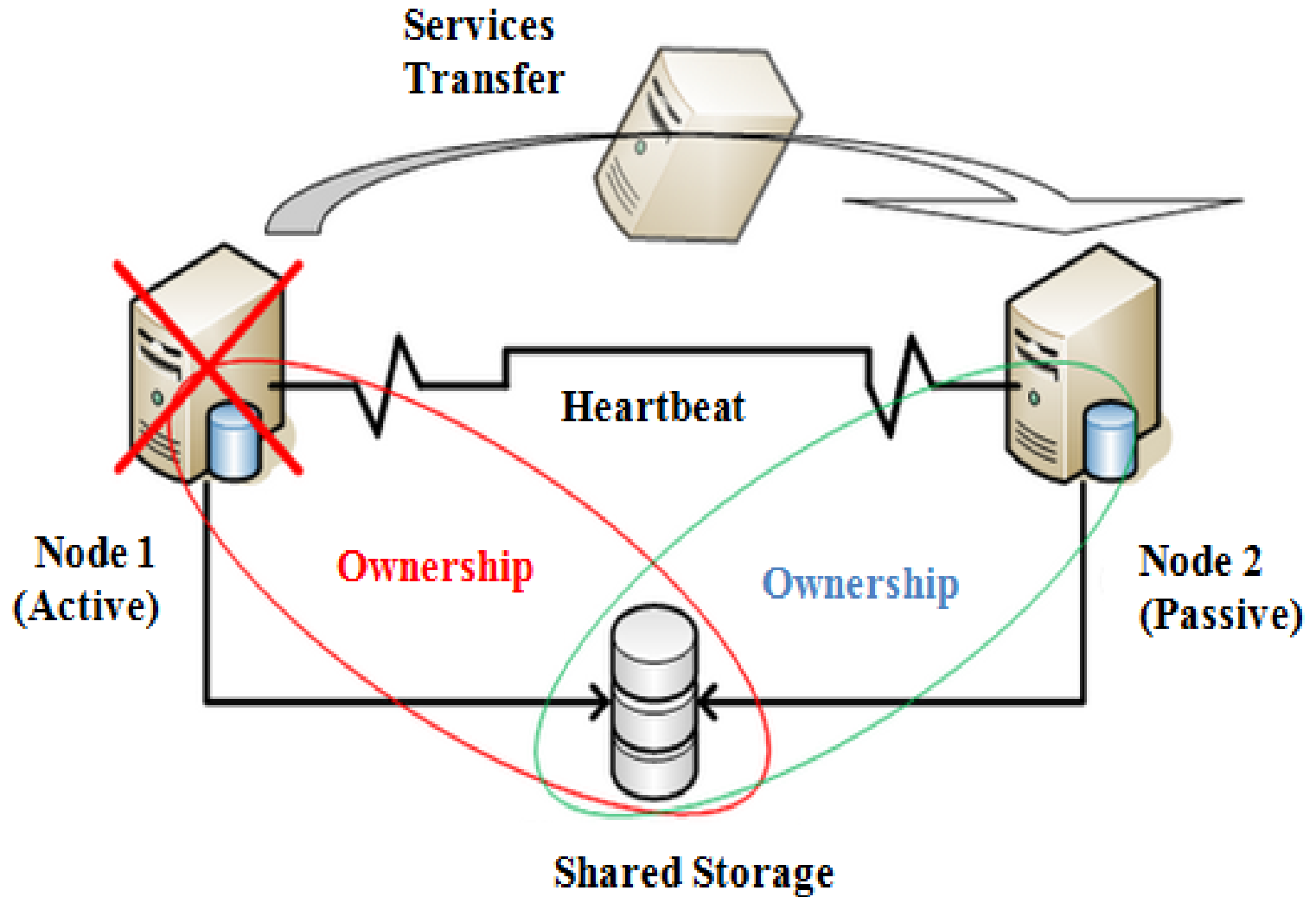
Set up a devicenet network includes two nodes.

- Scanner has Address 0
- Inverter(PowerFlex) is slave with address 4
- Start, Stop motor and increase,decrease motor speed from controller

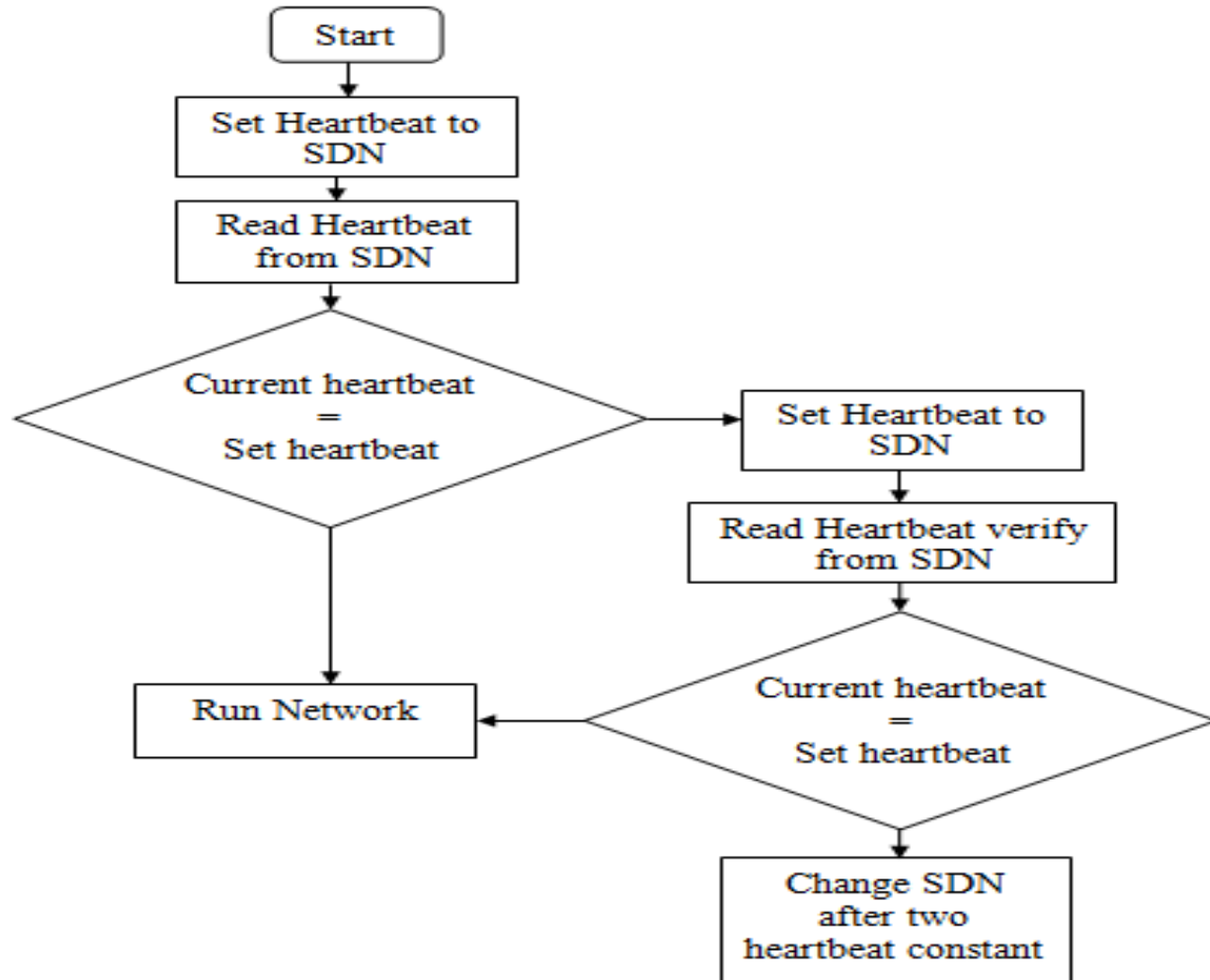
BACK UP ON DEVICENET NETWORK



BACK UP ON DEVICENET NETWORK



BACK UP ON DEVICENET NETWORK



BACK UP ON DEVICENET NETWORK

Configure the Back up system. *Follow these steps to configure a CompactLogix backup system on the DeviceNet network.*

1. Install all I/O and operator interfaces that you need to back up on the DeviceNet network.
2. Connect a CompactLogix controller with a 1769-SDN scanner module to the DeviceNet network.
3. Set the scanner module node address to 0 (*or the lower of the two node addresses reserved for the CompactLogix controller backup system*).
4. Apply power to the controller and the network.
5. Use RSNetWorx for DeviceNet software to download the network's scanlist to the 1769-SDN scanner module
(*You can either use a scanlist from a new configuration or from a previously-used configuration. If the scanlist is a new configuration, we recommend that you save it to a new project for later use*)

BACK UP ON DEVICENET NETWORK

6. Use RSLogix 5000 programming software to download the appropriate user program to the CompactLogix controller
(The program should contain the explicit messages that enable the backup feature for this controller and scanner module: Next section).
7. Put the controller into Run mode.
8. Either disable power to the controller or disconnect the scanner module from the DeviceNet network
(This controller will be the secondary controller)
9. Connect the other CompactLogix controller with a 1769-SDN scanner module on the network.
10. Set the node address to 0
11. Apply power to the controller and scanner module

BACK UP ON DEVICENET NETWORK

12. Use RSNetWorx for DeviceNet software to download the same scanlist used in step 5

(It may be necessary to browse the network again before downloading the scanlist. This second browsing of the network allows RSNetWorx for DeviceNet software to establish communication to the new scanner module at the same node number as the previous scanner)

13. Use RSLogix 5000 programming software to download the user program to the second CompactLogix controller as you did in **step 6**. *(Typically, you download the same user program to the second CompactLogix controller as you did to the first. However, unlike the scanlists, the user programs in the controllers do not have to be identical).*

BACK UP ON DEVICENET NETWORK

14. Put the controller into Run mode.

(This controller is now ready to use and is the primary controller).

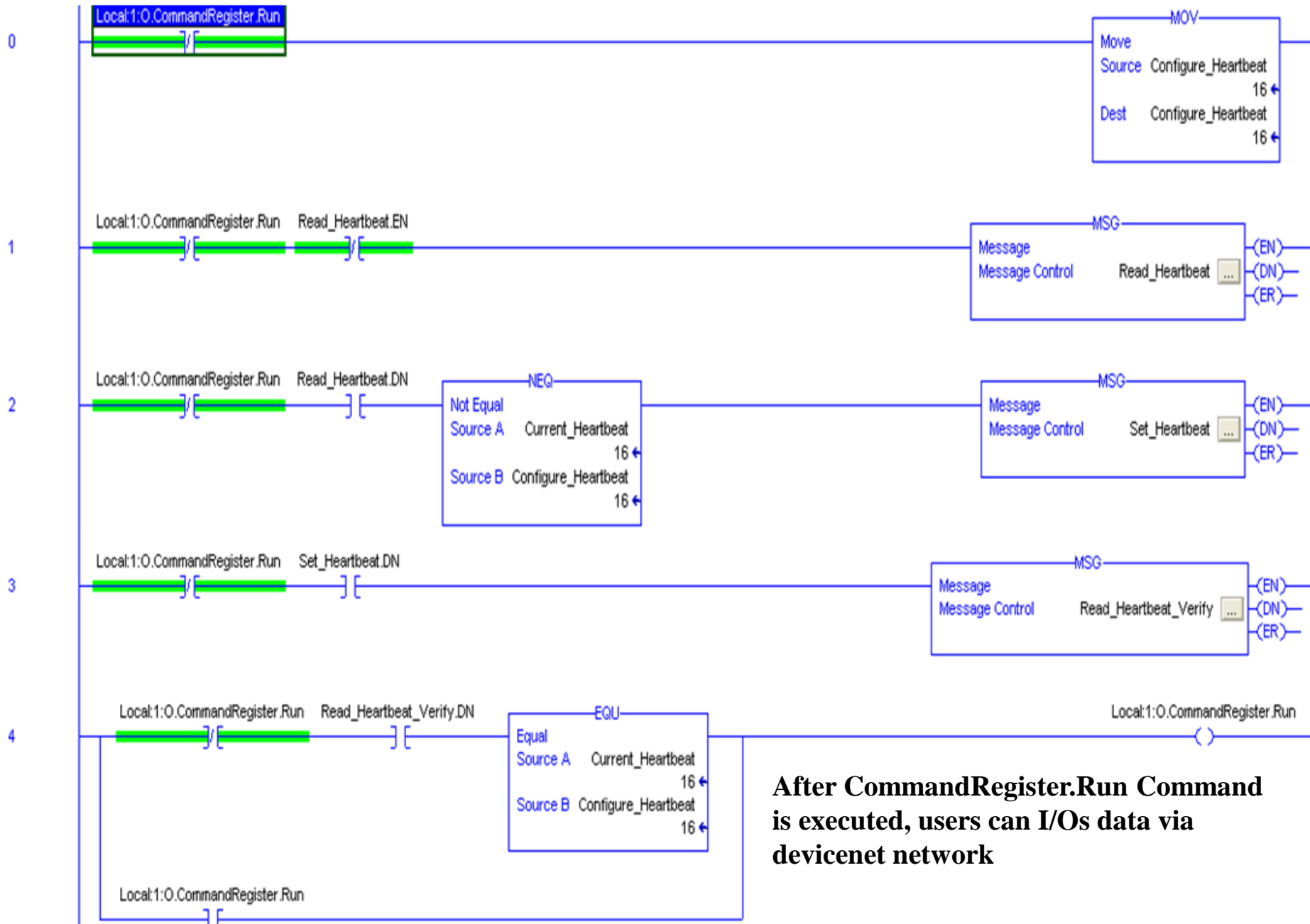
15. Reapply power to the secondary controller and/or reconnect the secondary scanner module to the DeviceNet subnet

CREATING TAGS FOR BACKUP

Scope: Show... Show All

Name	Alias For	Base Tag	Data Type	Style	Description
+Configure_Heartbeat			INT	Decimal	
+Current_Heartbeat			INT	Decimal	
+heartbeat			INT	Decimal	
+Local:1:I			AB:1769_SDN_1...		
+Local:1:O			AB:1769_SDN_3...		
+Read_Heartbeat			MESSAGE		
+Read_Heartbeat_Verify			MESSAGE		
+Set_Heartbeat			MESSAGE		

WIRTING LOGIC FOR BACKUP



After CommandRegister.Run Command is executed, users can I/Os data via devicenet network

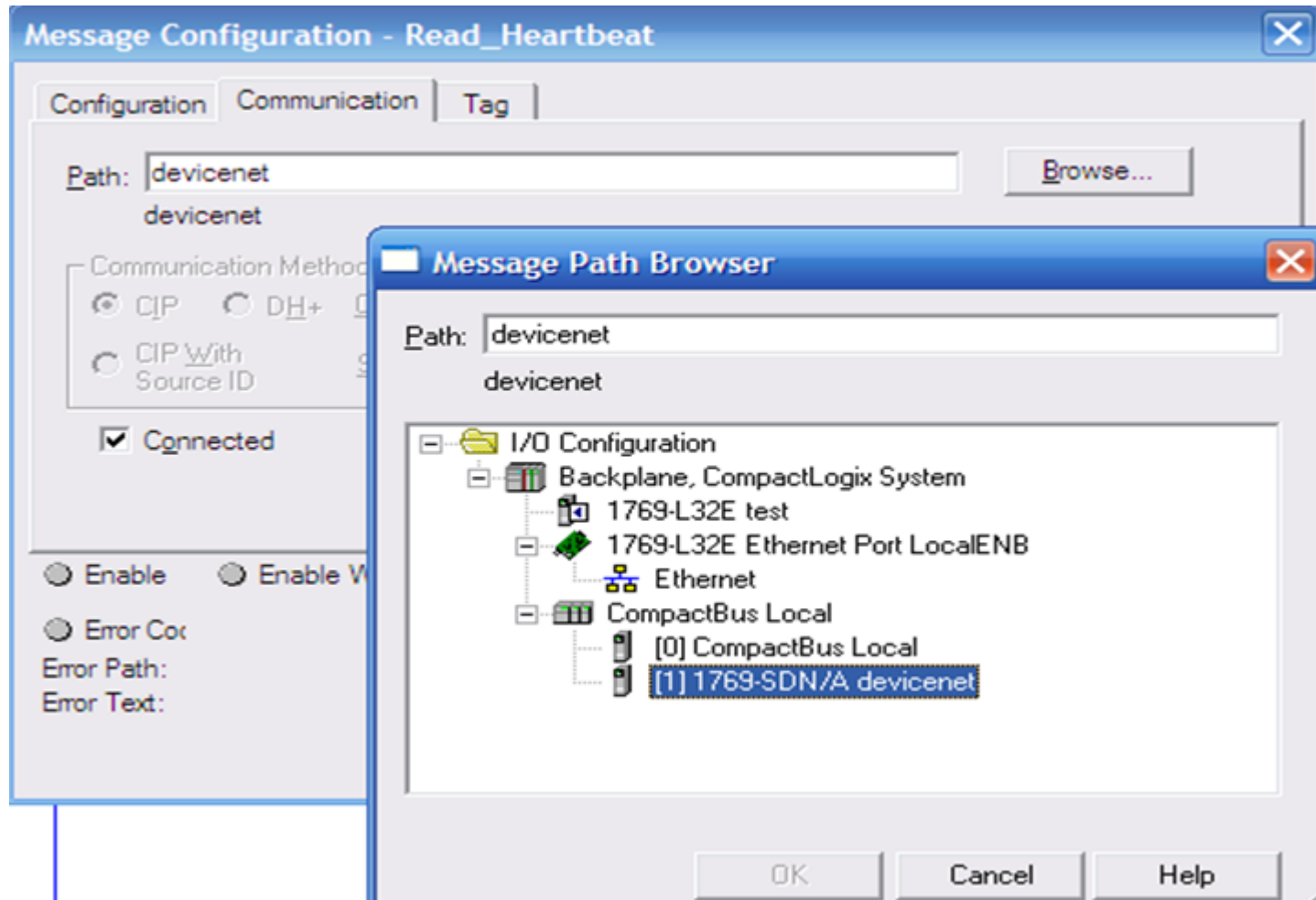
CONFIGURING MSG TO GET HEARBEAT

The image shows a PLC ladder logic diagram and a configuration dialog box. The ladder logic consists of a normally open contact labeled 'Local:1:O.CommandRegister.Run' and a normally closed contact labeled 'Read_Heartbeat.EN'. A green line connects these contacts to a coil labeled 'MSG'. This coil is connected to a 'Message Control' block, which has three outputs: '(EN)', '(DN)', and '(ER)'. The '(EN)' output is connected to a coil labeled 'Read_Heartbeat'.

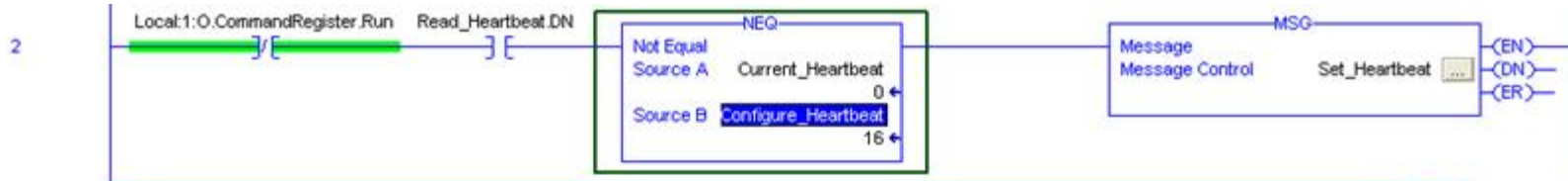
The 'Message Configuration - Read_Heartbeat' dialog box is open, showing the following configuration:

- Configuration | Communication | Tag
- Message Type: CIP Generic
- Service Type: Get Attribute Single
- Service Code: e (Hex)
- Class: 90 (Hex)
- Instance: 1
- Attribute: 12 (Hex)
- Source Element: (empty)
- Source Length: 0 (Bytes)
- Destination: Current_Heartbeat
- Buttons: New Tag...
- Enable: Enable
- Enable Waiting: Enable Waiting
- Start: Start
- Done: Done
- Done Length: 0
- Error Code: Error Code
- Extended Error Code: Extended Error Code
- Timed Out: Timed Out
- Error Path: (empty)
- Error Text: (empty)
- Buttons: OK, Cancel, Apply, Help

SELECTING SDN TO GET HEARTBEAT



CONFIGURING MSG TO SET HEARTBEAT



Message Configuration - Set_Heartbeat

Configuration | Communication | Tag

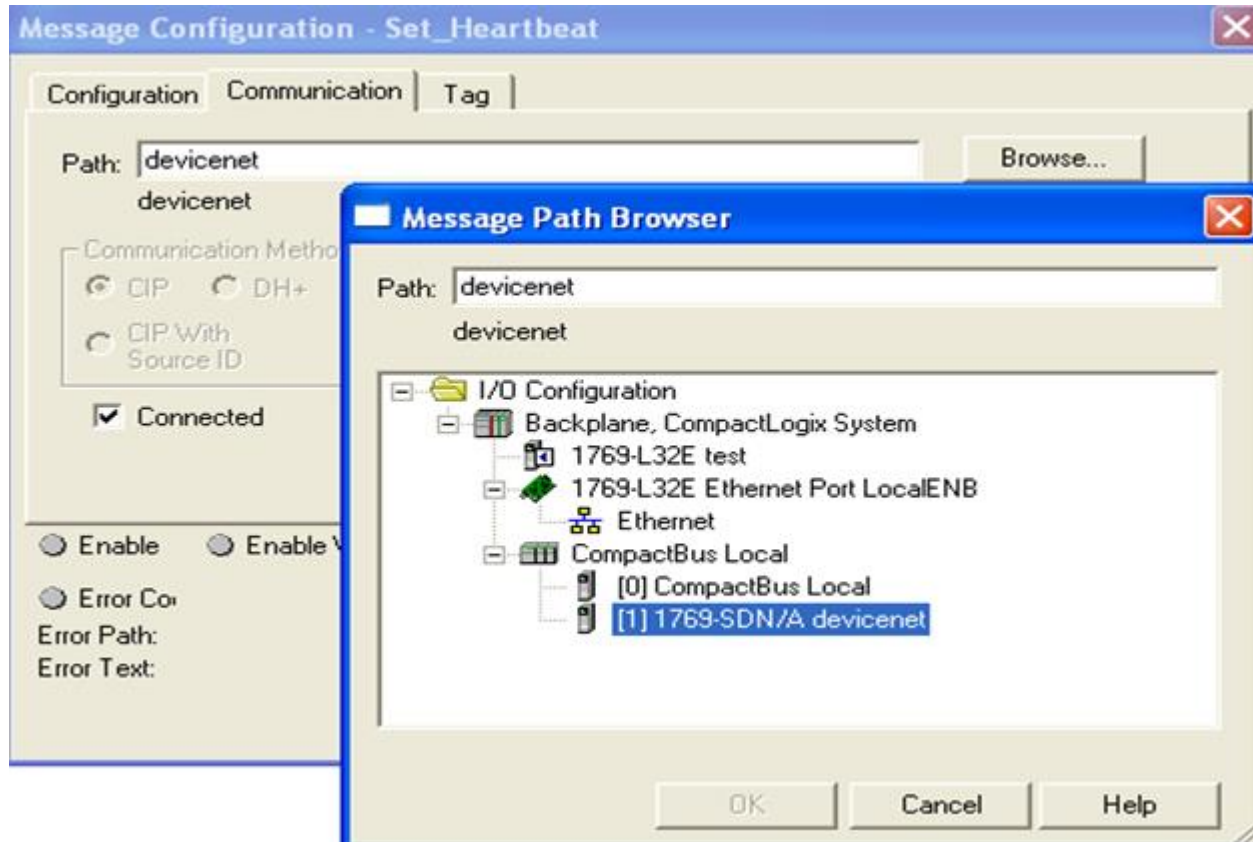
Message Type:

Service Type: Source Element:

Service Code: (Hex) Class: (Hex) Source Length: (Bytes)

Instance: Attribute: (Hex) Destination:

SELECTING SDM TO SET HEARTBEAT



DATA TRANSFER BETWEEN CONTROLLERS

Transfer data via Ethernet network

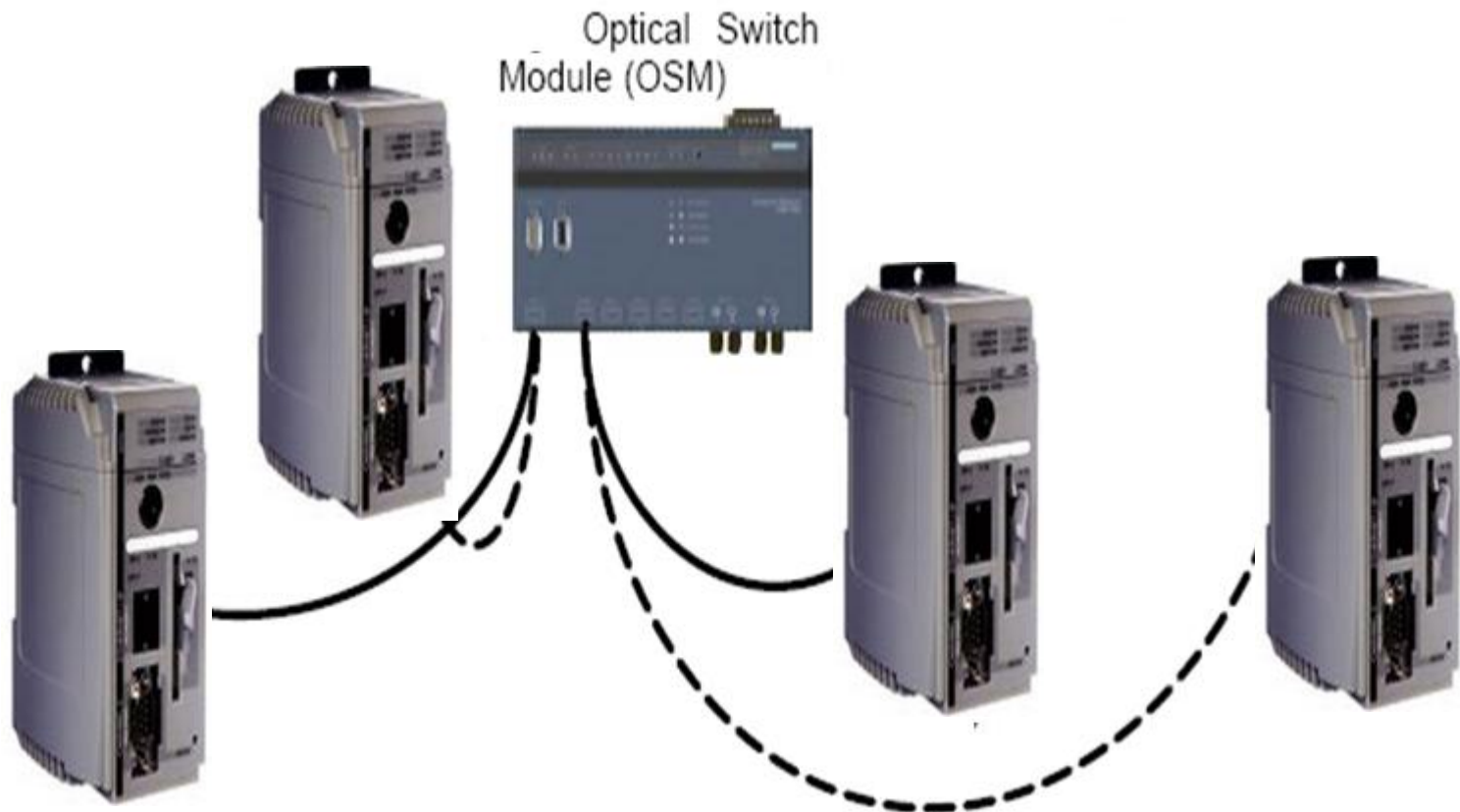
Each device must has a different address

192.168.1.20
255.255.255.0

192.168.1.21
255.255.255.0

192.168.1.24
255.255.255.0

192.168.1.25
255.255.255.0



DATA TRANSFER BETWEEN CONTROLLERS

Transfer data via Ethernet network by produced and consumed tag

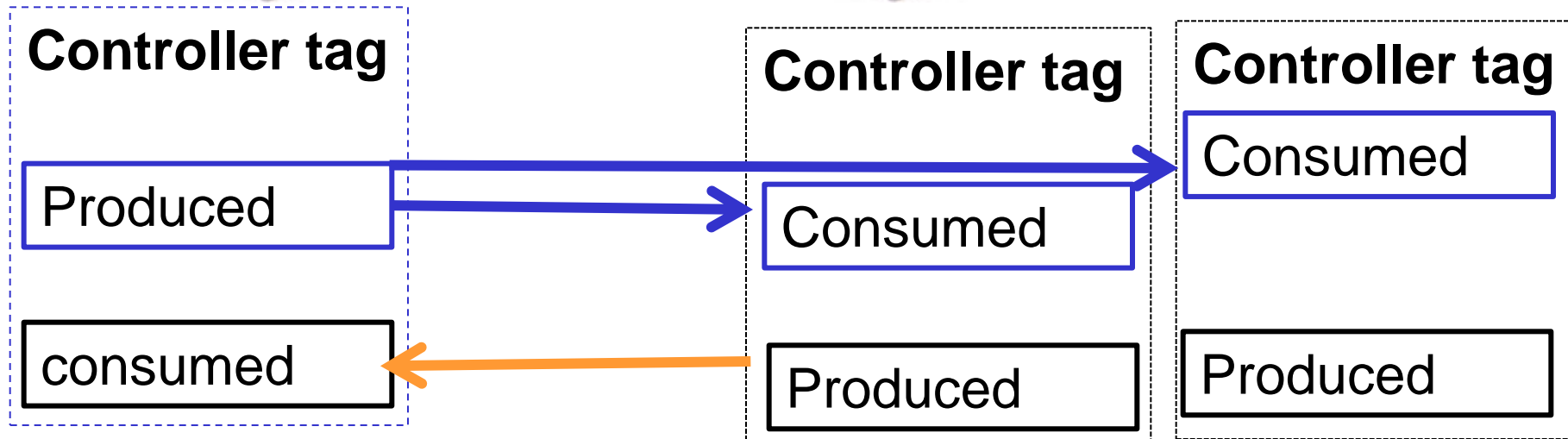
192.168.1.21
255.255.255.0



192.168.1.2
255.255.255.20



192.168.1.4
255.255.255.20



DATA TRANSFER BETWEEN CONTROLLERS

Tag guidelines for Produced and Consumed Data

Guideline	Details
Create the tags at the controller scope.	You can share only controller-scoped tags.
Use one of these data types: <ul style="list-style-type: none">· DINT· REAL· array of DINTs or REALs· user-defined	<ul style="list-style-type: none">• To share other data types, create a user-defined data type that contains the required data.• Use the same data type for the produced tag and corresponding consumed tag or tags.
Limit the size of the tag to ≤ 500 bytes.	<p>If transferring more than 500 bytes, create logic to transfer the data in packets.</p> <p>A size of < 125 DINT words will keep total bytes within 500. This helps reduce the total number of packets for transactions.</p>
Combine data that goes to the same controller.	<p>If producing several tags for the same controller:</p> <ul style="list-style-type: none">• Group the data into one or more user-defined data types. This method uses fewer connections than does producing each tag separately.• Group the data according to similar update intervals. To conserve network bandwidth, use a greater RPI for less critical data. <p>For example, you could create one tag for data that is critical and another tag for data that is not as critical.</p>

DATA TRANSFER BETWEEN CONTROLLERS

Produced and Consumed Tag Definitions

Term	Definition
Produced tag	A tag that a controller makes available for use by other controllers. Multiple controllers can simultaneously consume (receive) the data. A produced tag sends its data to one or more consumed tags (consumers) without using logic. The produced tag sends its data at the RPI of the consuming tag.
Consumed tag	A tag that receives the data of a produced tag. The data type of the consumed tag must match the data type (including any array dimensions) of the produced tag. The RPI of the consumed tag determines the period at which the data updates.

Connections for Produced and Consumed Tags

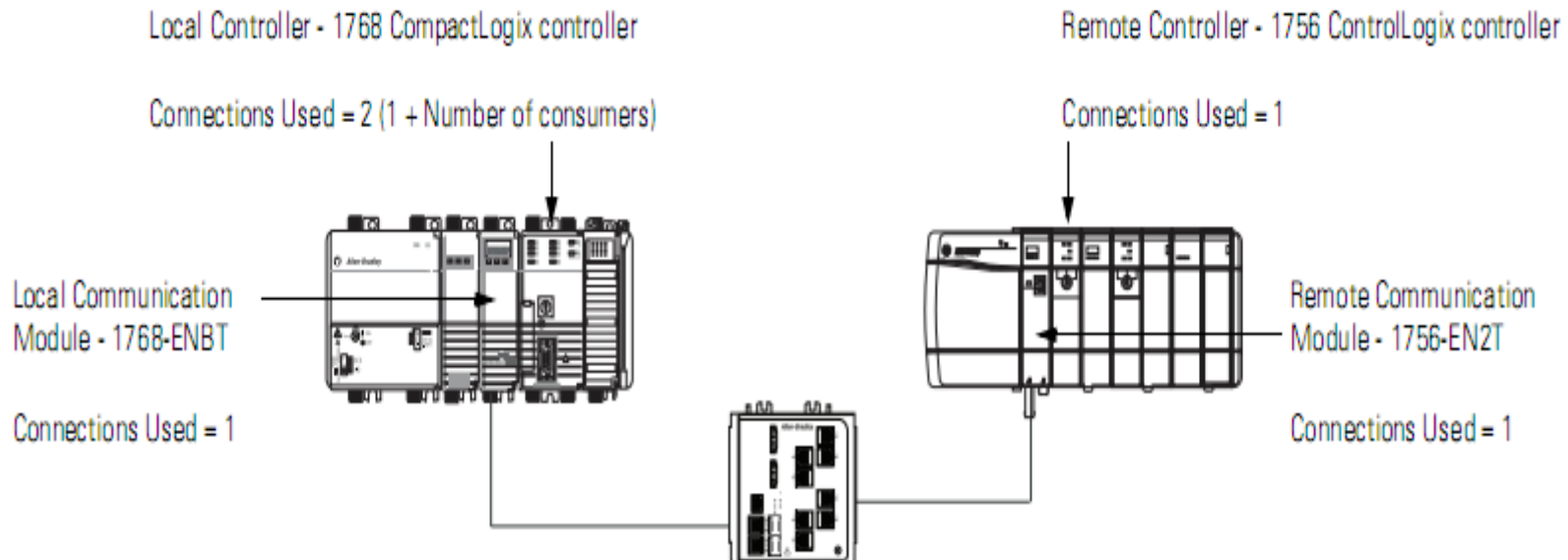
Tag Type	Required Connections
Produced	<p>The local controller (producing) must have one connection for the produced tag and the first consumer and one more connection for each additional consumer (heartbeat). The produced tag requires two connections.</p> <p>As you increase the number of controllers that can consume a produced tag, you also reduce the number of connections the controller has available for other operations, such as communication and I/O.</p>
Consumed	Each consumed tag requires one connection for the controller that is consuming the tag.

DATA TRANSFER BETWEEN CONTROLLERS

Number Connections for Produced and Consumed Tags

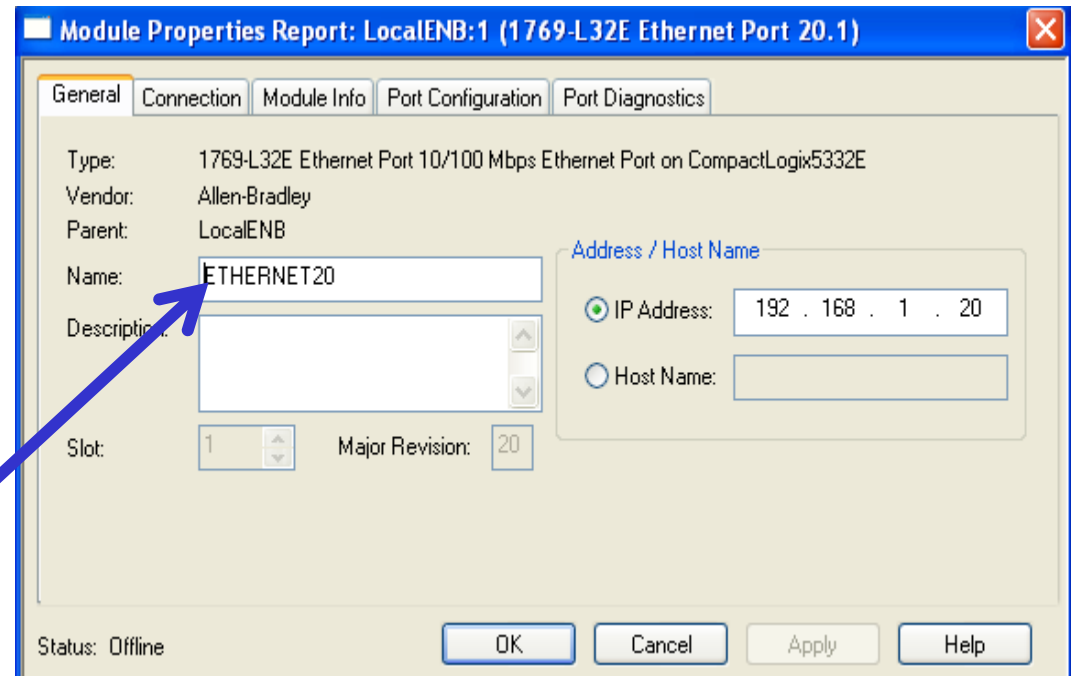
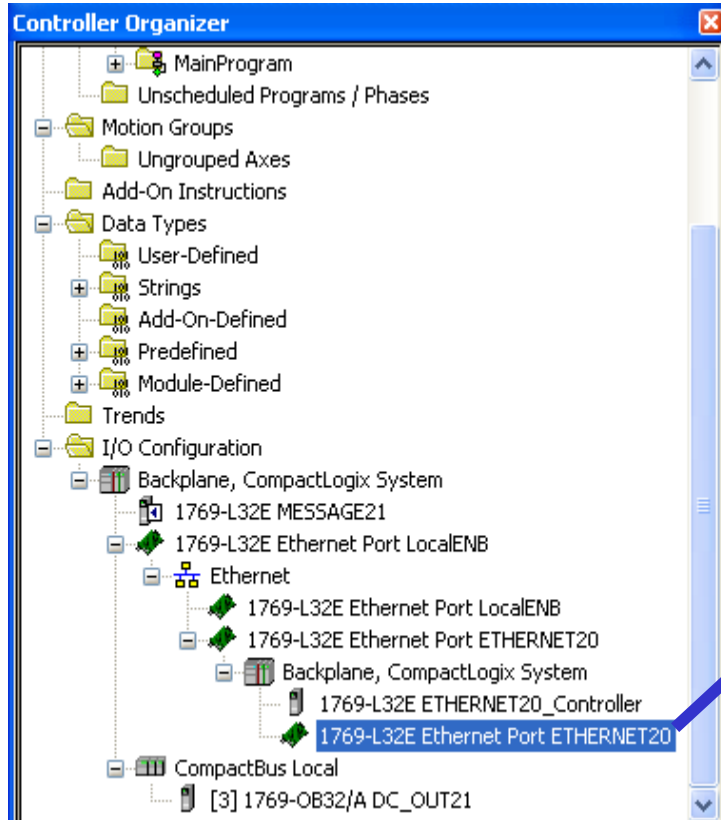
Type of Tag	Device	Number of Connections Used
Produced tag	Logix5000 controller	Number_of_consumers + 1
	EtherNet/IP module	1
Consumed tag	Logix5000 controller	1
	EtherNet/IP module	

Example of Number Connections for Produced and Consumed Tags



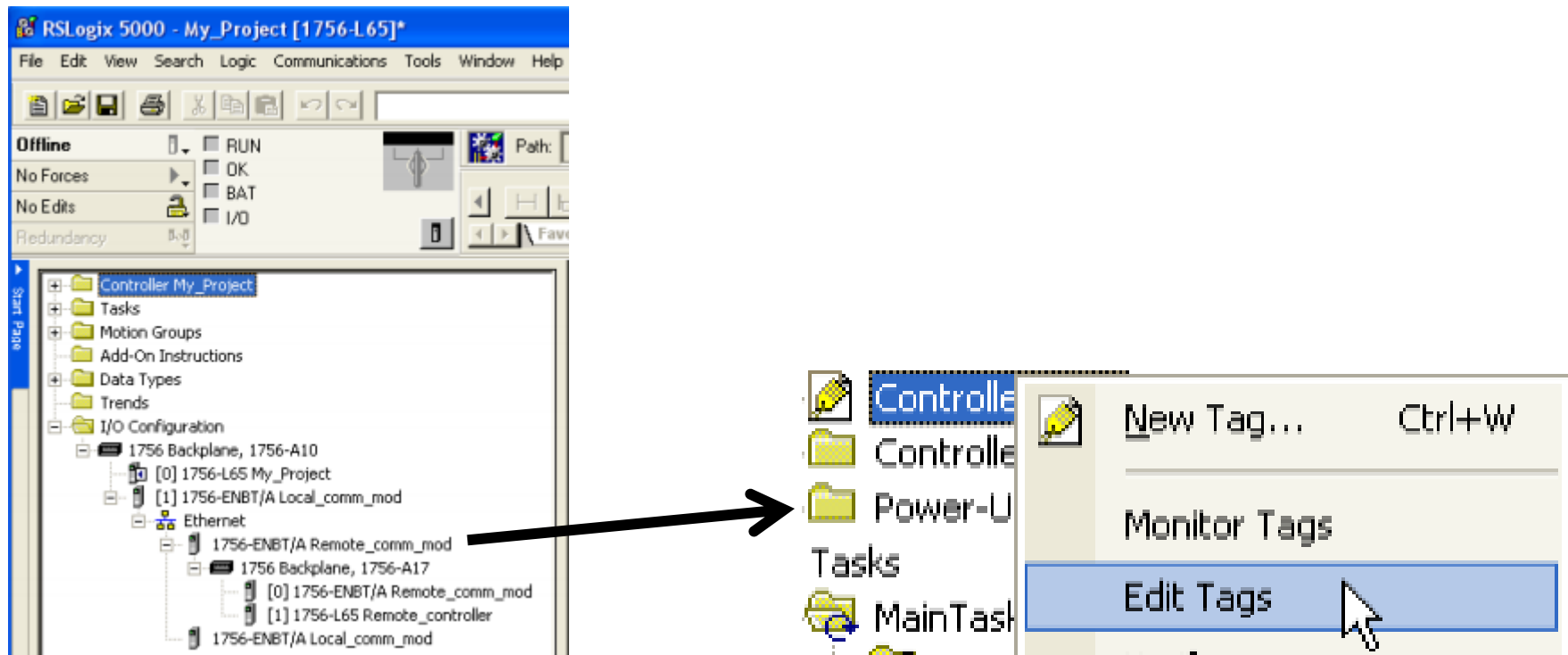
DATA TRANSFER BETWEEN CONTROLLERS

Create and configure a Produced Tag: Add the **consumer controller** via ethernet network then create controller tags



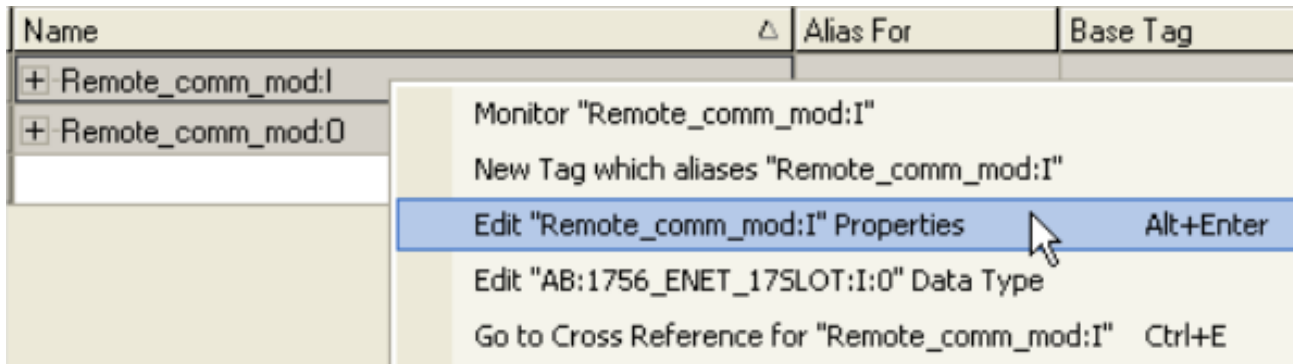
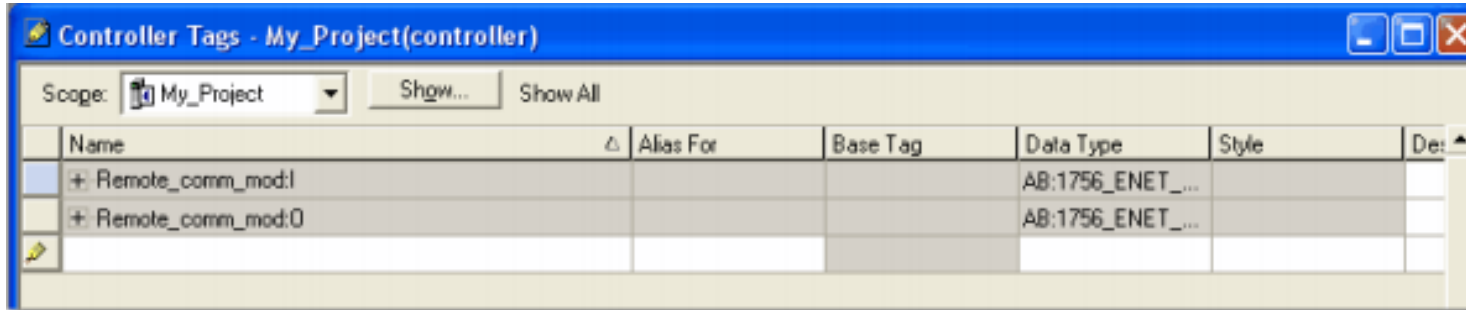
DATA TRANSFER BETWEEN CONTROLLERS

Create and configure a Produced Tag: Add the **consumer controller** via ethernet network then create controller tags



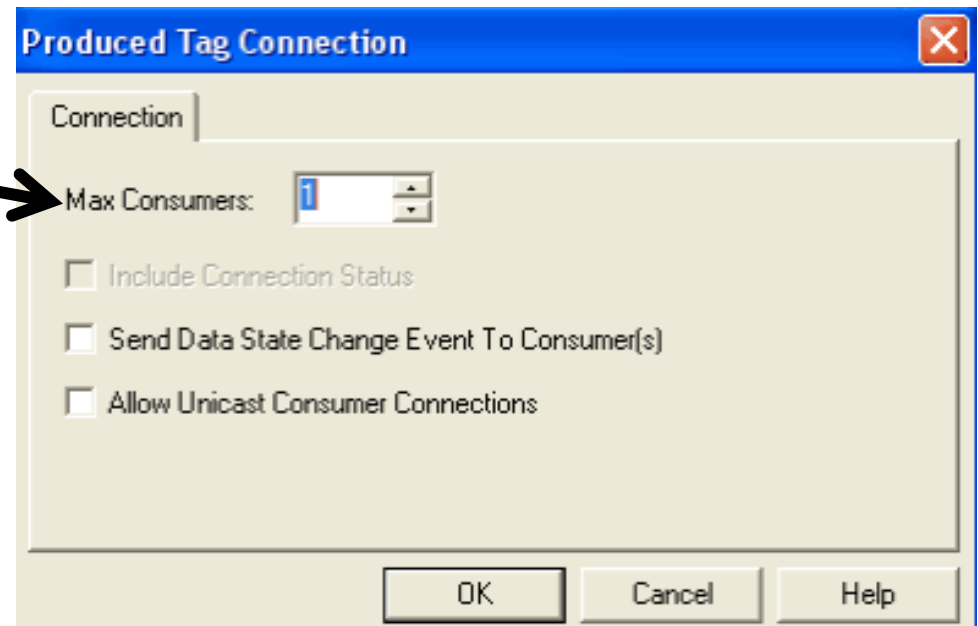
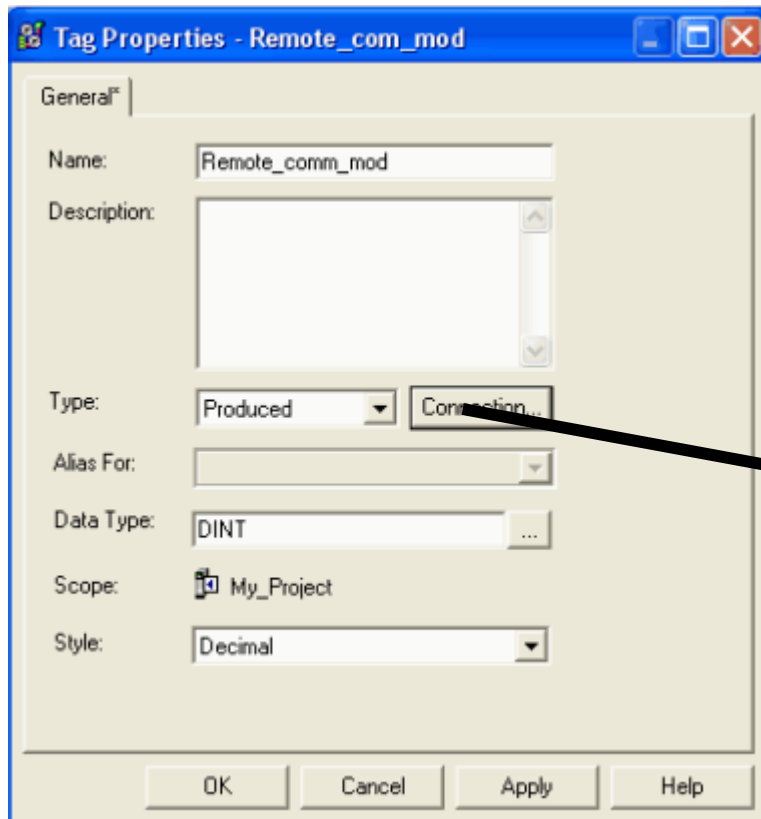
DATA TRANSFER BETWEEN CONTROLLERS

Edit properties of Produced Tags



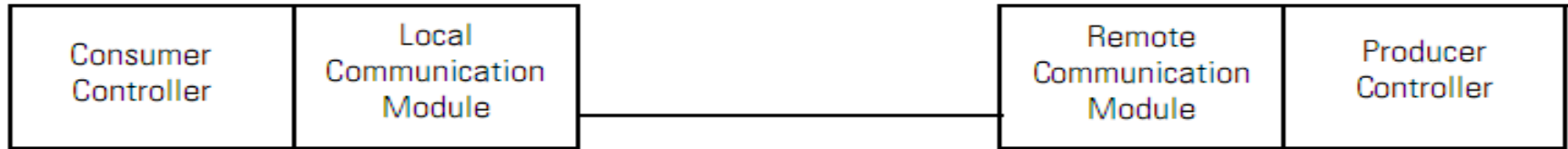
DATA TRANSFER BETWEEN CONTROLLERS

Choose Tag type is **Produced** then choose connection tab to add Max consumers

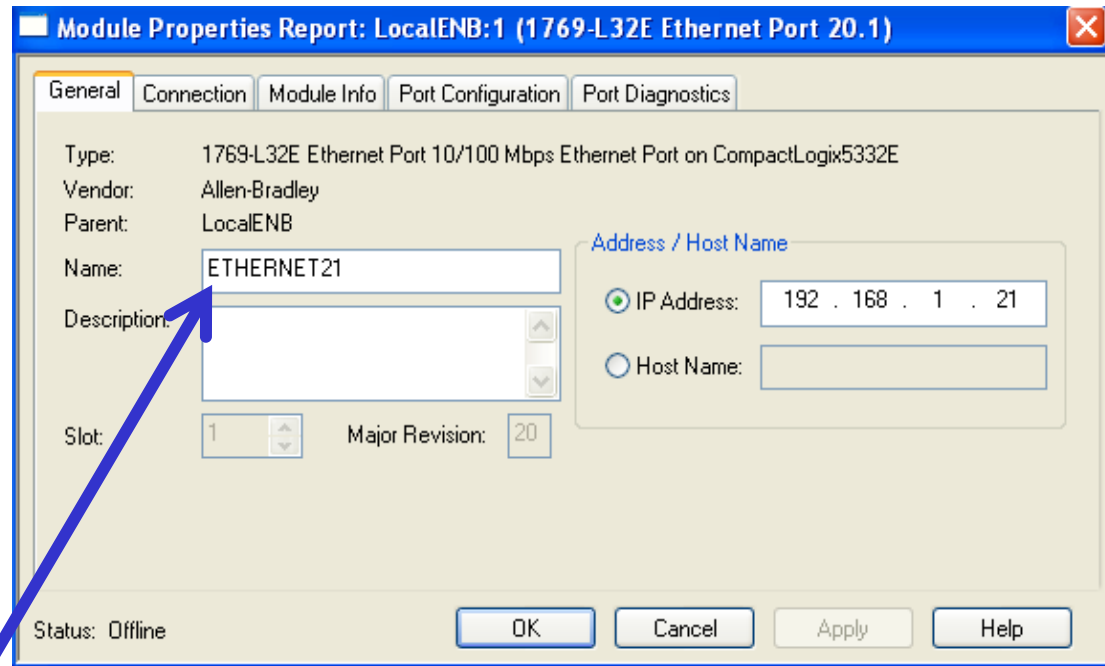
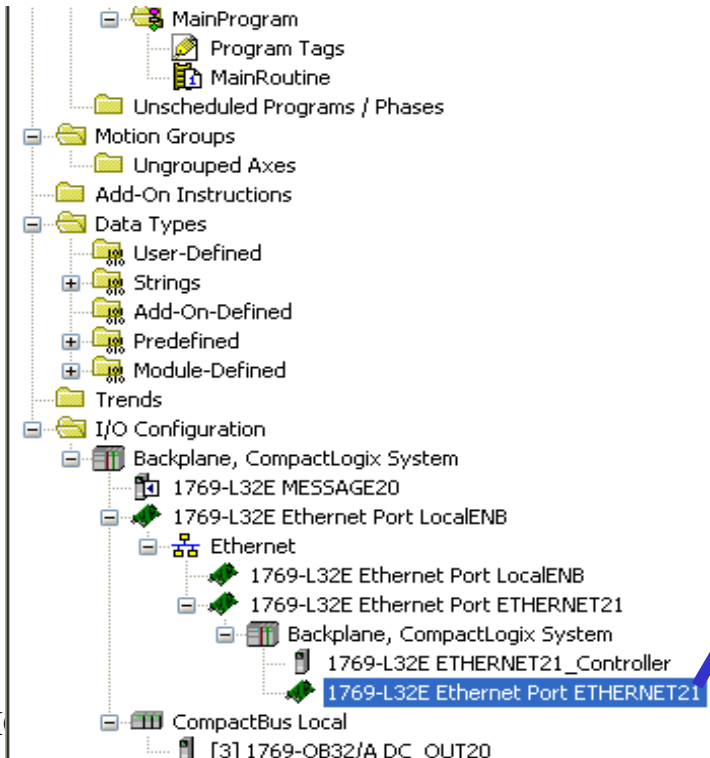


DATA TRANSFER BETWEEN CONTROLLERS

Consumed Tag is produced and configured by another controller

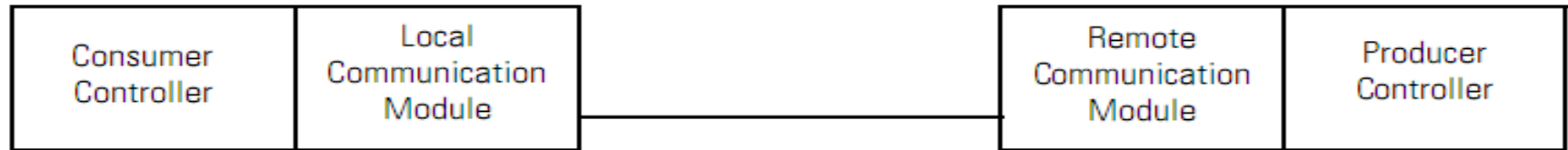


Create and configure a consumed Tag: Add the producer controller via ethernet network then create controller tags

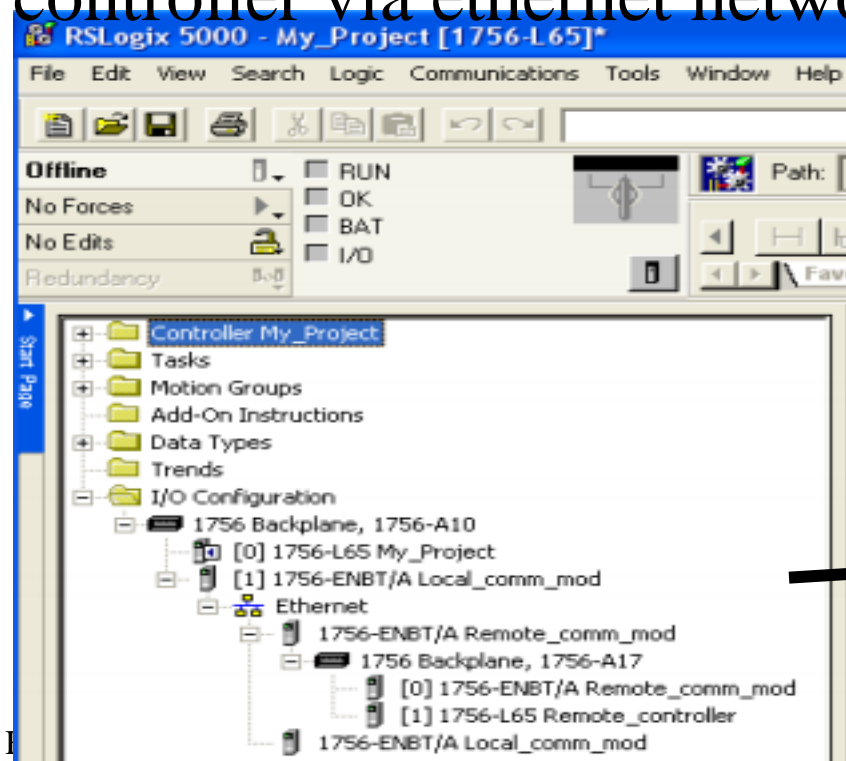


DATA TRANSFER BETWEEN CONTROLLERS

Consumed Tag is produced and configured by another controller

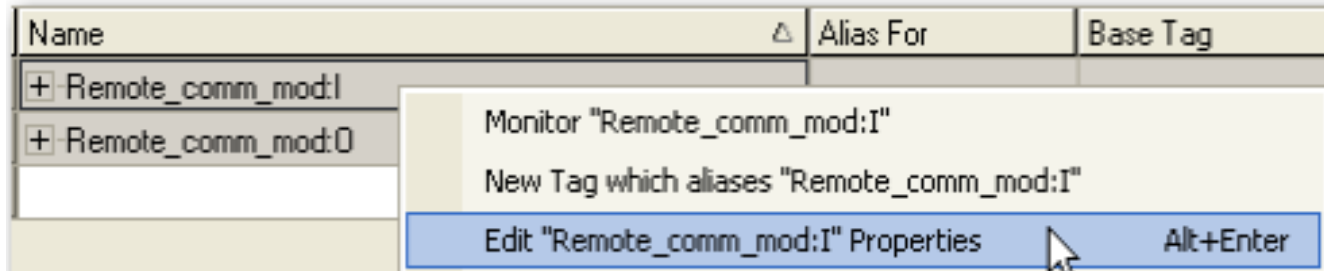


Create and configure a consumed Tag: Add the producer controller via ethernet network then create controller tags

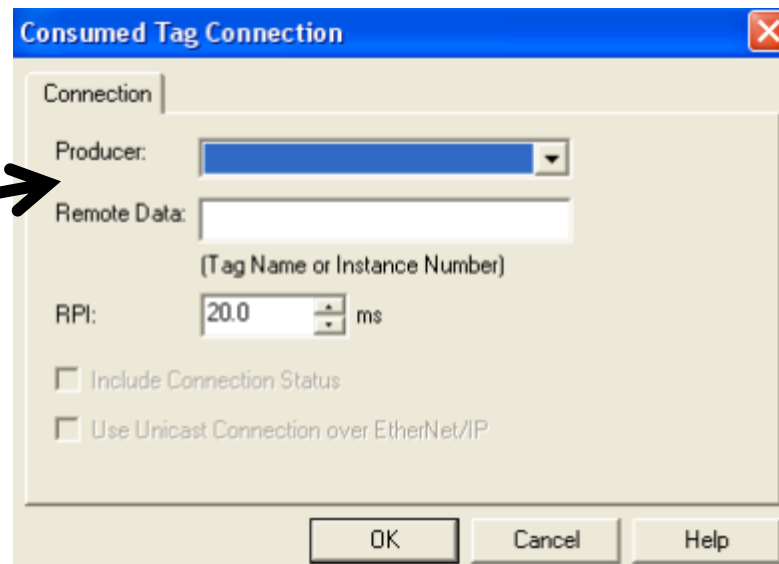
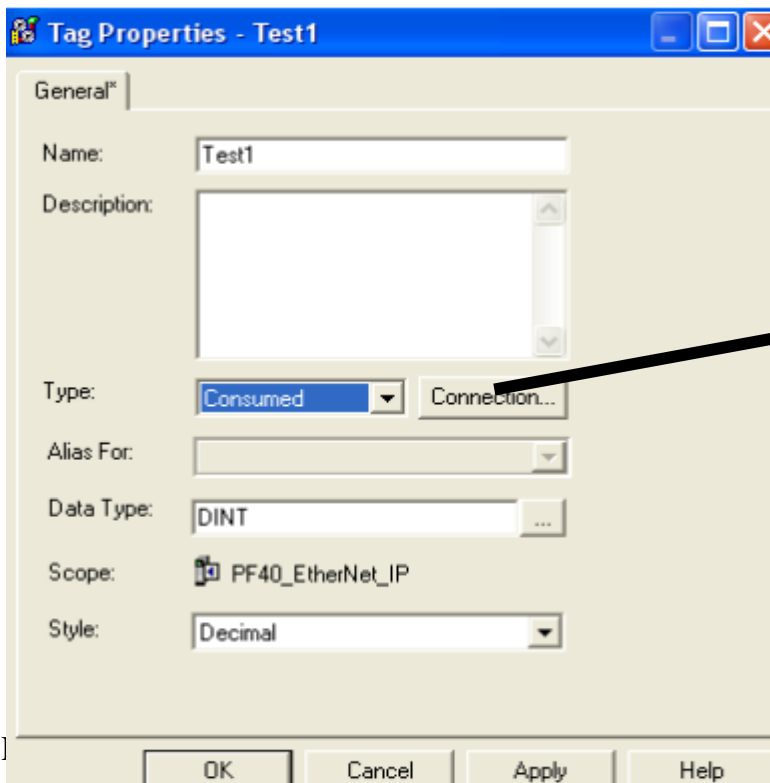


DATA TRANSFER BETWEEN CONTROLLERS

Edit properties of controller tag



Choose Tag type is **consumed** then choose connection tab to connect to producer controllers



DATA TRANSFER BETWEEN CONTROLLERS

Transfer data via Ethernet network by Message control

Ins 192.168.1.21
255.255.255.0



Controller tag
Tag1, tag2..

192.168.1.4
255.255.255.20



Controller tag
Tag1, tag2..

Message control

Data table write

Data table read

Message control

Data table write

Data table read

DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

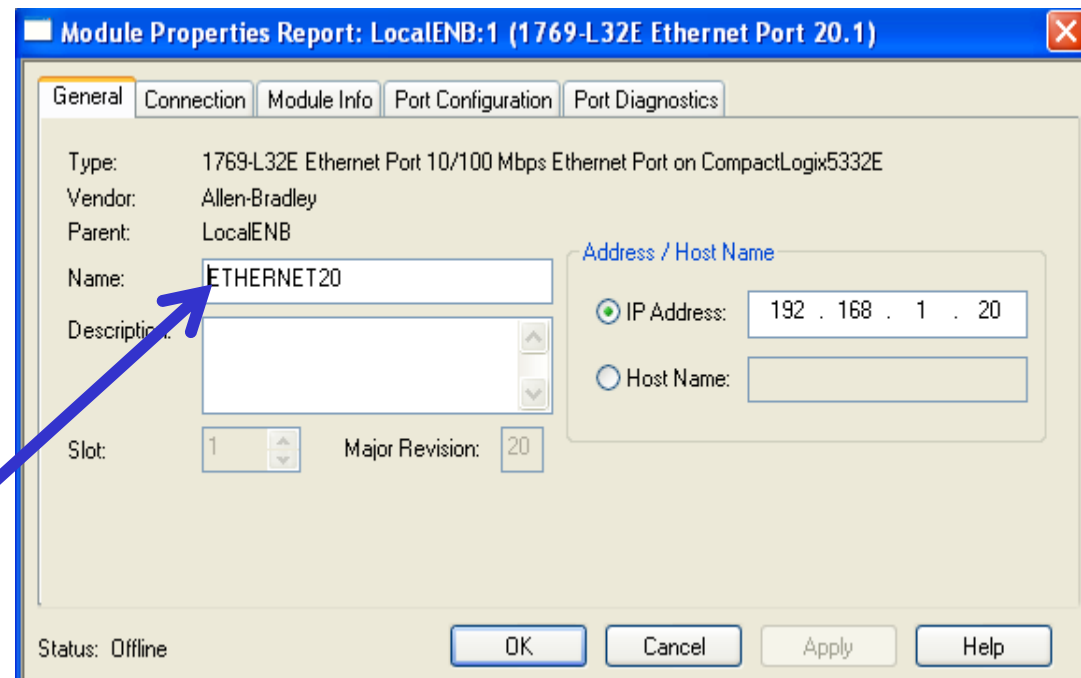
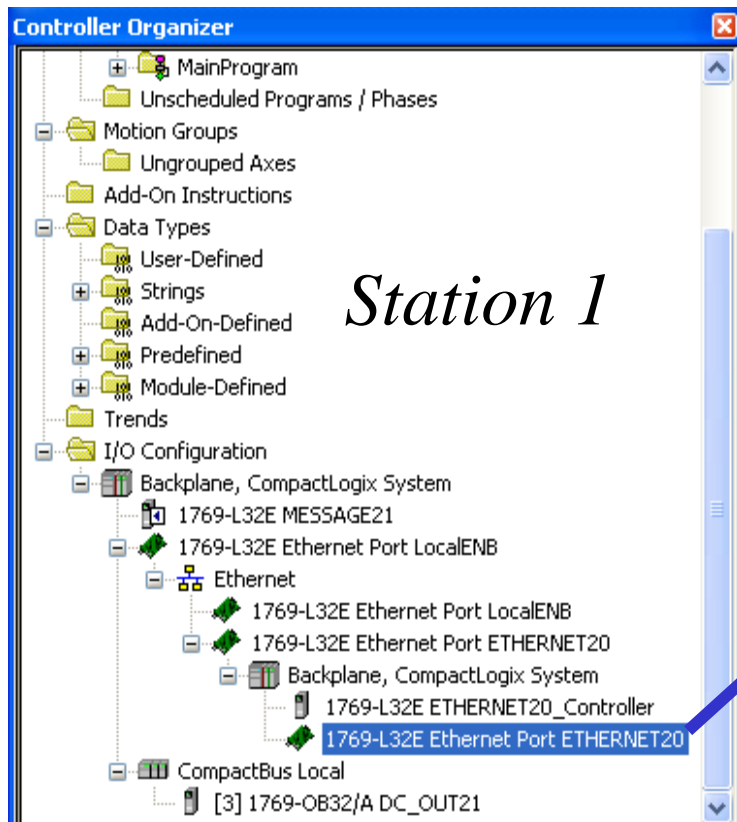


If The Target Device Is a	Select One Of These Message Types
Logix5000 controller	CIP Data Table Read
	CIP Data Table Write
I/O module that you configure using RSLogix 5000 software	Module Reconfigure
	CIP Generic

DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

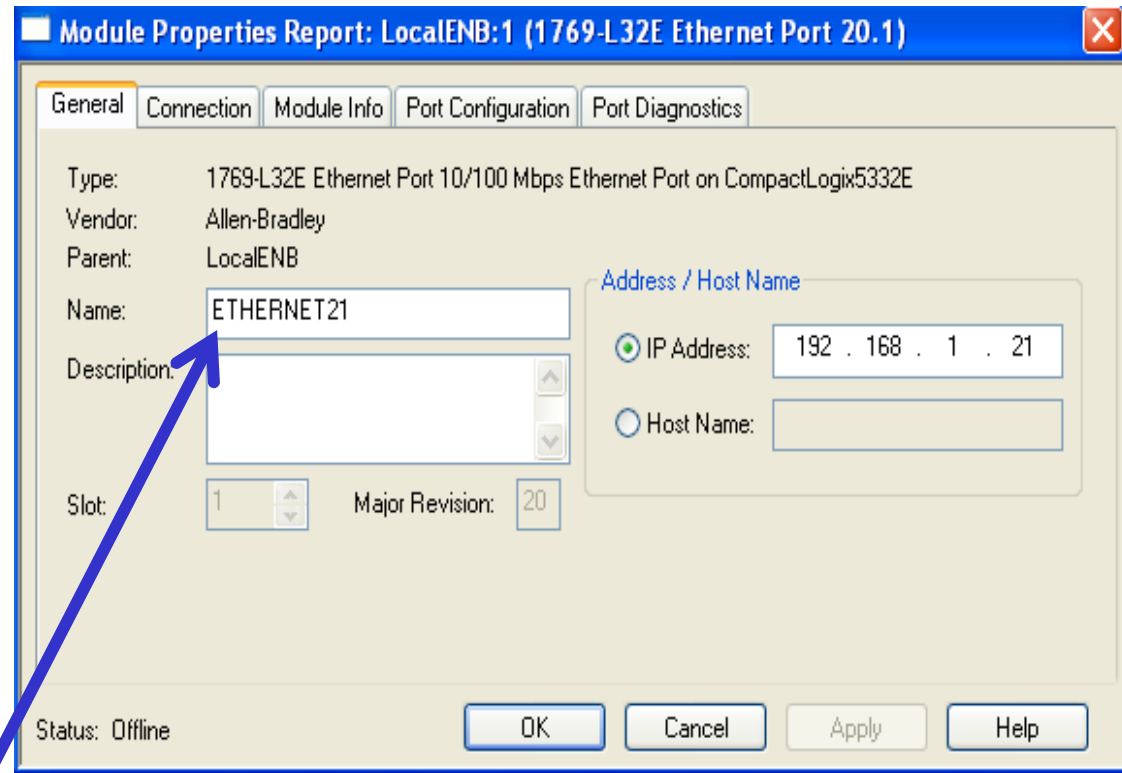
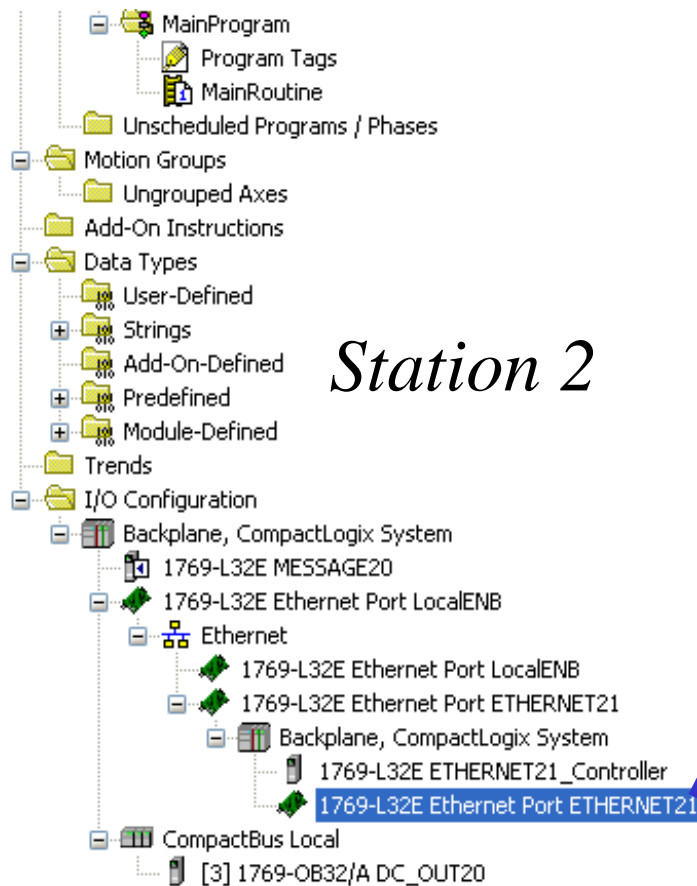
To transfer data, add an Ethernet module and set IP address of remote station in hardware configuration transfer station and vice versa.



DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

add an Ethernet module and set IP address of remote station in hardware configuration transfer station and vice versa.



DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

Create tags in controller tag for each station.

Controller Organizer

Scope: MESSAGE21 Show: All Tags

Name	Alias For	Base Tag	Data Type
+ DATA_SEND21			DINT
+ Local:3:C			AB:1769_D032:C:0
+ Local:3:I			AB:1769_D032:I:0
+ Local:3:O			AB:1769_D032:O:0
+ READ21			DINT[4]
+ DATA21			MESSAGE

Controller Organizer

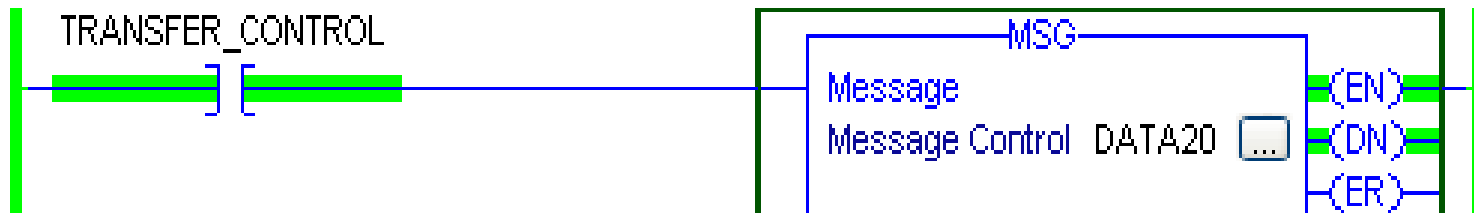
Scope: MESSAGE20 Show: All Tags

Name	Alias For	Base Tag	Data Type	Description
+ Local:3:C			AB:1769_D032:C:0	
+ Local:3:I			AB:1769_D032:I:0	
+ Local:3:O			AB:1769_D032:O:0	
+ DATA_SEND20			DINT[4]	
+ READ20			DINT[4]	
+ DATA20			MESSAGE	

DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

Add and configure parameters for Message control Ins (only for one station)



0

(End)

Message Configuration - DATA20

Configuration Communication Tag

Message Type: CIP Data Table Write

Source Element: DATA_SEND20 New Tag...

Number Of Elements: 4

Destination Element: READ21

DATA TRANSFER BETWEEN CONTROLLERS

Use Message instruction to read, write data

Add and configure parameters for Message control Ins

The image shows a software interface for configuring data transfer between controllers. The main window is titled "Message Configuration - DATA20" and has three tabs: "Configuration", "Communication", and "Tag". The "Communication" tab is selected. In this tab, the "Path:" field is set to "ETHERNET21_Controller" and has a "Browse..." button next to it. Below the path field, there are radio buttons for "Broad", "Commu", "CIP", "CIP", and "Sou", with "Commu" selected. There are also checkboxes for "Enable" (checked), "Error Co", "Error Path:", and "Error Text:". A "Message Path Browser" dialog box is overlaid on the main window. It has a title bar "Message Path Browser" and a "Path:" field also set to "ETHERNET21_Controller". The browser shows a tree view of the system configuration. The tree starts with "I/O Configuration", which contains "Backplane, CompactLogix System". Under this, there are several items: "1769-L32E MESSAGE20", "1769-L32E Ethernet Port LocalENB", "Ethernet", "1769-L32E Ethernet Port LocalENB", "1769-L32E Ethernet Port ETHERNET21", "Backplane, CompactLogix System", "1769-L32E ETHERNET21_Controller" (highlighted in blue), and "1769-L32E Ethernet Port ETHERNET21".

DATA TRANSFER BETWEEN CONTROLLERS

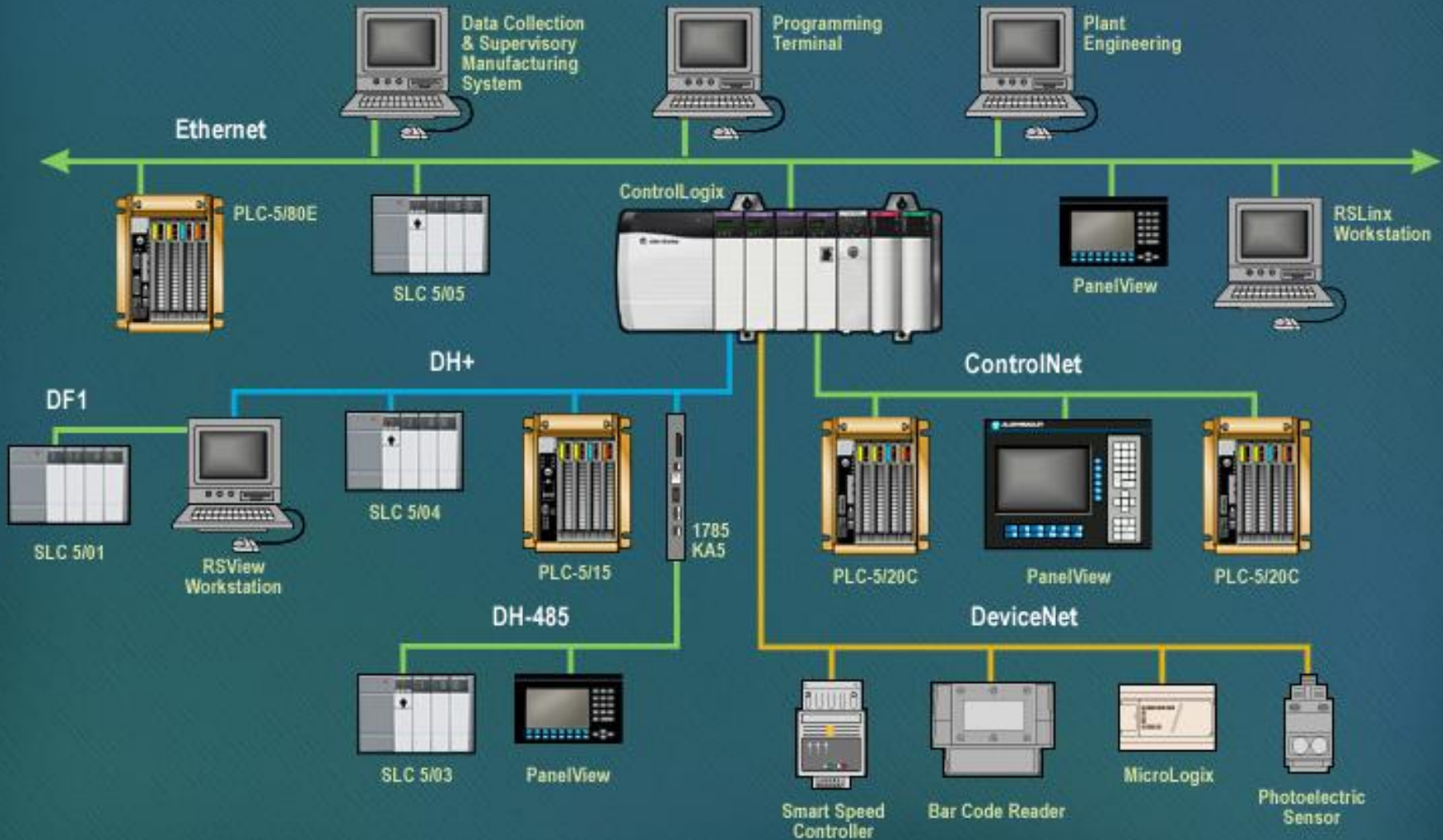
Use Message instruction to read, write data

Download program to plc and check respondent of data

The screenshot displays a PLC software interface. At the top, there are status indicators for 'Rem Run', 'No Forces', and 'No Edits'. To the right, a path is shown as 'AB_ETHIP-1\192.168.1.20\Backplane\0*'. Below this, there are navigation buttons for 'Bit', 'Timer/Counter', 'Input/Output', 'Compare', and 'Compute'. The 'Controller Organizer' window on the left shows a tree structure with folders like 'Controller MESSAGE20', 'Tasks', 'MainTask', and 'MainProgram'. The main window displays a table of tags for the selected scope 'MESSAGE20'.

Name	Value	Force Mask	Style
+ Local:3:C	{...}	{...}	
+ Local:3:I	{...}	{...}	
+ Local:3:O	{...}	{...}	
- DATA_SEND20	{...}	{...}	Decimal
+ DATA_SEND20[0]	0		Decimal
+ DATA_SEND20[1]	0		Decimal
+ DATA_SEND20[2]	0		Decimal
+ DATA_SEND20[3]	255		Decimal
+ READ20	{...}	{...}	Decimal
+ DATA20	{...}	{...}	
TRANSFER_CONTROL	1		Decimal

CONTROLNET OVERVIEW



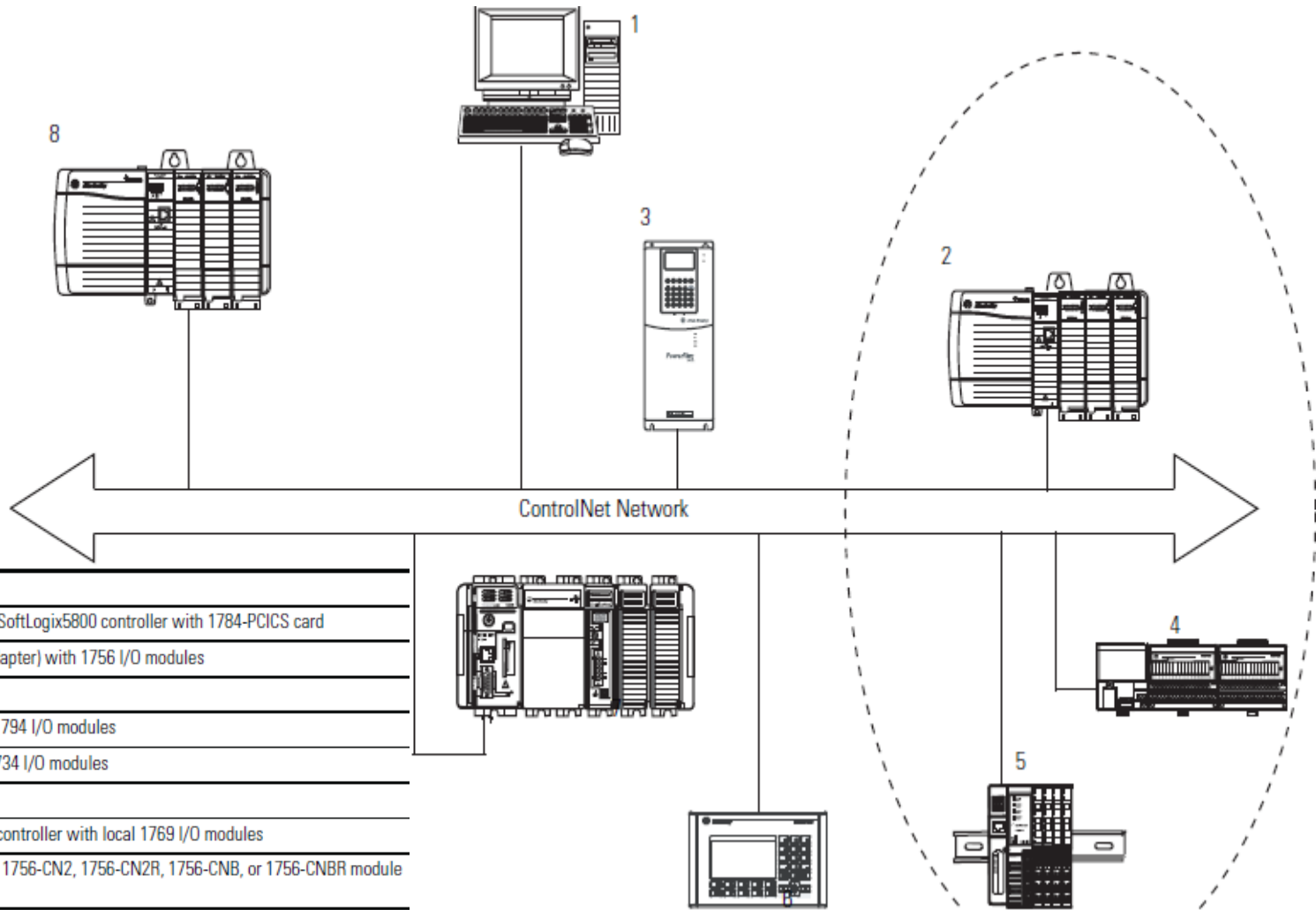
CONTROLNET OVERVIEW

The ControlNet network provides high-speed transmission of **time-critical I/O** and **interlocking data** and **messaging data**.

The ControlNet network is most often used in these ways:

- As the default network for the ControlLogix platform
- As a backbone to multiple distributed DeviceNet networks
- As a peer interlocking network

Use ControlNet Communication Modules in a Control System



Item	Description
1	Personal computer running SoftLogix5800 controller with 1784-PCICS card
2	1756-CNB module (as an adapter) with 1756 I/O modules
3	PowerFlex 700S drive
4	1794-ACN15 adapter with 1794 I/O modules
5	1734-ACNR adapter with 1734 I/O modules
6	PanelView terminal
7	CompactLogix 1769-L35CR controller with local 1769 I/O modules
8	ControlLogix controller with 1756-CN2, 1756-CN2R, 1756-CNB, or 1756-CNBR module as the scanner

Use ControlNet Communication Modules in a Control System

- The controllers produce and consume tags among themselves.
- The controllers initiate MSG instructions that send/receive data or configure devices.
- The computer uploads and downloads projects to the controllers.
- The computer configures devices on the ControlNet network and configures the network itself.

Exchange Information on a ControlNet Network

- With unscheduled data, the device from which a message originates, such as a Logix5000 controller, contains the path information that makes sure the message reaches its consumers
- Scheduled data in Logix-based systems use the producer/consumer networking model
- The controller can also produce data for other controllers to consume.
- Digital input modules produce (multicast) their data either upon a change of state (COS) or periodically

Control I/O Via ControlNet Network

- With unscheduled data, the device from which a message originates, such as a Logix5000 controller, contains the path information that makes sure the message reaches its consumers
- Scheduled data in Logix-based systems use the producer/consumer networking model
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- Digital input modules produce (multicast) their data either upon a change of state (COS) or periodically

CONTROLNET MODULES

1756-CNB



1756-CNBR



Select Module

Module	Description	Vendor
1756-CN2/A	1756 ControlNet Bridge	Allen-Bra
1756-CN2/B	1756 ControlNet Bridge	Allen-Bra
1756-CN2R/A	1756 ControlNet Bridge	Allen-Bra
1756-CN2R/B	1756 ControlNet Bridge	Allen-Bra
1756-CNB/A	1756 ControlNet Bridge	Allen-Bra
1756-CNB/B	1756 ControlNet Bridge	Allen-Bra
1756-CNB/D	1756 ControlNet Bridge	Allen-Bra
1756-CNB/E	1756 ControlNet Bridge	Allen-Bra
1756-CNBR/A	1756 ControlNet Bridge, Redundant Media	Allen-Bra
1756-CNBR/B	1756 ControlNet Bridge, Redundant Media	Allen-Bra
1756-CNBR/D	1756 ControlNet Bridge, Redundant Media	Allen-Bra
1756-CNBR/E	1756 ControlNet Bridge, Redundant Media	Allen-Bra
1756-DHRIO/B	1756 DH+ Bridge/RIO Scanner	Allen-Bra

Find... Add Favorite

By Category By Vendor Favorites

OK Cancel Help

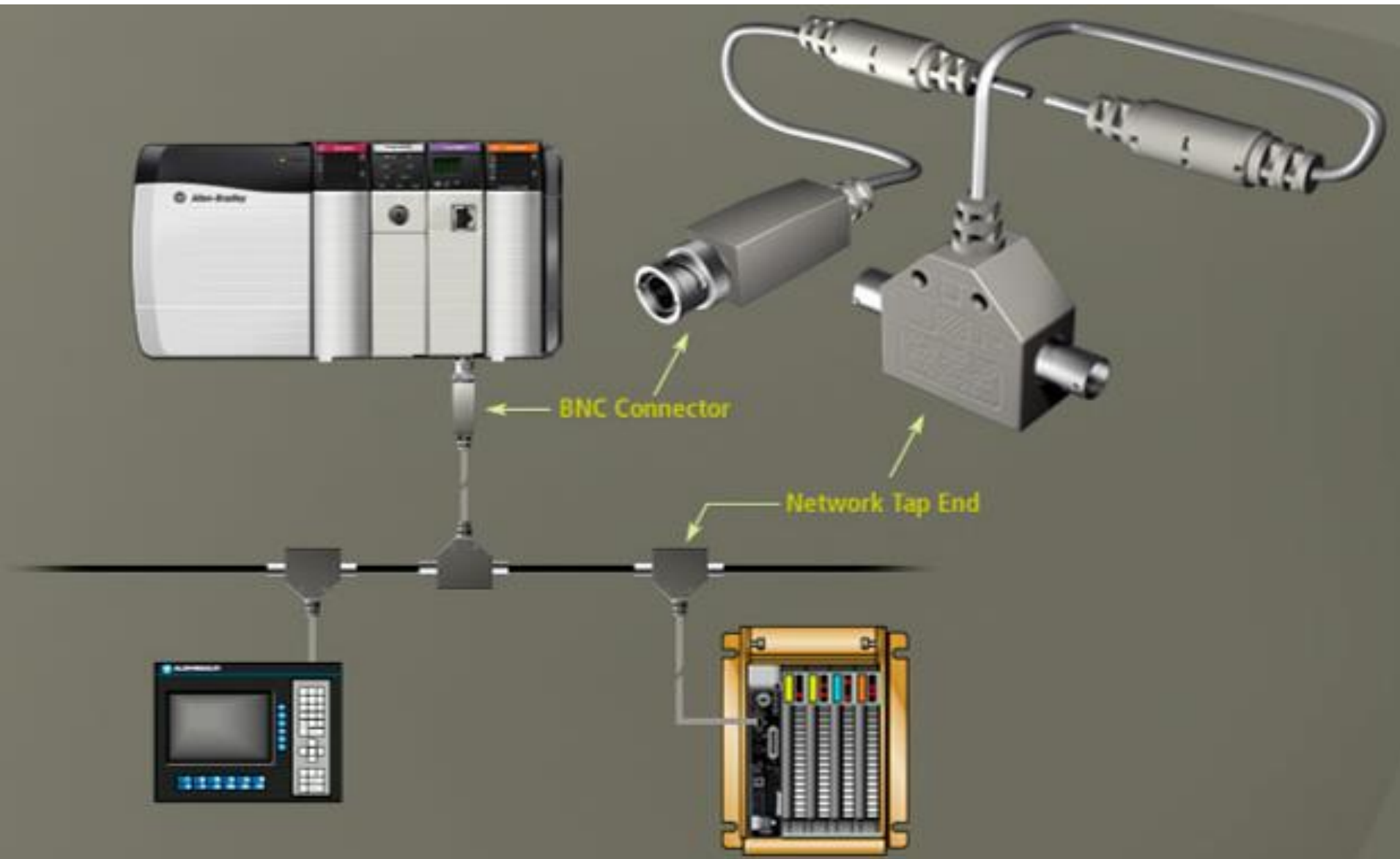
INSTALLING CONTROLNET MODULES



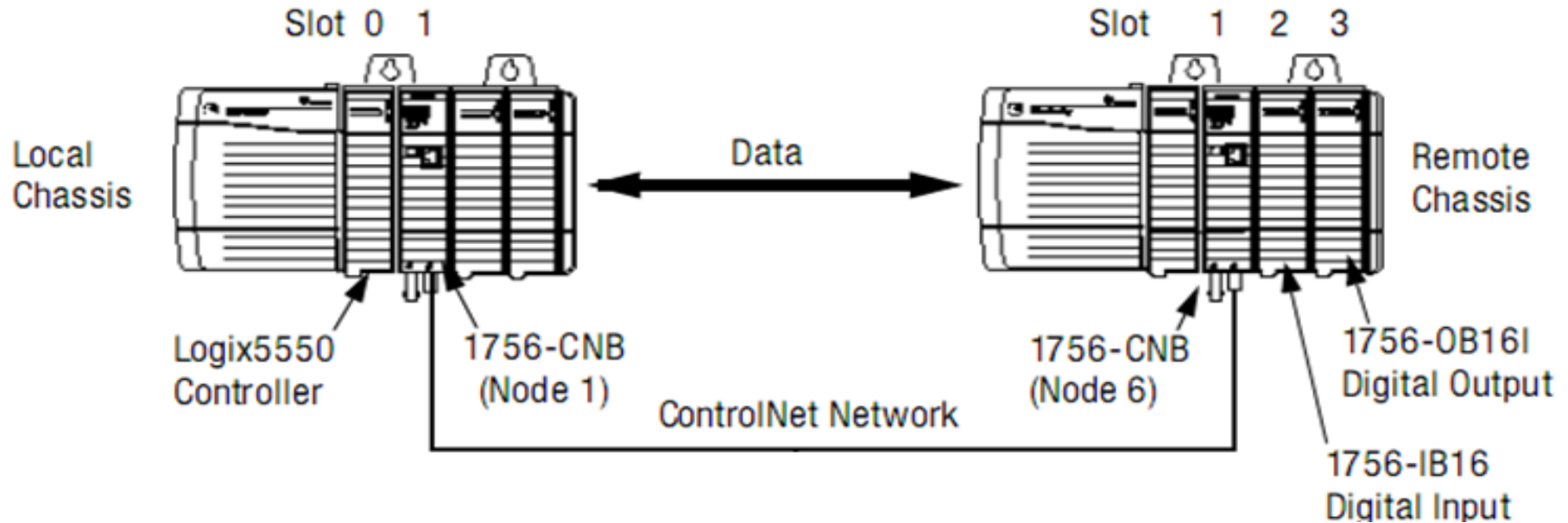
SETTING MODULE ADDRESS



CONTROLNET CABLE



Control I/O Via ControlNet Network



When configure a remote ControlNet communication module or an I/O module, connection format must be choosen. There are two type of communication format **Direct or Rack-optimized connection**

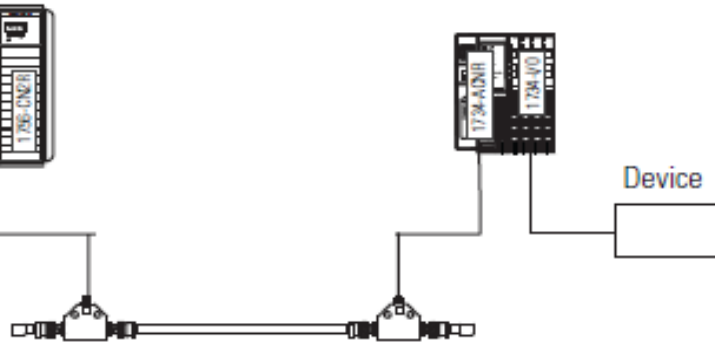
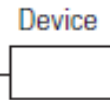
Control I/O Via ControlNet Network

Add Distributed I/O

Controller and Local
Communication Modules

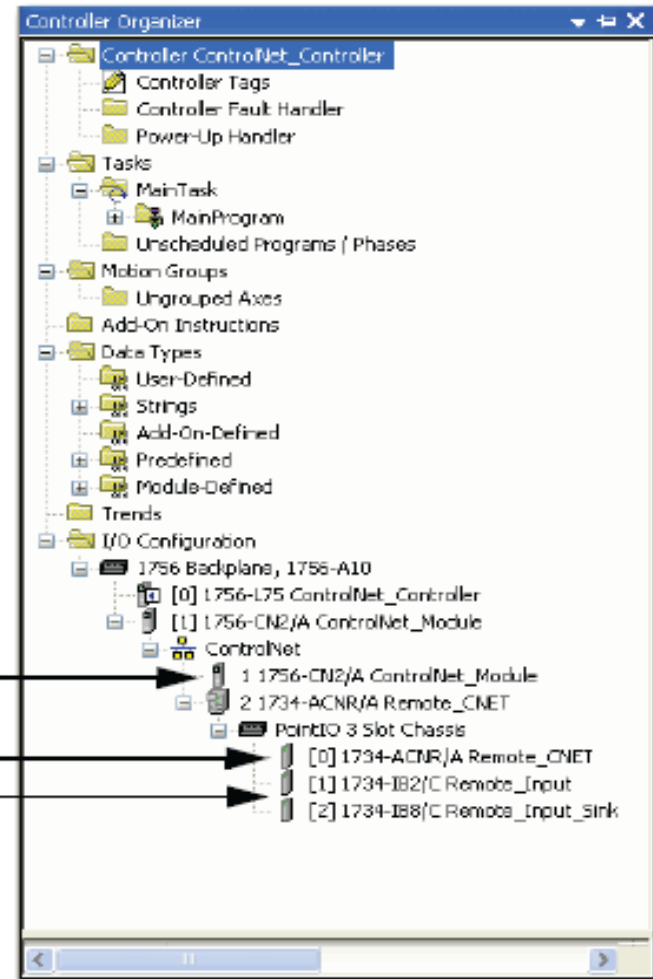


Remote Adapter
and I/O Modules



Local Communication Bridge Module

Remote Adapter for the Distributed I/O Chassis or DIN Rail
Distributed I/O Module



Control I/O Via ControlNet Network

Validate Connections

The screenshot shows the RSLogix 5000 software interface. The main window title is "RSLogix 5000 - Controllogix20 in POWERFLEX_F1_GOOD.ACD [1756-L61 20.3]*". The interface includes a menu bar (File, Edit, View, Search, Logic, Communications, Tools, Window, Help), a toolbar, and a status bar. The "Rem Run" section shows the system is in "Run Mode" with "Controller OK", "Battery OK", and "I/O Not Responding". The "Path" is set to "AB_ETHIP-1\192.168.1.150\Backplane\0*".

The "Controller Organizer" on the left shows the following structure:

- Module-Defined
- Trends
- I/O Configuration
 - 1756 Backplane, 1756-A10
 - [0] 1756-L61 Controllogix20
 - [1] 1756-ENBT/A Ethernet
 - Ethernet
 - [2] 1756-DNB DeviceNet
 - DeviceNet
 - [3] 1756-IB16D DI
 - [4] 1756-OB16D D_O
 - [5] 1756-IA16 A_I
 - [6] 1756-OA16 A_O
 - [7] 1756-CNBR/E LOCAL_CONTROLNET
 - ControlNet
 - 2 1756-CNBR/E LOCAL_CONTROLNET
 - 4 1756-CNBR/E REMOTE_CONTROL
 - 1756 Backplane, 1756-A10
 - [0] 1756-CNBR/E REMOTE_
 - [4] 1756-OB16D REMOTE_

CHOOSING COMMUNICATION FORMAT

The image shows a software interface for configuring a new module. On the left, a tree view displays the project structure, including folders like 'Tasks', 'Motion Groups', and 'I/O Configuration'. Under 'I/O Configuration', a '1756 Backplane, 1756-A10' is expanded to show a 'ControlNet' folder containing a '1756-CNBR/E' module.

The 'New Module' dialog box is open, showing the following configuration details:

- Type: 1756-CNBR/E 1756 ControlNet Bridge, Redundant Media
- Vendor: Allen-Bradley
- Parent: LOCAL_CONTROLNET
- Name: REMOTE_CONTROLNET
- Node: 1
- Chassis Size: 10
- Slot: 0
- Comm Format: Rack Optimization (selected from a dropdown menu)
- Revision: None
- Keying: Compatible Keying

The 'Comm Format' dropdown menu is open, showing the following options:

- Rack Optimization (selected)
- Listen Only - Rack Optimization
- None

At the bottom of the dialog, there are buttons for 'OK', 'Cancel', and 'Help'. Below the dialog, there are buttons for 'Create', 'Close', and 'Help'. A checkbox labeled 'Open Module Properties' is checked. A 'Close on Create' checkbox is also present at the bottom left of the dialog area.

CHOOSING COMMUNICATION FORMAT

Communication Format with a Remote ControlNet Communication Module

Communication Format with a Remote ControlNet Communication Module	Criteria for Use
None	<ul style="list-style-type: none">• When all of the remote I/O communicating with a controller via the remote ControlNet communication module use a Direct Connection communication format• When the connection is used for scheduled peer interlocking• When I/O will be mostly direct connections• When multiple controllers control the outputs in the chassis
Rack-optimized	<ul style="list-style-type: none">• When some or all of the remote I/O communicating with a controller via the remote ControlNet communication module use a rack-optimized communication format• To minimize ControlNet network bandwidth when using large volume of digital I/O• If only one controller will control the I/O
Rack-optimized—Listen only	When some or all of the remote I/O communicating with a controller via the remote ControlNet communication module use a rack-optimized communication format

CHOOSING COMMUNICATION FORMAT

Communication Format with a Remote ControlNet Communication Module

The image shows a screenshot of the Rockwell Automation software interface. On the left is the 'Controller Organizer' tree view, and on the right is the 'Select Module Type' dialog box.

Controller Organizer:

- Tasks
 - MainTask
 - MainProgram
 - Unscheduled Programs / Phases
 - Motion Groups
 - Ungrouped Axes
 - Add-On Instructions
 - Data Types
 - User-Defined
 - Strings
 - Add-On-Defined
 - Predefined
 - Module-Defined
 - Trends
 - I/O Configuration
 - 1756 Backplane, 1756-A10
 - [0] 1756-L61 Controllogix20
 - [1] 1756-ENBT/A Ethernet
 - Ethernet
 - [2] 1756-DNB DeviceNet
 - DeviceNet
 - [3] 1756-IB16D DI
 - [4] 1756-OB16D D_O
 - [5] 1756-IA16 A_I
 - [6] 1756-OA16 A_O
 - [7] 1756-CNBR/E LOCAL_CONTROLNET
 - ControlNet
 - 1 1756-CNBR/E REMOTE_CONTROLNET
 - 1756 Backplane, 1756-A10
 - [0] 1756-CNBR/E REMOTE_COM
 - [1] 1756-IB16

Select Module Type

1756-IB

Analog
 Communication
 Controller
 Digital

Catalog Number
1756-IB16
1756-IB16D
1756-IB16I
1756-IB16ISOE
1756-IB32

5 of 99 Module Type

Open Module Properties

New Module

Type: 1756-IB16 16 Point 10V-31.2V DC Input
Vendor: Allen-Bradley
Parent: REMOTE_CONTROLNET
Name: REMOTE_DI Slot: 1
Description:
Comm Format: Rack Optimization
Revision:
CST Timestamped Input Data
Input Data
Listen Only - CST Timestamped Input Data
Listen Only - Input Data
Rack Optimization

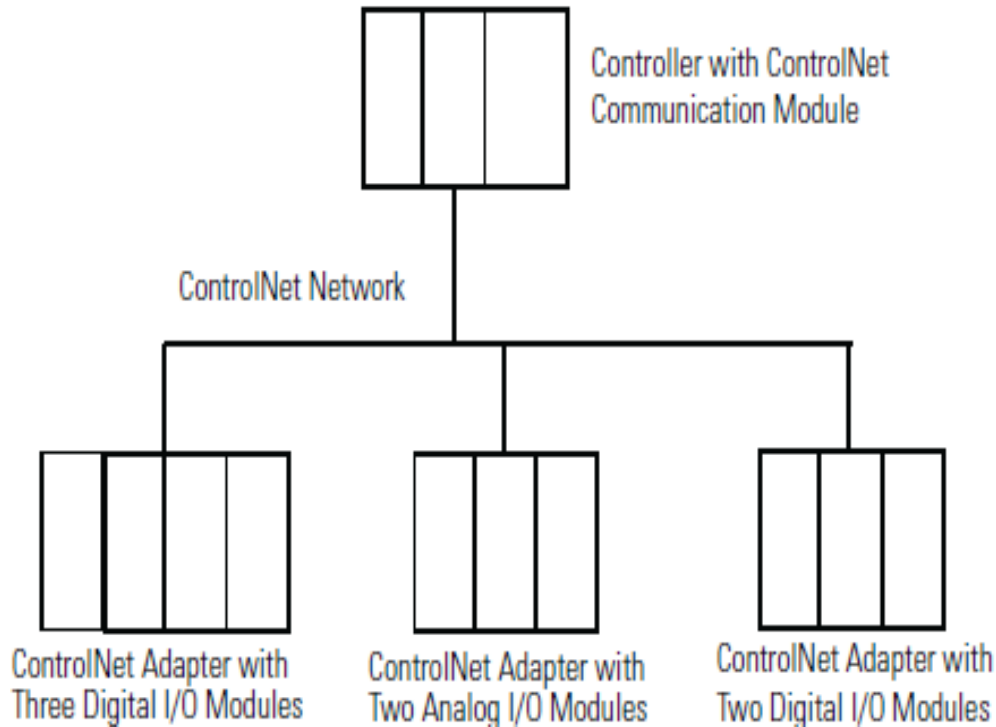
CHOOSING COMMUNICATION FORMAT

Communication Format with a Remote ControlNet Communication Module

I/O Module Type	Desired Connection	Required Communication Format
Digital module	Rack-optimized connection	Rack-optimized
	Direct connection or to use specialty features of the module, such as diagnostics, timestamps, or electronic fuses or Connection for listening to data from the module	<ul style="list-style-type: none">• The data your controller needs from the I/O module. For example, if your application uses a 1756-IA16I module in a remote chassis that must provide timestamped input data, choose the CST Timestamped Input Data communication format.• A listen-only communication format that matches the data the I/O module is broadcasting to other controllers.
Analog module	Direct connection or to use specialty features of the module, such as diagnostics, timestamps, or electronic fuses or Connection for listening to data from the module	<ul style="list-style-type: none">• The data your controller needs from the I/O module. For example, if your application uses a 1756-OF6CI module in a remote chassis that must provide floating point output data, choose the Float Data communication format.• A listen-only communication format that matches the data the I/O module is broadcasting to other controllers.

CHOOSING COMMUNICATION FORMAT

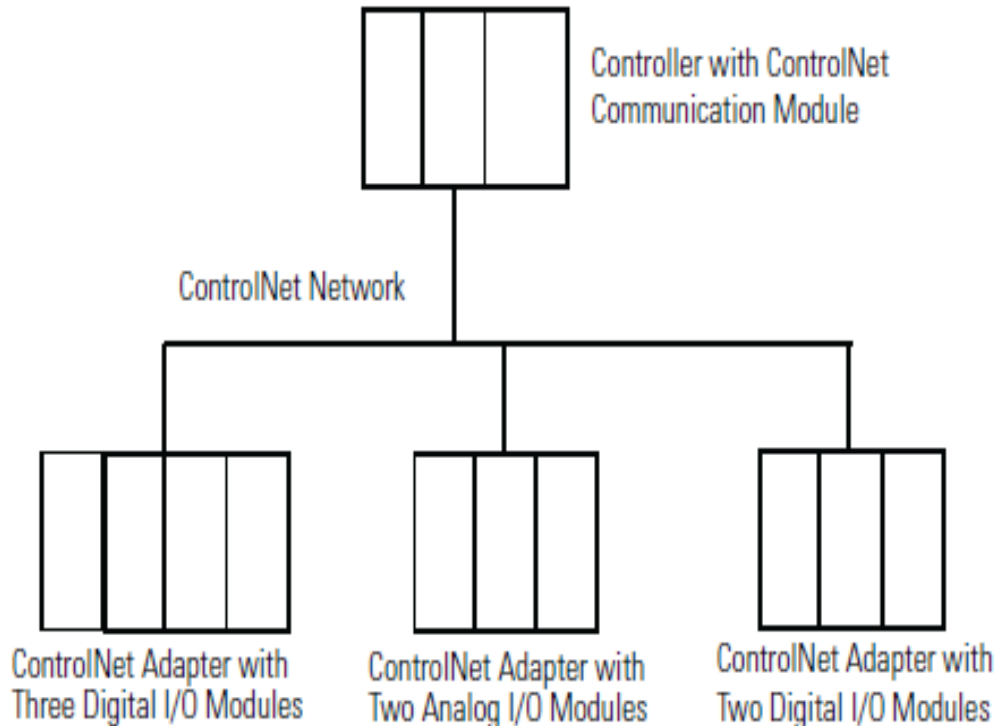
Direct connections for I/O modules



System Connections	Amount
Controller to local ControlNet communication module	0
Controller to ControlNet adapter ⁽¹⁾	0
Direct connection for digital I/O modules	5 digital
Direct connection for analog I/O modules	2 analog
Total connections used	7

CHOOSING COMMUNICATION FORMAT

Rack-optimized connections for I/O Modules



System Connections	Amount
Controller to local ControlNet communication module	0
Controller to ControlNet adapters with digital modules (rack-optimized connection to each adapter)	2
Controller to ControlNet adapter with analog modules (direct connection for each analog I/O module)	2
Total connections used	4

Control distributed I/O over a ControlNet network.

RSLogix 5000

- Configure hardware system: CPU, Local modules, Local ControlNet Module, Remote ControlNet Modules, Remote I/O Modules.
- Write program to control system
- Download program to the CPU

RSNetworx for ControlNet

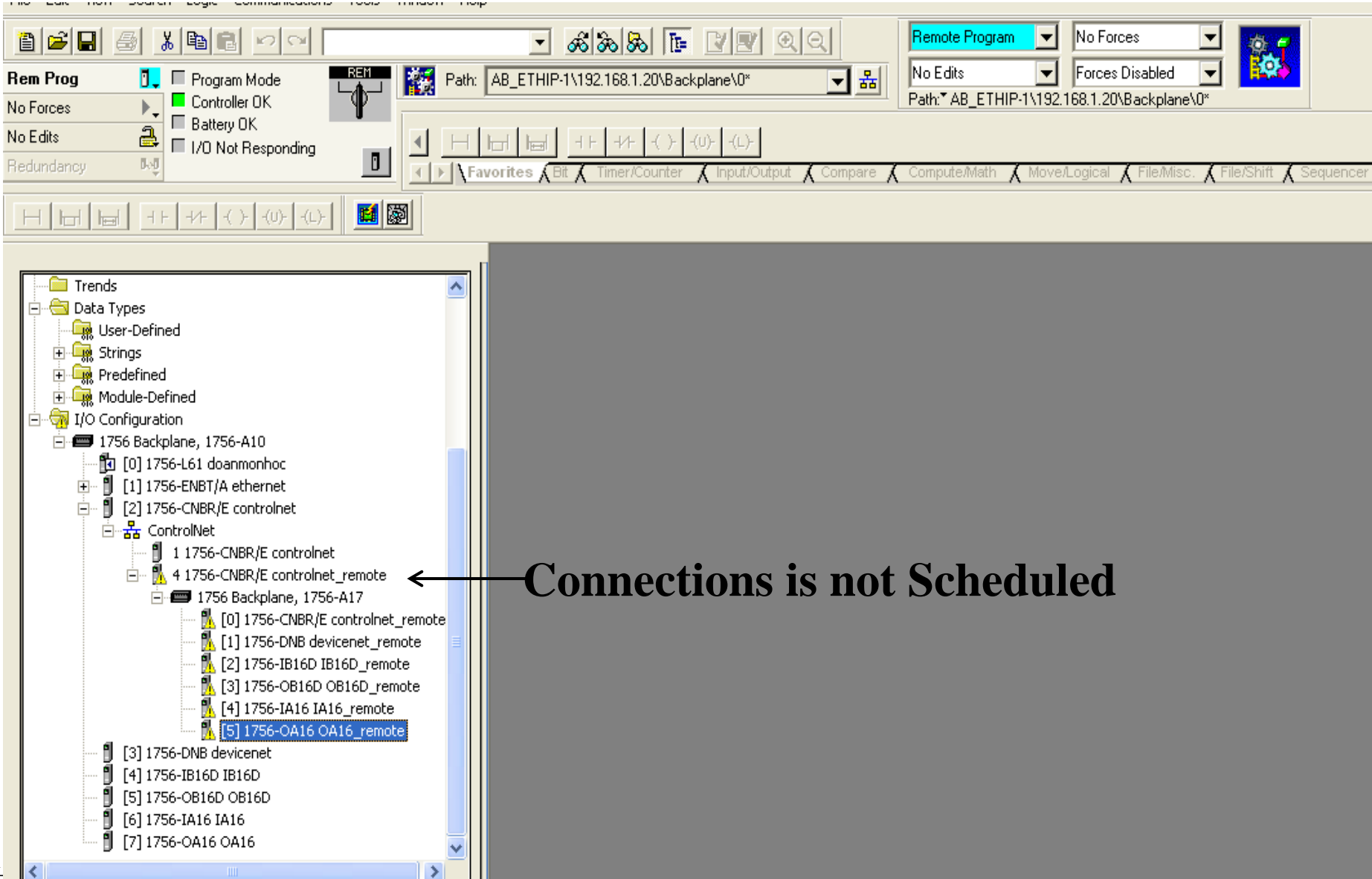
Schedule ControlNet Network

Rechedule controlnet network

Download to network

Control distributed I/O over a ControlNet network.

Using RSLogix 5000 to control system over ControlNet network

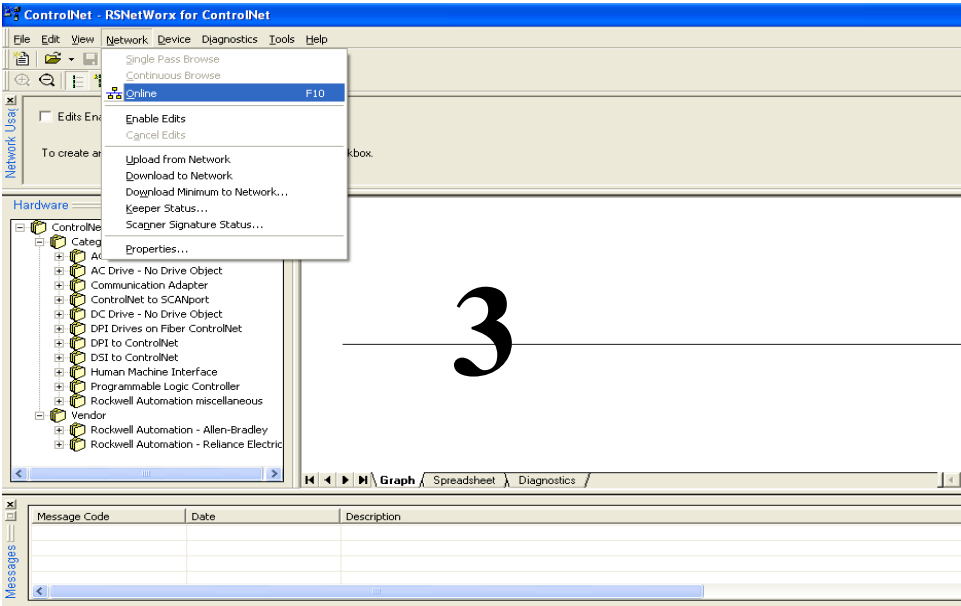
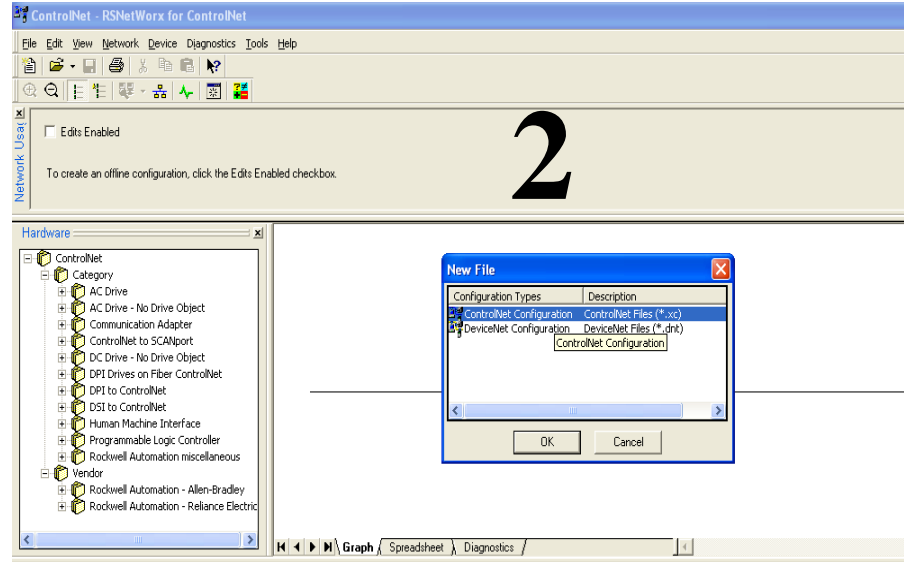
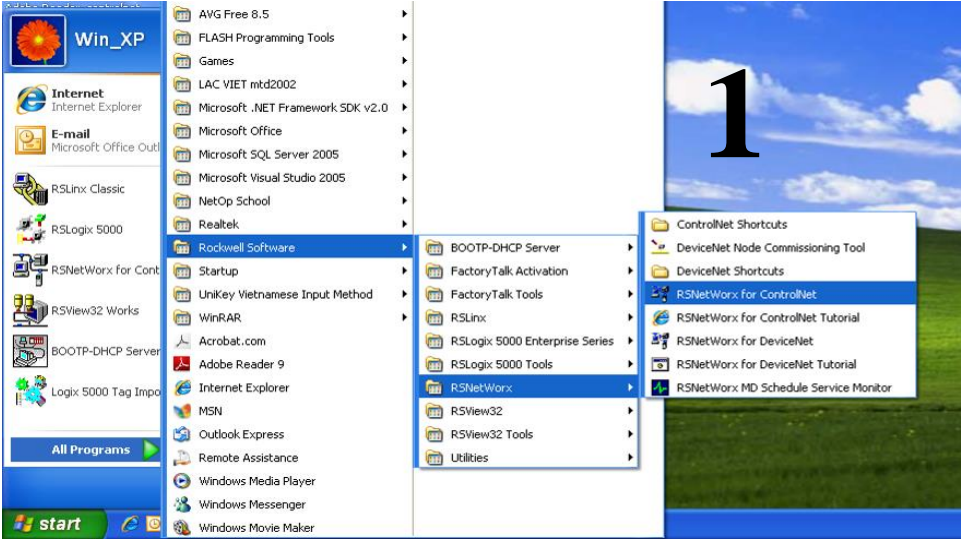


Connections is not Scheduled

F

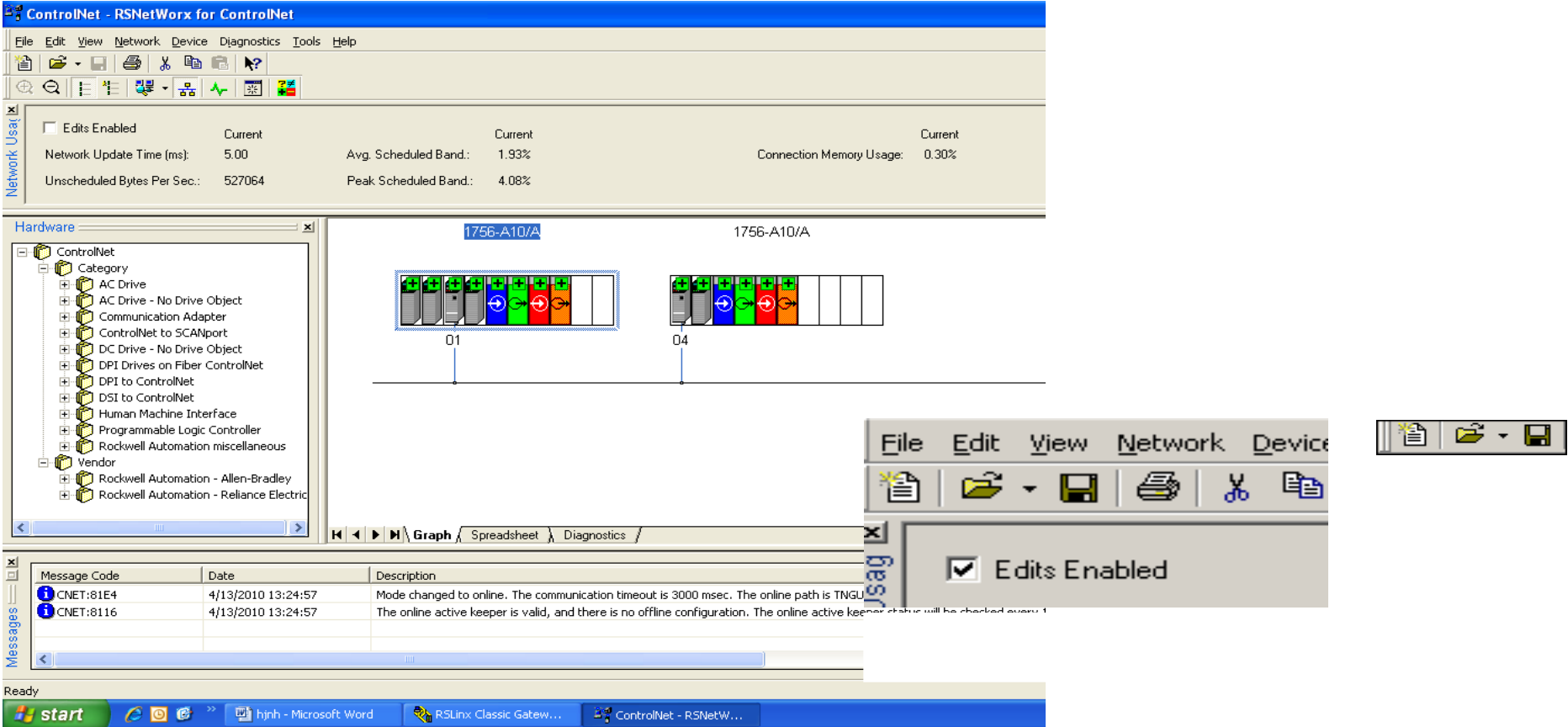
Control distributed I/O over a ControlNet network.

Schedule the Network



Control distributed I/O over a ControlNet network.

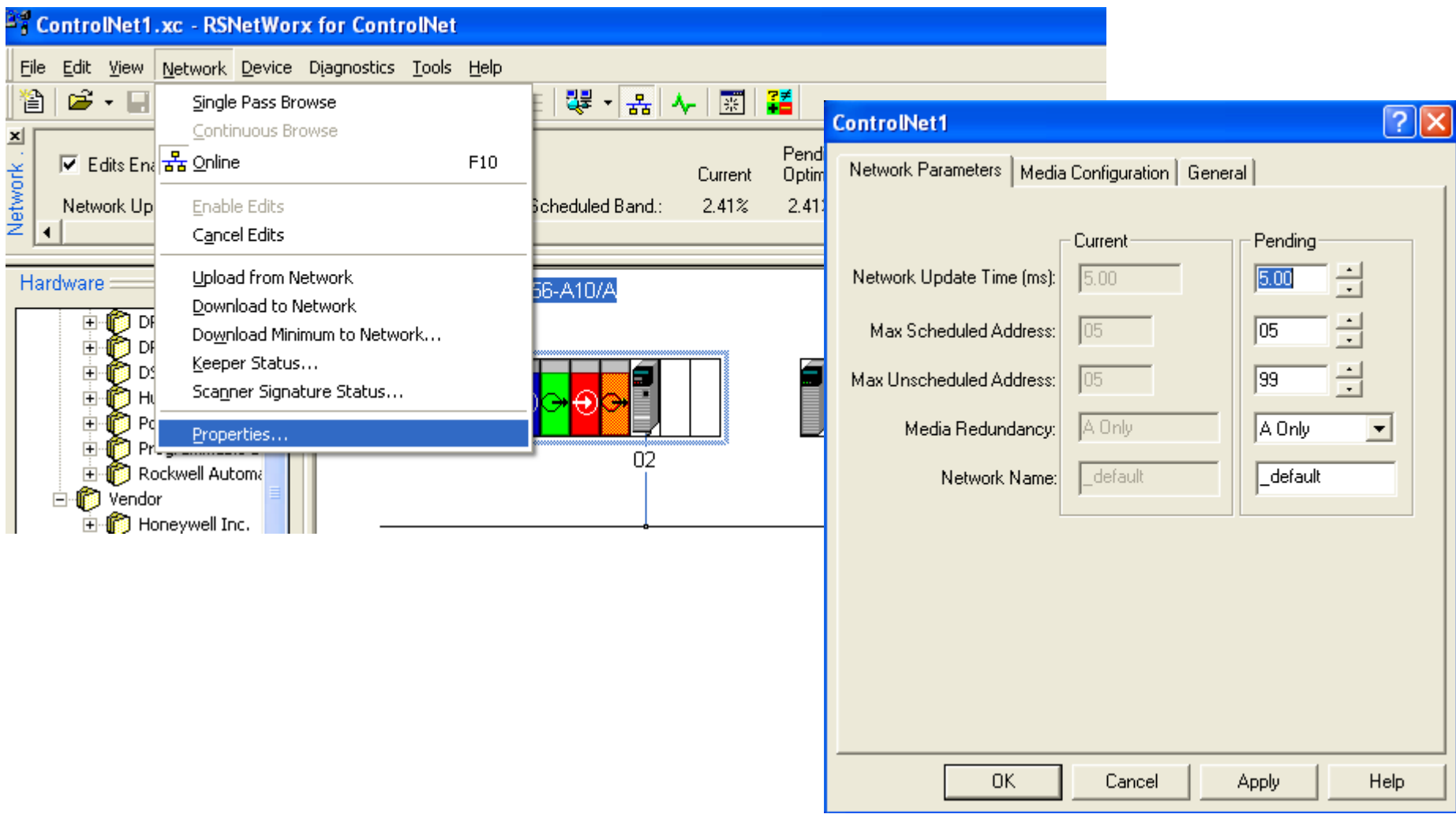
Schedule the Network



Check Edits Enabled, RSNetWorx for ControlNet software reads data in the ControlNet modules and builds a schedule for the network.

Control distributed I/O over a ControlNet network.

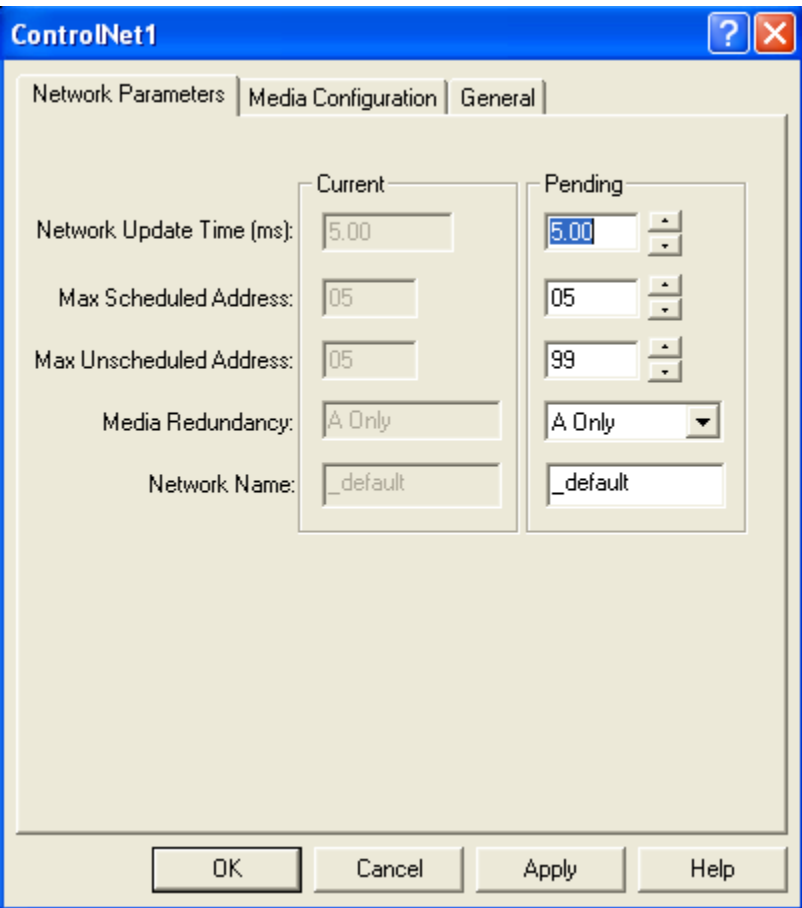
Schedule the Network



To change the network properties from default settings to those that best fit your network, from the Network menu, choose Properties

Control distributed I/O over a ControlNet network.

Schedule the Network



Parameter	Description
Network Update Time	The smallest user-configurable repetitive time cycle in milliseconds at which data can be sent on a ControlNet link.
Max Scheduled Address	The node with the highest network address that can use scheduled time on a ControlNet link. I/O data is transferred during scheduled time. RSNetWorx for ControlNet software sets this value. We recommend that you do not change it.
Max Unscheduled Address	The node with the highest network address that can use unscheduled time on a ControlNet link. Messaging data is transferred during unscheduled time. Nodes set at addresses higher than the maximum unscheduled node do not communicate on the network. For example, they will not display in RSLinx software.
Media Redundancy	Designates if the network uses media redundancy on any of the network communication modules.
Network Name	A user-defined name for the network.

change the network properties from default settings

Control distributed I/O over a ControlNet network.

Schedule the Network online

The screenshot shows the RSNetWorx for ControlNet software interface. At the top, there is a menu bar (File, Edit, View, Network, Device, Diagnostics, Tools, Help) and a toolbar. Below the toolbar is a 'Network Usage' section with a table of statistics:

Edits Enabled	Current	Pending	Avg. Scheduled Band:	Current	Pending Optimized Edits	Pending Merged Edits	Connection Memory Usage
Network Update Time (ms):	5.00	5.00	1.81%	1.81%	1.81%		
Unscheduled Bytes Per Sec.:	555722	555722	Peak Scheduled Band:	3.83%	3.83%	3.83%	

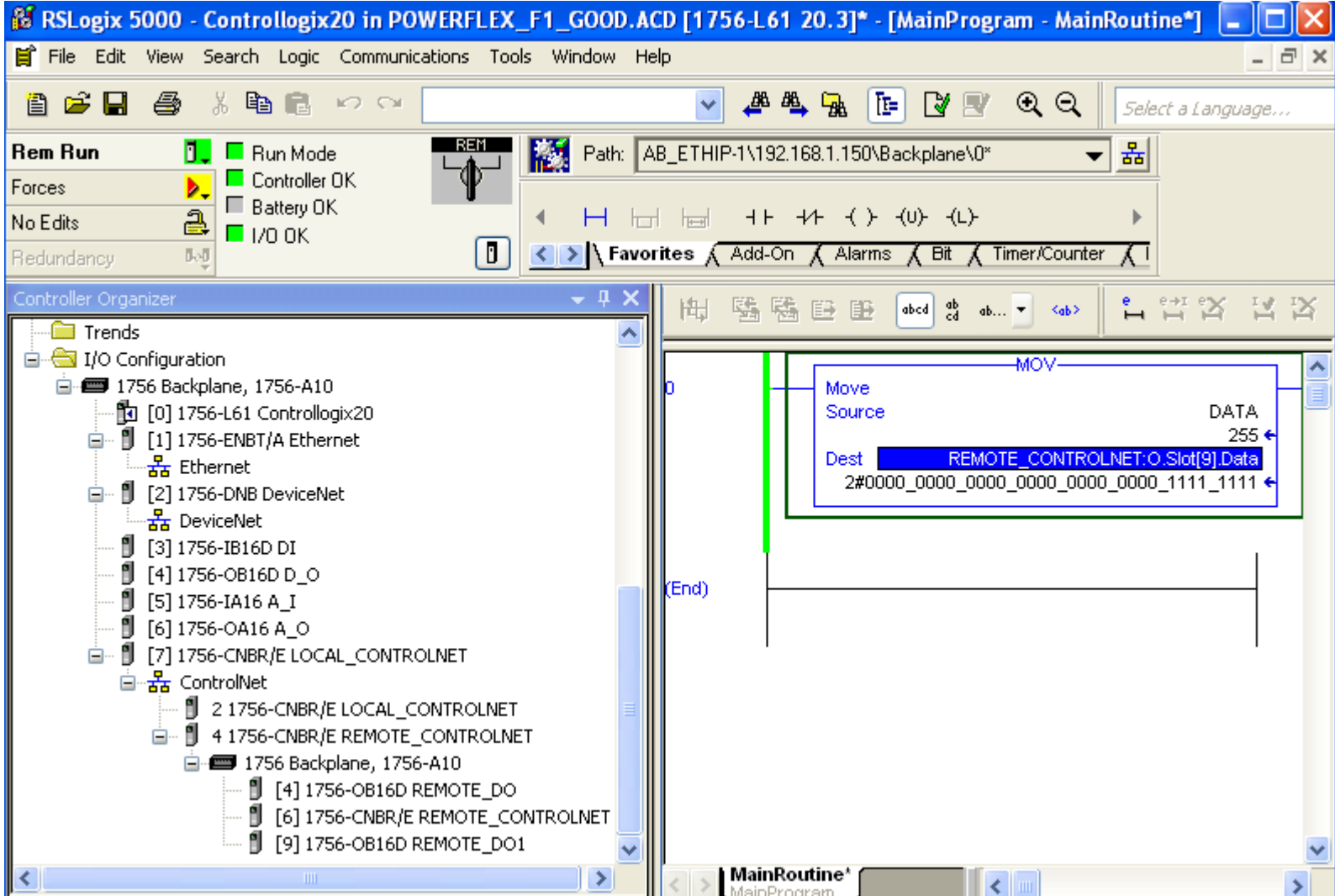
Below the table is a 'Hardware' section showing a tree view of the network topology. The tree includes 'ControlNet' and 'Category' with various device types like 'AC Drive', 'Communication Adapter', etc. The main workspace shows two ControlNet controllers, '1756-A10/A' and '1756-A10/A-1', connected to a network. A 'Save As' dialog box is open, showing the file name 'TRAFFIC_LIGHT' and the save location 'CONTROLNET'. A 'Save Configuration' dialog box is also open, with the 'Optimize and re-write schedule for all connections' option selected.

Save Scheduled File: From the Save Configuration dialog box, click Optimize and rewrite the schedule for all connections.

Selecting merge changes into the existing schedule, those controllers whose connections have not changed remain in Run mode rather than changing to Program mode

Control distributed I/O over a ControlNet network.

Schedule the Network online



After saving, I/O modules are scheduled and good connection

Control distributed I/O over a ControlNet network.

The screenshot displays the Rockwell Automation software interface, specifically the Controller Organizer and the Ladder Logic editor. The Controller Organizer on the left shows a tree view of the system configuration, including I/O Configuration for Slot 9, which is set to REMOTE_CONTROLNET:O.Slot[9]. The ladder logic editor shows a MOV instruction with the destination address REMOTE_CONTROLNET:O.Slot[9].Data. A pop-up window is open over the MOV instruction, displaying a table of remote I/O modules and their data types. The table lists several modules with data types AB:1756_CNB_SL and one module with data type DINT. The DINT module is highlighted, and its details are shown in a separate window below the table.

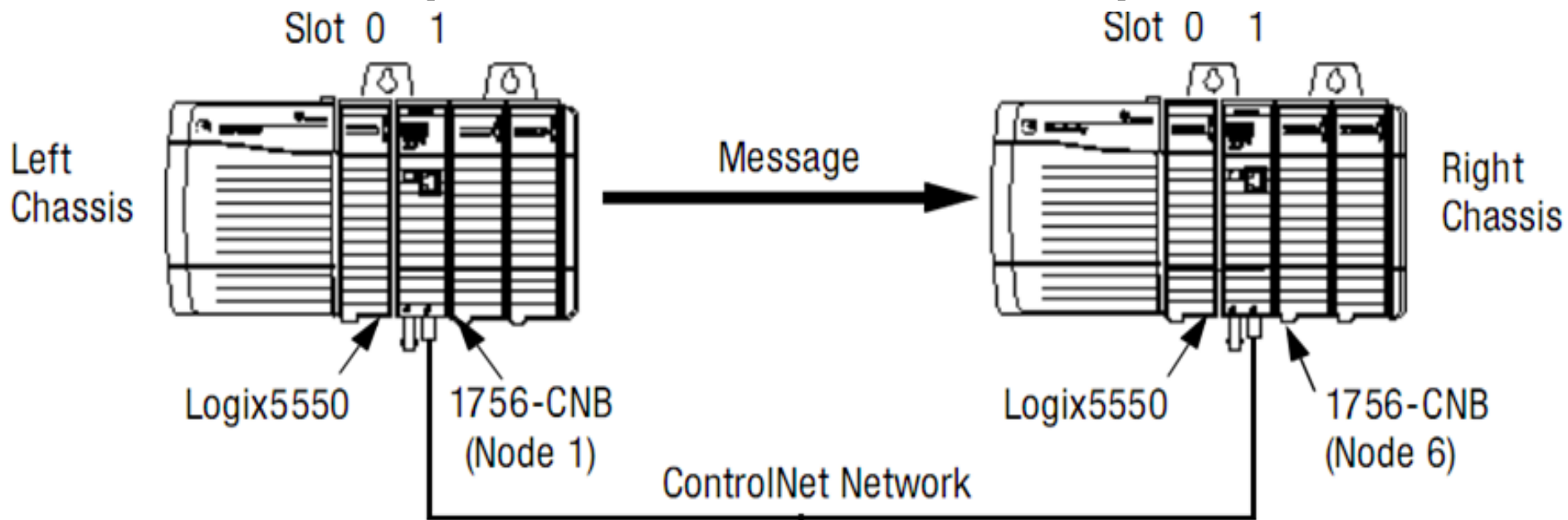
Name	Data Type
+ REMOTE_CONTROLNET:O.Slot[4]	AB:1756_CNB_SL
+ REMOTE_CONTROLNET:O.Slot[5]	AB:1756_CNB_SL
+ REMOTE_CONTROLNET:O.Slot[6]	AB:1756_CNB_SL
+ REMOTE_CONTROLNET:O.Slot[7]	AB:1756_CNB_SL
+ REMOTE_CONTROLNET:O.Slot[8]	AB:1756_CNB_SL
- REMOTE_CONTROLNET:O.Slot[9]	AB:1756_CNB_SL
- REMOTE_CONTROLNET:O.Slot[9]...	DINT

Run speed

Name: REMOTE_CONTROLNET:O.Slot[9].Data
Data Type: DINT
Description:

Writing logic to exchange data with remote I/O modules based on their address in the system.

Produce and Consume Tags (interlock controllers)



➤ Scheduled Message (Produced and consume)

➤ Unscheduled Message (MSG)

Configure hardware system and write logic as the same ethernet network except path information

Điều khiển biến tần PowerFlex 700s qua mạng DeviceNet

Đèn báo trạng thái biến tần















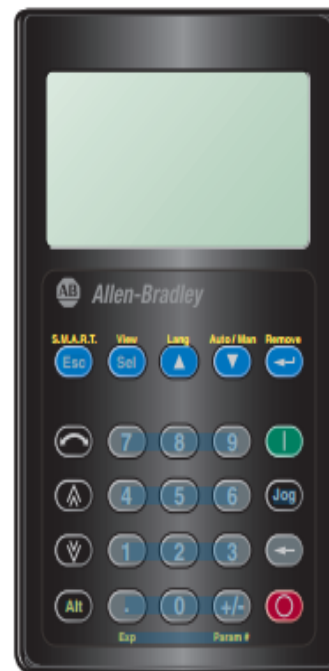
STT	Tên	Màu Sắc	Trạng thái đèn	Trạng thái biến tần
1	PWR (Power)	Xanh	Đứng yên	Biến tần đã được cấp nguồn
2	STS (Status)	Xanh	Chớp tắt	Biến tần đã sẵn sàng nhưng chưa chạy, không có lỗi xảy ra
			Đứng yên	Biến tần đang chạy, không có lỗi xảy ra
		Vàng	Chớp tắt	Cảnh báo loại 2, biến tần vẫn tiếp tục chạy
			Đứng yên	Cảnh báo loại 1, biến tần vẫn tiếp tục chạy
		Đỏ	Chớp tắt	Lỗi xảy ra
			Đứng yên	
3	PORT	Tham khảo thêm tài liệu <i>20-COMM-D DeviceNet Adapter User Manual</i>		
	MOD			
	NETA			
	NETB			

Có 2 cách cài đặt thông số cho biến tần PowerFlex điều khiển biến tần là: DriveExecutive và HIM Key Funtions.

- **HIM Key Funtions:** Cài đặt thông số bằng tay thông qua màn hình KeyPad.
- **DriveExcutive:** Cài đặt thông số qua phần mềm của hãng Allen Bradley cung cấp ứng dụng riêng cho biến tần PowerFlex 700s thông qua mạng DeviceNet.

HIM Key Functions

Key	Description	
	Exit a menu, cancel a change to a parameter value, or acknowledge a fault/alarm.	
	Select a digit, select a bit, or enter edit mode in a parameter screen.	
	Scroll through options, increase a value, or toggle a bit.	
	Scroll through options, decrease a value, or toggle a bit.	
	Enter a menu, enter edit mode in a parameter screen, or save a change to a parameter value.	
	Access the function associated with a programming or numeric key. Provides access to the Large Format Display.	
	Start the drive.	
	Stop the drive or clear a fault.	
	Jog the drive.	
	Change direction.	The keys are active only when the HIM is granted Manual Control or Par 27 [Speed Ref A I] / 28 [Speed Ref B I] is set to: Option 12 "DPI Port 1" for a HIM installed in the drive cover or Option 13 "DPI Port 2" for a HIM connected by cable for handheld or remote installation option
	Increase speed.	
	Decrease speed.	

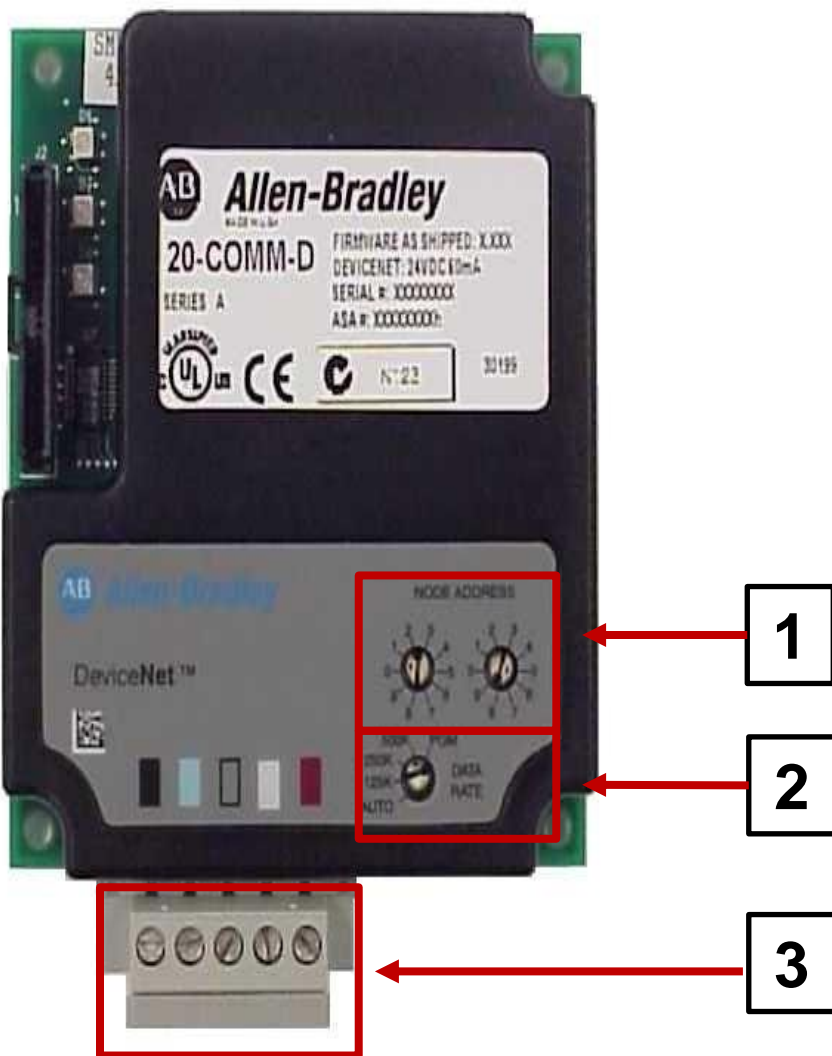


Human Interface Module (HIM)

Module 20-COMM-D Adapter

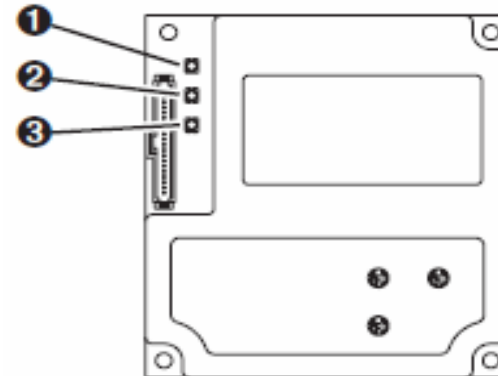
Module 20-COMM-D Adapter là module làm nhiệm vụ liên kết truyền thông giữa biến tần và Scanner trong mạng DeviceNet.

- 1: Switch chọn địa chỉ node của biến tần trong mạng DeviceNet
- 2: Switch chọn tốc độ truyền dữ liệu (Baud rate)
- 3: Chân kết nối mạng DeviceNet:
 - Dây đỏ: +24VDC (V+)
 - Dây trắng: CAN-H
 - Dây xanh: CAN-LOW
 - Dây đen: 0VDC (V-)



20-COMM-D LED INDICATOR

Item	Adapter Status Indicator Name
❶	PORT
❷	MOD
❸	NET A
❹	NET B (not used for DeviceNet)



Chức năng của từng LED chỉ thị		
ST T	Tên đèn chỉ thị	Chức năng
1	PORT	Chỉ trạng thái của việc kết nối cáp DPI giữa biến tần và Adapter
2	MOD	Cho biết trạng thái của quá trình truyền thông trong mạng
3	NET	cho biết việc kết nối Adapter vào mạng có chính xác hay không

Cài đặt các thông số cho Adapter và biến tần

Để biến tần có thể truyền thông trong mạng DeviceNet thì cần phải cấu hình một số thông số cần thiết cho Adapter và biến tần (trên màn hình HIM). Bảng phía dưới là các thông số cần cài đặt cho Adapter DeviceNet.

***Lưu ý:** Muốn cài đặt các thông số cho Adapter thì trong menu chính trên HIM, chọn menu **Deviece Select**, rồi sau đó chọn tiếp **20-COMM-D**.

Thông số	Tên thông số	Chức năng
Pr 03	DN Addr Config	Thiết đặt địa chỉ của Node
Pr 05	DN Rate Config	Thiết lập data rate
Pr 09	Reset Module	Reset module (là việc làm rất cần thiết)
Pr 13	I/O Config	Cho phép hay không cho phép các dữ liệu truyền và nhận
Pr 25	M-S Input	Cho phép hay không cho phép dữ liệu nhận ở chế độ master-slave
Pr 26	M-S Output	Cho phép hay không cho phép dữ liệu gửi ở chế độ master-slave

Cài đặt các thông số cho Adapter và biến tần

Người dùng cần phải nhập một số thông số cơ bản sau để biến tần hoạt động:

Bước 1: Khai báo thông số định mức trên nhãn động cơ (**Motor Data**) ở mục **Motor Control**.

Thông số	Tên thông số	Chức năng
1	Motor NP Volts	Khai báo thông số điện áp định mức của động cơ
2	Motor NP FLA	Khai báo thông số dòng điện định mức của động cơ
3	Motor NP Hertz	Khai báo tần số định mức của động cơ
4	Motor NP RPM	Khai báo tốc độ định mức của động cơ
5	Motor NP Power	Khai báo công suất định mức của động cơ
7	Motor Poles	Khai báo số cực động cơ

Cài đặt các thông số cho Adapter và biến tần

BƯỚC 2: Cài đặt thông số điều khiển tốc độ cho động cơ mục **Speed Control**.

Thông số	Tên thông số	Chức năng
Par 17	Jog Speed 1	Cài đặt tốc độ chạy thử 1 cho động cơ
Par 18	Jog Speed 2	Cài đặt tốc độ chạy thử 2 cho động cơ
Par 27	Speed Ref A Sel	Chọn nguồn tần số cho biến tần Lưu ý: Par 27: Speed Ref A Sel =16 “DPI port 5”. Khi set thông số này lên 16 thì ta không thể đặt tốc độ tham chiếu bằng HIM nữa mà bằng network (devicenet)
Par 30	Rev Speed Limit	Cài đặt tốc độ giới hạn khi động cơ chạy nghịch
Par 31	Fwd Speed Limit	Cài đặt tốc độ giới hạn khi động cơ chạy thuận
Par 32	Accel Time	Thời gian tăng tốc
Par 33	Decel Time	Thời gian giảm tốc

Cài đặt các thông số cho Adapter và biến tần

Bước 3: Giám sát tốc độ và các thông số liên quan của động cơ khi động cơ hoạt động vào mục **Monitor**

Thông số	Tên thông số	Chức năng
Par 310	Output Freq	Tần số ngõ ra
Par 307	Output Voltage	Điện áp ngõ ra
Par 308	Output Current	Dòng điện ngõ ra
Par 311	Output Power	Công suất ngõ ra
Par 306	DC Bus Voltage	Điện áp trên Bus DC
Par 313	Heatsink Temp	Nhiệt độ tản nhiệt
Par 310	Output Freq	Tần số ngõ ra

Đến đây, việc cài đặt các thông số phục vụ cho truyền thông xem như đã hoàn thành.

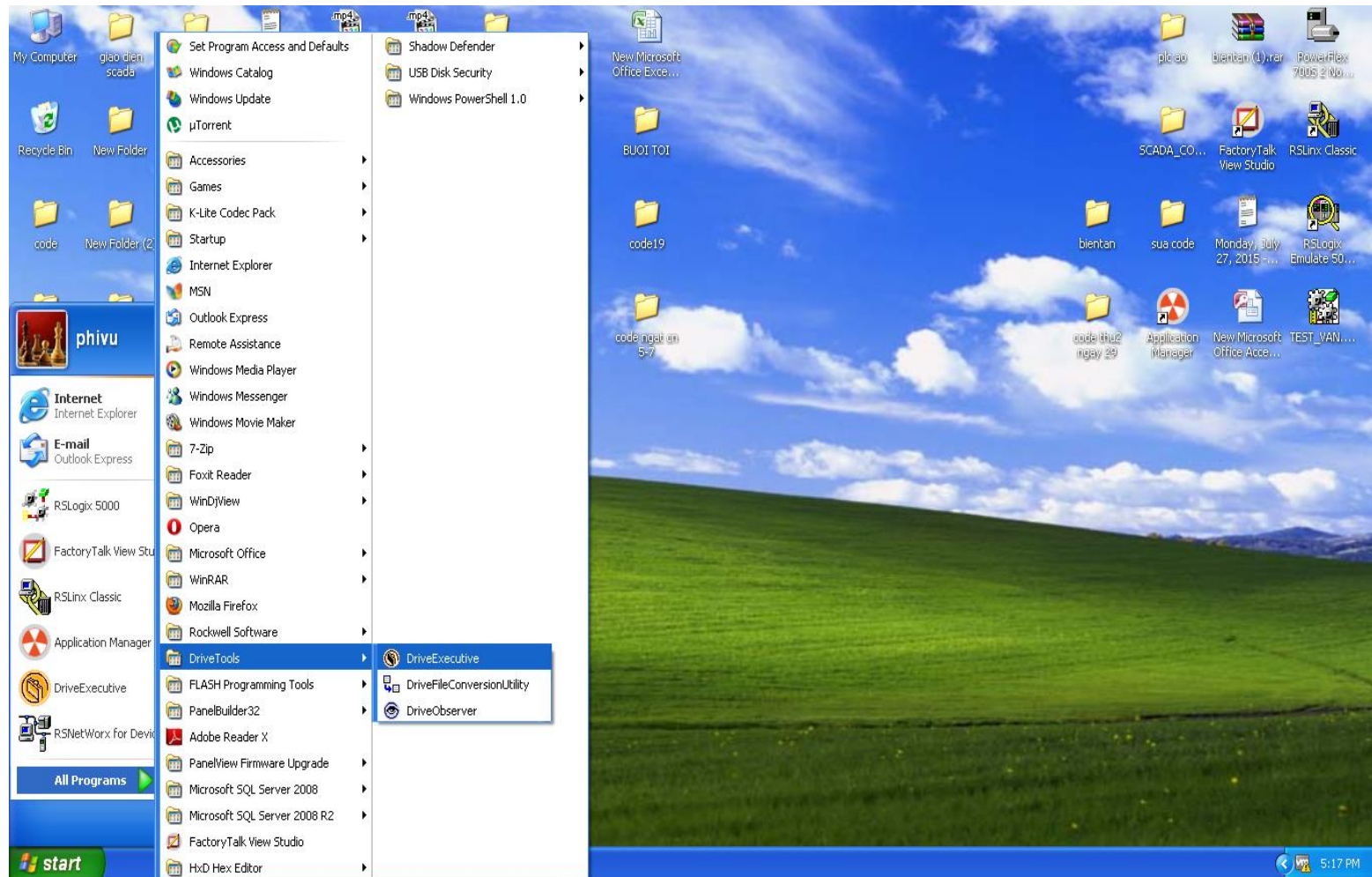
Driver Executive

The screenshot displays the DriveExecutive software interface within a VMware Workstation environment. The main window shows a control panel with buttons for Stop, Start, Jog1, Jog2, and C.Stop, along with a Speed Reference input field set to 0.0. Below the control panel is a tree view showing the project structure, including a 'Node 20' containing various control modules like Motor Control, Dynamic Control, and Speed Control. The 'Parameter List' window is open, displaying a table of parameters for 'Port 0: Parameter List'.

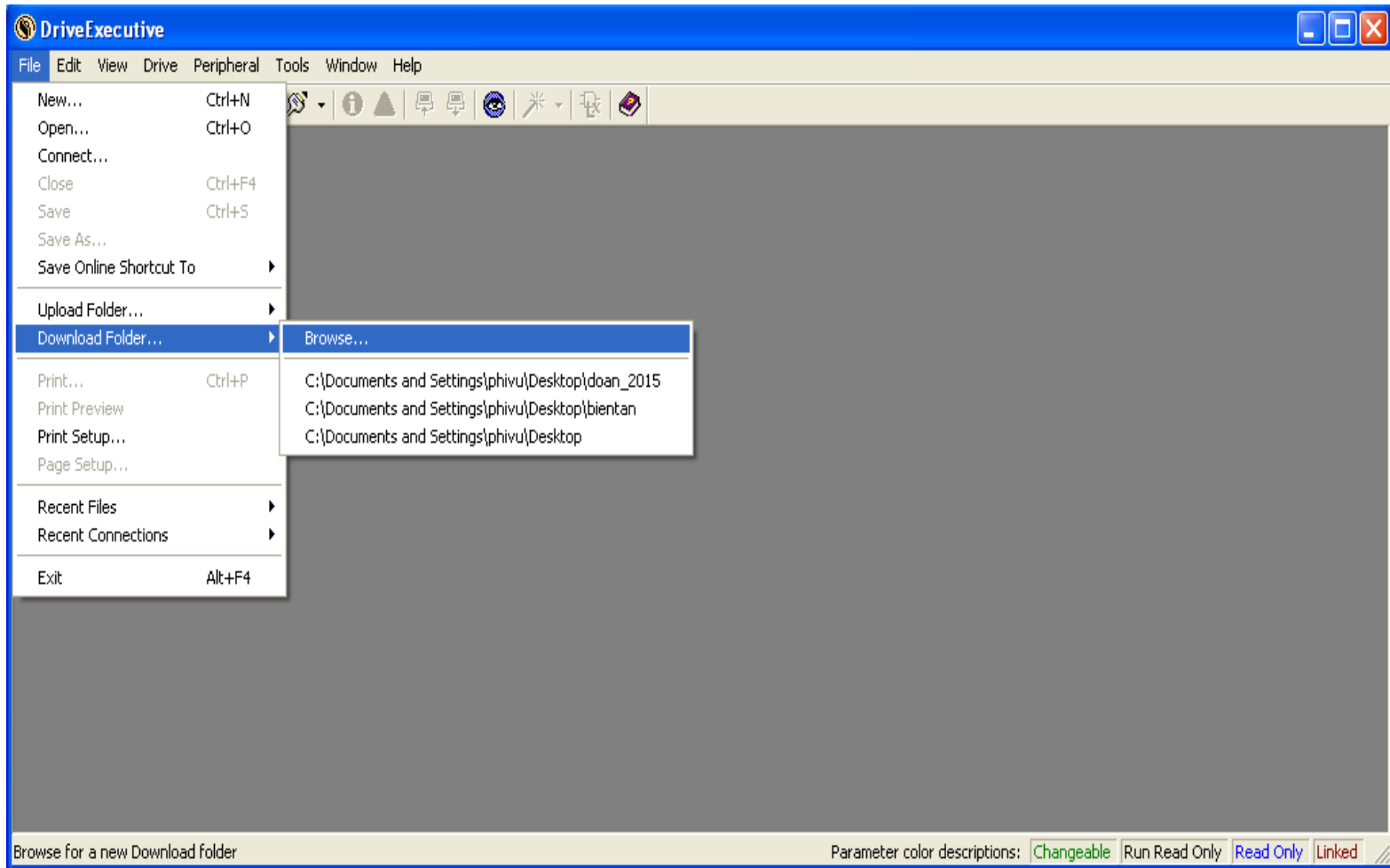
#	Parameter Name	Value	Units	Internal Value	Sou...	Comment	Default	Min	Max
1	Motor NP Volts	208	Volt	208	0		75	705	
2	Motor NP FLA	3.7000	Amps	0x406CCCCD	0		3.4000	0.1000	3000
3	Motor NP Hertz	50.0000	Hz	0x42480000	0		50.0000	2.0000	500.0
4	Motor NP RPM	1380	RPM	1380	0		1450	1	3000
5	Motor NP Power	0.7500	kW	0x3F400000	0		0.7500	0.2500	3500
6	Mtr NP Pwr Units	kW		1	0		kW	Hp	kW
7	Motor Poles	4	Pole	4	0		4	2	128
9	Total Inertia	2.0000	Sec	0x40000000	0		2.0000	0.0100	655.0
10	Speed Ref 1	0.0000		0x00000000	0		0.0000	-2200000000.0000	2200
11	Spd Ref1 Divide	1.0000		0x3F800000	0		1.0000	-2200000000.0000	2200
12	Speed Ref 2	0.0000		0x00000000	0		0.0000	-2200000000.0000	2200
13	Spd Ref2 Multi	1.0000		0x3F800000	0		1.0000	-2200000000.0000	2200
14	Preset Speed 1	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
15	Preset Speed 2	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
16	Preset Speed 3	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
17	Preset Speed 4	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
18	Preset Speed 5	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
19	Preset Speed 6	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
20	Preset Speed 7	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
21	Speed Trim 1	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
22	Speed Trim 2	0.0000	RPM	0x00000000	318		0.0000	-11040.0000	1104
23	Speed Trim 3	0.0000	RPM	0x00000000	0		0.0000	-11040.0000	1104
24	SpdTrim 3 Scale	1.0000		0x3F800000	0		1.0000	-1000.0000	1000
25	STrim2 Filr Gain	1.0000		0x3F800000	0		1.0000	-15.0000	15.0
26	SpdTrim2 Filr BW	200.0000	R/s	0x43480000	0		200.0000	0.0000	1000

Phần mềm DriveExecutive sử dụng các ô nhớ truyền thông qua mạng DeviceNet để điều khiển động cơ và đọc tín hiệu hồi tiếp Encoder.

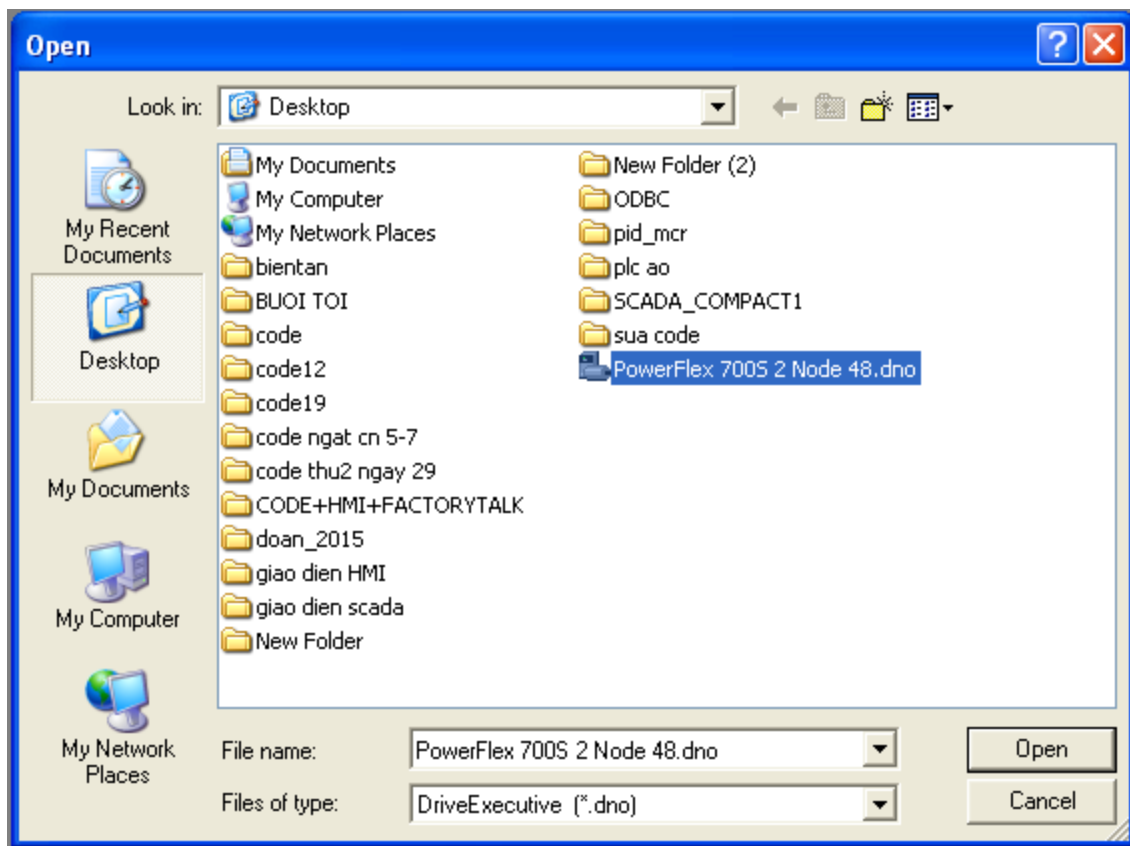
Mở phần mềm DriveExecutive



1. Download một chương trình có sẵn với các thông số phù hợp cho động cơ hoạt động

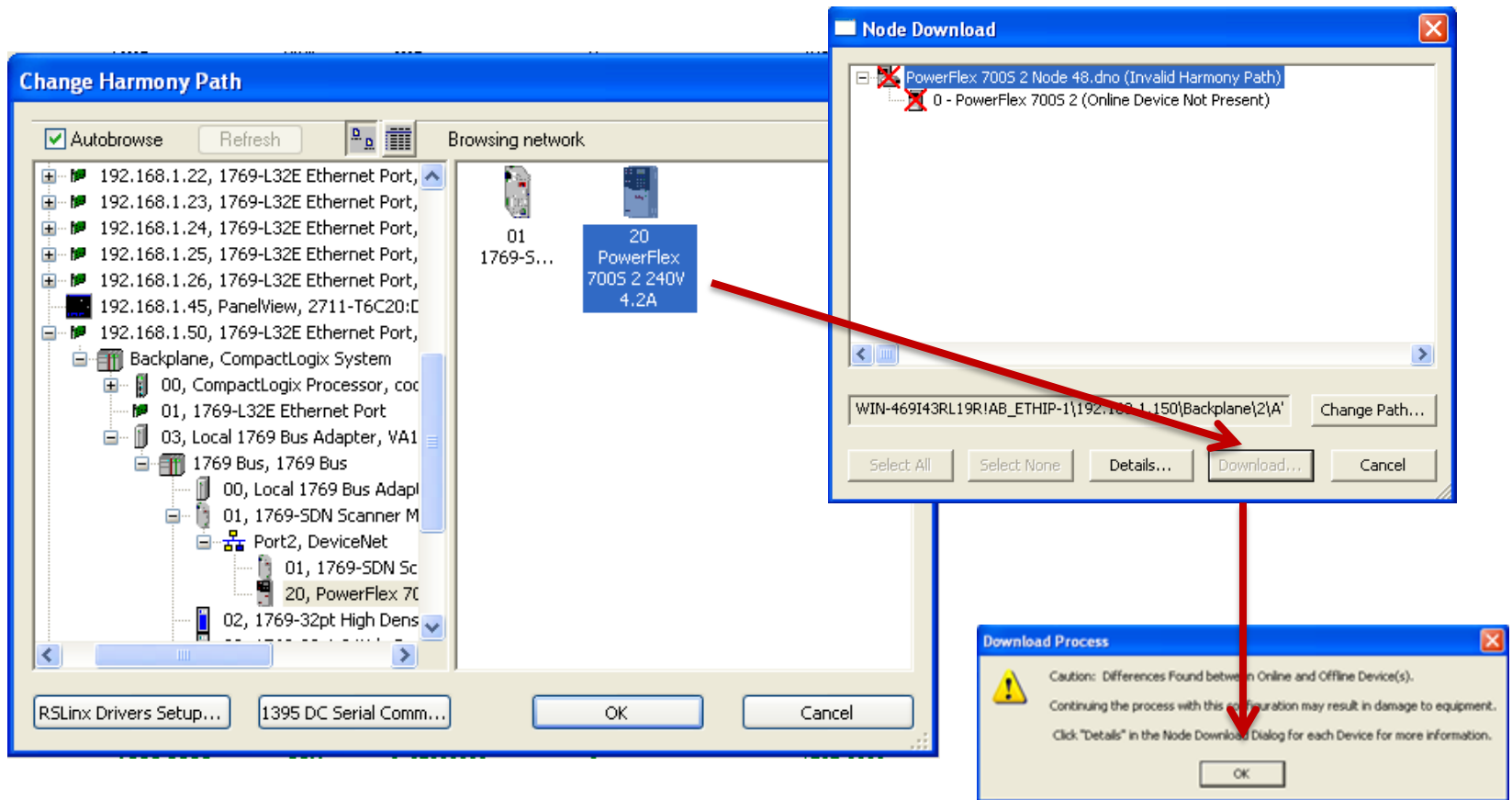


Chọn file cần Download



Nhấp vào **Change Path...** và chọn địa chỉ PLC có kết nối với biến tần

Nhấn **OK** tiếp theo nhấn **Download** để bắt đầu quá trình Download



Quá trình **Download** thực hiện các thông số được download xuống biến tần.

The screenshot displays the 'Node Download' process in a software application. The main window shows a tree view of nodes under 'PowerFlex: 700S 2 Node 48.dno'. The 'Node Download' dialog box is open, showing a progress bar at 0% and a path: SKY-A9A05C886A11AB_ETHIP-1\192.168.1.50\Backplane\3\17. The 'Downloading Links' dialog box is also open, showing a progress bar at 7% and details: File Name: C:\Documents and Settings\phivu\Desktop\PowerFlex; Device: PowerFlex 700S 2 (v4.002); Configuration: 208V 4.8A; Sink Parameter: 86; Source Parameter: 0; Elapsed Time: 250 ms; Samples Read: 45; Average Time: 244 ms; Total Elapsed Time: 11.001 sec.

	Units	Internal Value	Comment	Default	Min	Max
Volt		208		208	75	705
Amps	0x406CCCCD			3.4000	0.1000	3000.0000
Hz	0x42480000			50.0000	2.0000	500.0000
RPM		1380		1450	1	30000
Hp	0x3F400000			0.7500	0.2500	3500.0000
					Hp	kw
					2	128
					0.0100	655.0000
					-2200000000.0000	2200000000.0000
					0.000000000.0000	0.000000000.0000

Node Download: 700S 2 Node 48.dno (SKY-A9A05C886A11AB_ETHIP-1\192.168.1.50\Backplane\3\17) Port 5 - 20-COMM-D: Skipped Port 1 - 20-HIM-xx SER B: Skipped

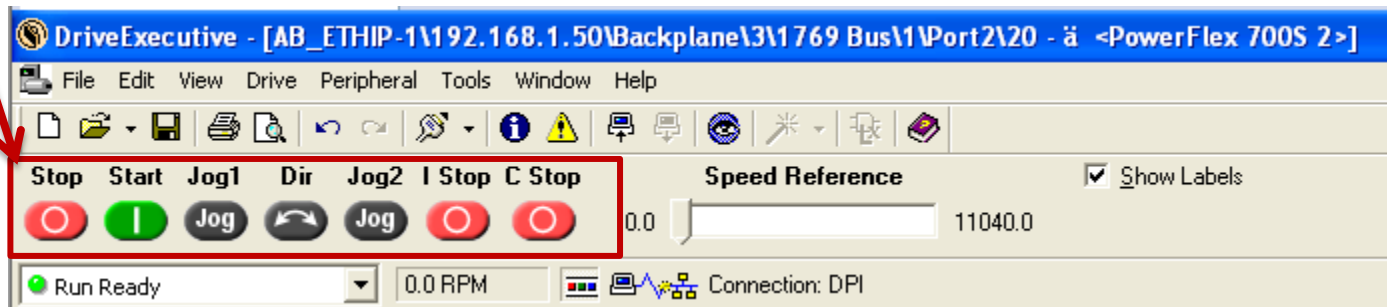
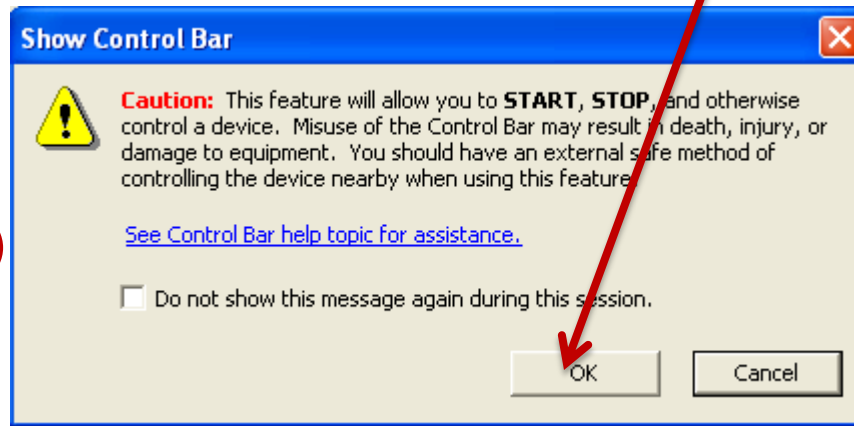
19	Preset Speed 6					
20	Preset Speed 7					
21	Speed Trim 1					
22	Speed Trim 2					
23	Speed Trim 3					
24	SpdTrim 3 Scale					
25	STRim2 Filt Gain					
26	SpdTrim2 Filt BW					
27	Speed Ref A Sel					
28	Speed Ref B Sel					
29	Jog Speed 1					
30	Min Spd Ref Lim	-1380.0000	RPM	0x6F800000	-1725.0000	
31	Max Spd Ref Lim	1380.0000	RPM	0x3F800000	1725.0000	

Điều khiển khởi động và chạy Jog trên phần mềm DriveExecutive

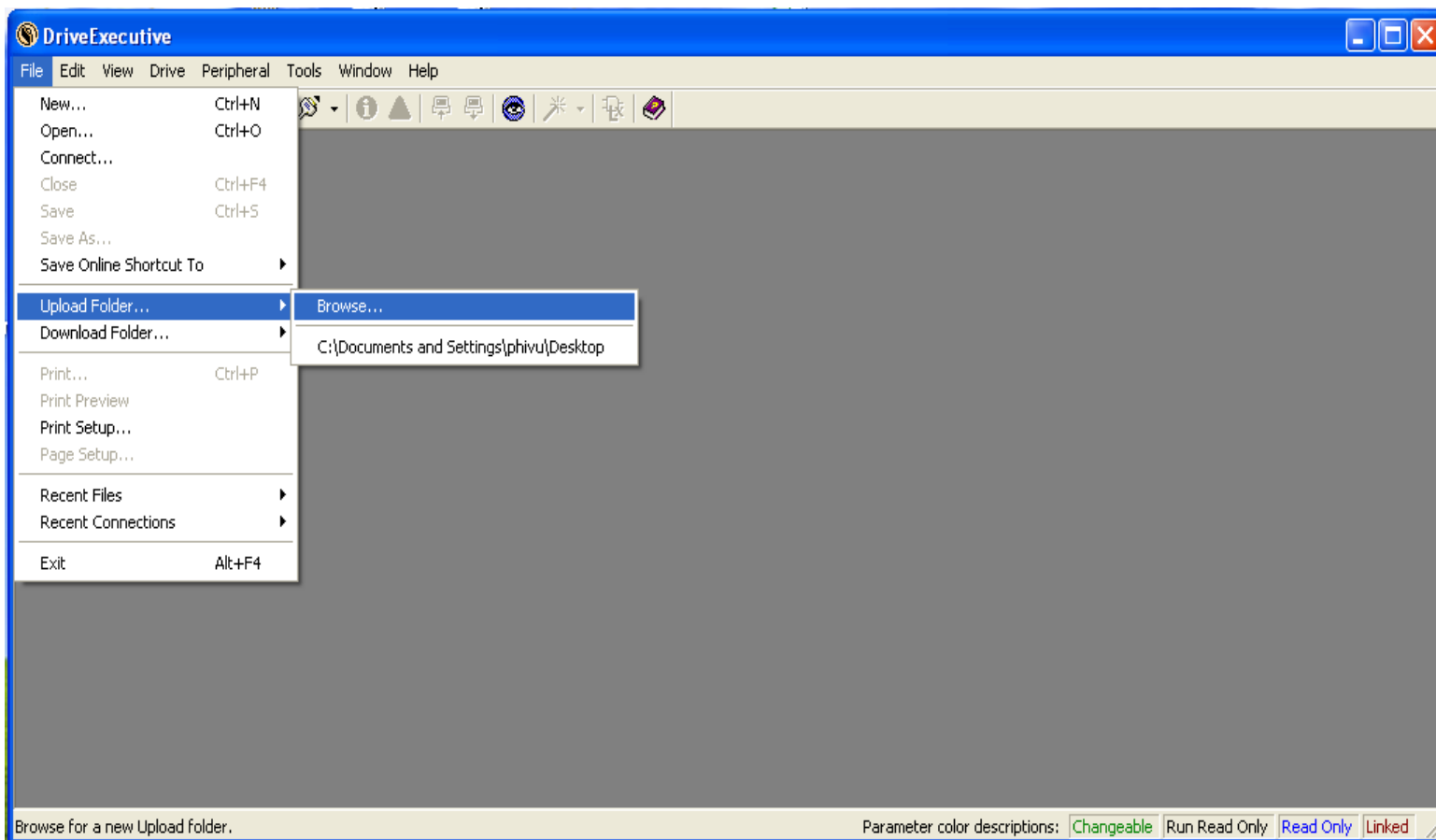
Nhấn vào biểu tượng



Nhấn nút điều khiển



2. Tương tự quá trình **Download** ta thực hiện quá trình **Upload** từ biển tần lên máy tính như sau



Cài đặt thông số định mức động cơ và giới hạn tốc độ, thời gian tăng tốc, giảm tốc và chế độ chạy Jog,...

Vào phần **Diagrams => Parameter List**

The screenshot shows a software interface with a tree view on the left and a main window displaying a table titled "Port 0: Parameter List". The tree view shows "Node 20" expanded to "Diagrams" and "Parameter List". The main window displays a table with the following columns: #, Parameter Name, Value, Units, Internal Value, Comment, Default, Min, and Max.

#	Parameter Name	Value	Units	Internal Value	Comment	Default	Min	Max
1	Motor NP Volts	208	Volt	208		208	75	705
2	Motor NP FLA	3.7000	Amps	0x406CCCCD		3.4000	0.1000	3000.0000
3	Motor NP Hertz	50.0000	Hz	0x42480000		50.0000	2.0000	500.0000
4	Motor NP RPM	1380	RPM	1450		1	1	30000
5	Motor NP Power	0.7500	kW	0x3F400000		0.7500	0.2500	3500.0000
6	Mtr NP Pwr Units	kW		1		kW	Hp	kW
7	Motor Poles	4	Pole	4		4	2	128
9	Total Inertia	2.0000	Sec	0x40000000		2.0000	0.0100	655.0000
10	Speed Ref 1	0.0000		0x00000000		0.0000	-2200000000.0000	2200000000.0000
11	Spd Ref1 Divide	1.0000		0x3F800000		1.0000	-2200000000.0000	2200000000.0000
12	Speed Ref 2	0.0000		0x00000000		0.0000	-2200000000.0000	2200000000.0000
13	Spd Ref2 Multi	1.0000		0x3F800000		1.0000	-2200000000.0000	2200000000.0000
14	Preset Speed 1	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
15	Preset Speed 2	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
16	Preset Speed 3	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
17	Preset Speed 4	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
18	Preset Speed 5	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
19	Preset Speed 6	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
20	Preset Speed 7	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
21	Speed Trim 1	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
22	Speed Trim 2	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
23	Speed Trim 3	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
24	SpdTrim 3 Scale	1.0000		0x3F800000		1.0000	-1000.0000	1000.0000
25	STrim2 Flt Gain	1.0000		0x3F800000		1.0000	-15.0000	15.0000
26	SpdTrim2 Flt BW	200.0000	R/S	0x43480000		200.0000	0.0000	1000.0000
27	Speed Ref A Sel	DPI Port 5		16		Speed Ref 1	Zero Speed	DPI Port 5
28	Speed Ref B Sel	Speed Ref 1		1		Speed Ref 1	Zero Speed	DPI Port 5
29	Jog Speed 1	1000.0000	RPM	0x3F3981DB		0.0000	-11040.0000	11040.0000
30	Min Spd Ref Lim	-1380.0000	RPM	0xBF800000		-1725.0000	-11040.0000	11040.0000
31	Max Spd Ref Lim	1380.0000	RPM	0x3F800000		1725.0000	-11040.0000	11040.0000
32	Accel Time 1	10.0000	Sec	0x41200000		10.0000	0.0100	6553.5000
33	Decel Time 1	10.0000	Sec	0x41200000		10.0000	0.0100	6553.5000

Cài đặt thông số truyền nhận dữ liệu. Vào phần **5-20-COMM-D** => **Device Parameter**

DriveExecutive - [PowerFlex 700S 2 Node 48.dno - ä <PowerFlex 700S 2>]

File Edit View Drive Peripheral Tools Window Help

Back Next

Undefined Node

- 0 - PowerFlex 700S 2
 - Diagrams
 - Parameter List
 - Monitor
 - Motor Control
 - Dynamic Control
 - Speed Control
 - Torque Control
 - Process Control
 - Position Control
 - Speed/Posit. Fdbk
 - Utility
 - Communication
 - Inputs & Outputs
 - User Functions
 - Default Custom
- 1 - 20-HIM-xx SER B
- 5 - 20-COMM-D
 - Device Parameters
 - Default Custom

Port 5: Device Parameters

#	Parameter Name	Value	Units	Internal Value	Comment	Default	Min	Max
1	DPI Port	5		5		0	0	7
2	DPI Data Rate	500kbps		1		125kbps	125kbps	500kbps
3	DN Addr Cfg	48		48		63	0	63
4	DN Addr Act	48		48		63	0	63
5	DN Rate Cfg	125kbps		0		Autobaud	125kbps	Autobaud
6	DN Rate Act	125kbps		0		125kbps	125kbps	500kbps
7	Ref / Fdbk Size	32-bit		1		16-bit	16-bit	32-bit
8	Datalink Size	32-bit		1		16-bit	16-bit	32-bit
9	Reset Module	Ready		0		Ready	Ready	Set Defaults
10	Comm Flt Action	Hold Last		3		Fault	Fault	Send Flt Cfg
11	Idle Flt Action	Hold Last		3		Fault	Fault	Send Flt Cfg
12	DN Active Cfg	Switches		0		Switches	Switches	EEPROM
13	DPI I/O Cfg	00000011		3		00000001	00000000	00011111
14	DPI I/O Act	00000011		3		00000001	00000000	00011111
15	Flt Cfg Logic	00000000000000...		0		0000000000000000	0000000000000000	11111111111111
16	Flt Cfg Ref	0		0		0	0	4294967295
17	Flt Cfg A1 In	0		0		0	0	4294967295
18	Flt Cfg A2 In	0		0		0	0	4294967295
19	Flt Cfg B1 In	0		0		0	0	4294967295
20	Flt Cfg B2 In	0		0		0	0	4294967295
21	Flt Cfg C1 In	0		0		0	0	4294967295
22	Flt Cfg C2 In	0		0		0	0	4294967295
23	Flt Cfg D1 In	0		0		0	0	4294967295
24	Flt Cfg D2 In	0		0		0	0	4294967295
25	M-S Input	00000001		1		00000001	00000000	00011111
26	M-S Output	00000011		3		00000001	00000000	00011111
27	COS Status Mask	00000000000000...		0		0000000000000000	0000000000000000	11111111111111
28	COS Fdbk Change	0		0		0	0	4294967295
29	COS/Cyc Interval	0.00	s	0		0.00	0.00	655.35
30	Peer A Input	Off		0		Off	Off	DL D Input

Cài đặt thông số định mức động cơ và giới hạn tốc độ, thời gian tăng tốc, giảm tốc và chế độ chạy Jog,...

Vào phần **Diagrams => Parameter List**

Port 0: Parameter List								
#	Parameter Name	Value	Units	Internal Value	Comment	Default	Min	Max
1	Motor NP Volts	208	Volt	208		208	75	705
2	Motor NP FLA	3.7000	Amps	0x406CCCCD		3.4000	0.1000	3000.0000
3	Motor NP Hertz	50.0000	Hz	0x42480000		50.0000	2.0000	500.0000
4	Motor NP RPM	1380	RPM	1380		1450	1	30000
5	Motor NP Power	0.7500	Hp	0x3F400000		0.7500	0.2500	3500.0000
6	Mtr NP Pwr Units	kW		1		kW	Hp	kW
7	Motor Poles	4	Pole	4		4	2	128
27	Speed Ref A Sel	DPI Port 5		16		Speed Ref 1	Zero Speed	DPI Port 5
28	Speed Ref B Sel	Speed Ref 1		1		Speed Ref 1	Zero Speed	DPI Port 5
29	Jog Speed 1	0.0000	RPM	0x00000000		0.0000	-11040.0000	11040.0000
30	Min Spd Ref Lim	-1380.0000	RPM	0xBF800000		-1725.0000	-11040.0000	11040.0000
31	Max Spd Ref Lim	1380.0000	RPM	0x3F800000		1725.0000	-11040.0000	11040.0000
32	Accel Time 1	10.0000	Sec	0x41200000		10.0000	0.0100	6553.5000
33	Decel Time 1	10.0000	Sec	0x41200000		10.0000	0.0100	6553.5000

Cài đặt thông số

Định mức

Giao tiếp máy tính

Cài đặt chế độ Chạy thử

Cài đặt tốc độ Max và Min

Cài đặt thời gian tăng tốc, giảm tốc

Cài đặt thông số truyền nhận dữ liệu. Vào phần **5-20-COMM-D => Device Parameter**

Tốc độ truyền

Chọn cách điều khiển

Port 5: Device Parameters								
#	Parameter Name	Value	Units	Internal Value	Comment	Default	Min	Max
1	DPI Port	5	5			0	0	7
2	DPI Data Rate	500kbps	1			125kbps	125kbps	500kbps
3	DN Addr Cfg	48	48			63	0	63
4	DN Addr Act	48	48			63	0	63
5	DN Rate Cfg	125kbps		0		Autobaud	125kbps	Autobaud
6	DN Rate Act	125kbps		0		125kbps	125kbps	500kbps
7	Ref / Fdbk Size	32-bit	1			16-bit	16-bit	32-bit
8	Datalink Size	32-bit	1			16-bit	16-bit	32-bit
9	Reset Module	Ready		0		Ready	Ready	Set Defaults
10	Comm Flt Action	Hold Last		3		Fault	Fault	Send Flt Cfg
11	Idle Flt Action	Hold Last		3		Fault	Fault	Send Flt Cfg
12	DN Active Cfg	Switches		0		Switches	Switches	EEPROM
13	DPI I/O Cfg	00000011		3		00000001	00000000	00011111
14	DPI I/O Act	00000011		3		00000001	00000000	00011111
15	Flt Cfg Logic	00000000...		0		000000000000...	000000000000...	111111111111

Trong quá trình động cơ hoạt động có thể giám sát các thông số qua phần mềm DriveExecutive
 Vào phần **Motor Control => Monitoring**

Port 0: Monitoring Group Parameters								
#	Parameter Name	Value	Units	Internal Value	Comment	Default	Min	Max
525	Slip Ratio	0.00	Hz	0		0.00	0.00	327.67
526	Stator Frequency	0.0	%	0		0.0	-800.0	800.0
434	Mtr Vds Base	-2141		-2141		0	-8192	0
435	Mtr Vqs Base	7907		7907		0	0	8192
441	Vds Fdbk Filt	0		0		0	-32767	32767
442	Vqs Fdbk Filt	0		0		0	-32767	32767
497	Vqs Command	0	%	0		0	-200	200
498	Vds Command	0	%	0		0	-200	200
495	Iqs Command	0.0	%	0		0.0	-800.0	800.0
496	Ids Command	0.0	%	0		0.0	-800.0	800.0
499	Trq CurFdbk (Iq)	0.0000	P.U.	0x02C7D030		0.0000	-8.0000	8.0000
489	Flx CurFdbk (Id)	0.0000	P.U.	0x02C53DF0		0.0000	-8.0000	8.0000

Thiết lập cấu hình RSNetWork for DeviceNet

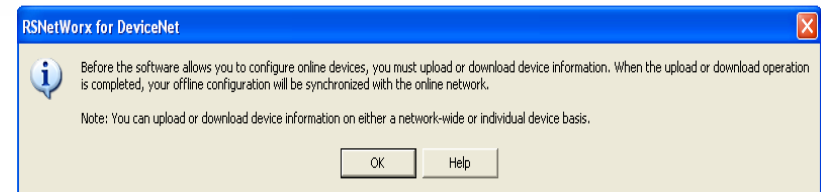
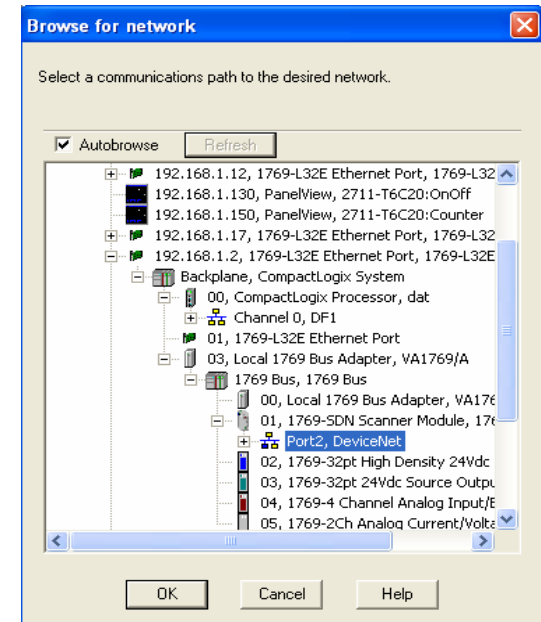
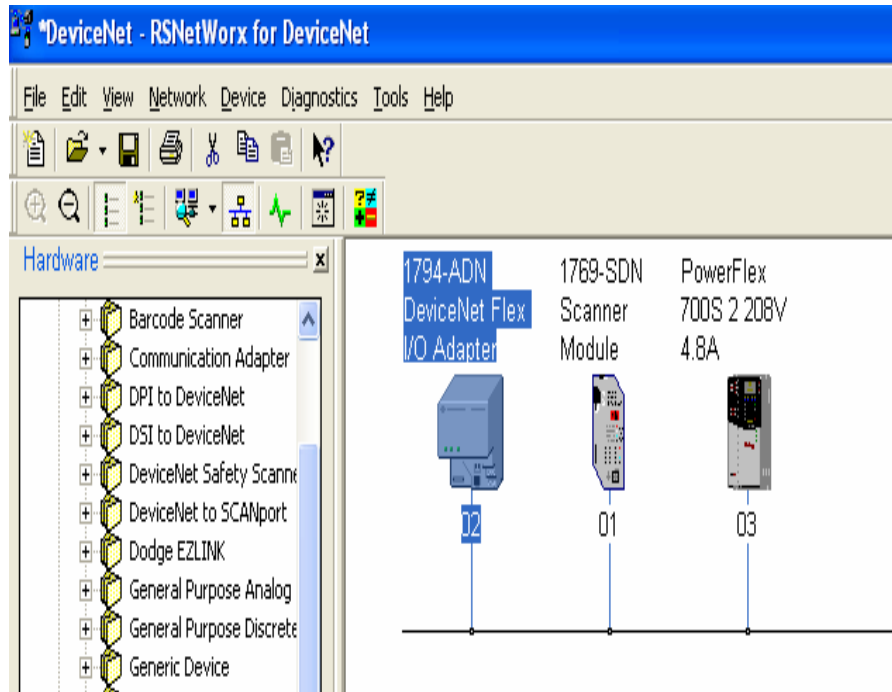
Phần mềm **RSNetWorx for DeviceNet** sẽ dùng để cấu hình vùng địa chỉ và số lượng các byte truyền nhận của Scanner cho biến tần.

Bước 1: Khởi động phần mềm, chọn File New Go Online (để quét tất cả các thiết bị trong mạng). Dẫn tới đường dẫn trên Scanner (Chọn mạng DeviceNet muốn quét) Nhấn OK để xác nhận yêu cầu Upload hoặc Download.



Thiết lập cấu hình RSNetWork for DeviceNet

Sau chu kì quét ta được:

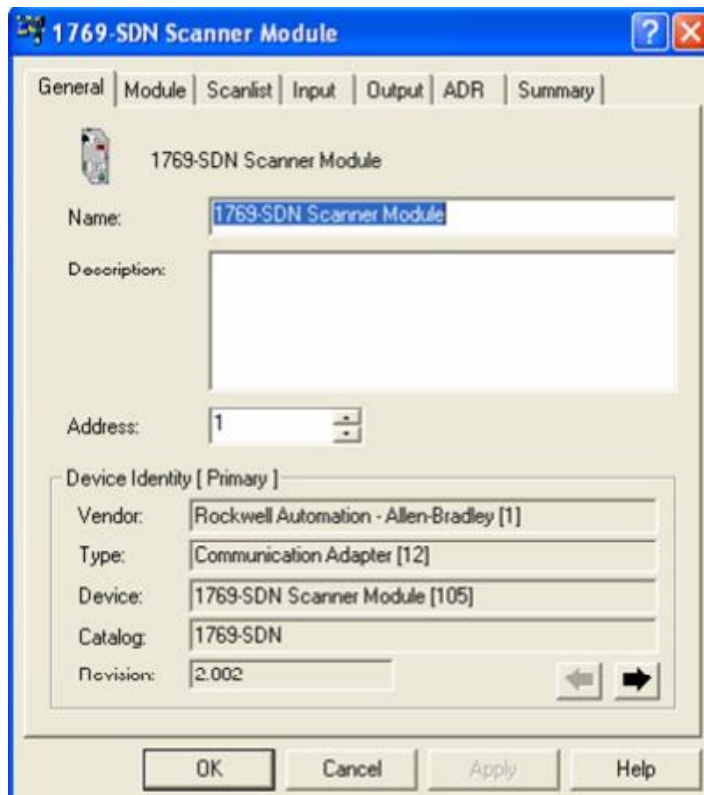


Cần lưu ý là ở ví dụ này biến tần sau khi quét có địa chỉ là 03 là do ta xoay Switch để chọn địa chỉ của Node.

Thiết lập cấu hình RSNetwork for DeviceNet

BƯỚC 2: Cấu hình các ô nhớ truyền nhận:

Click vào Scanner Module, click vào tag Module, bảng thông báo yêu cầu Upload cấu hình hiện tại của các thiết bị xuất hiện,

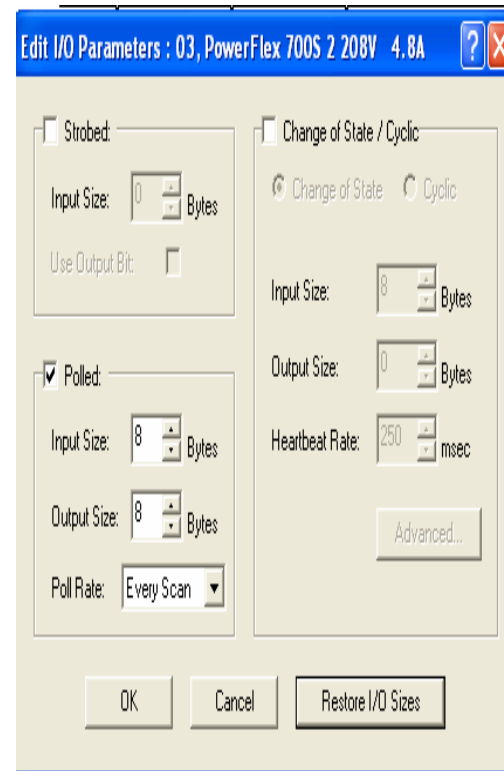
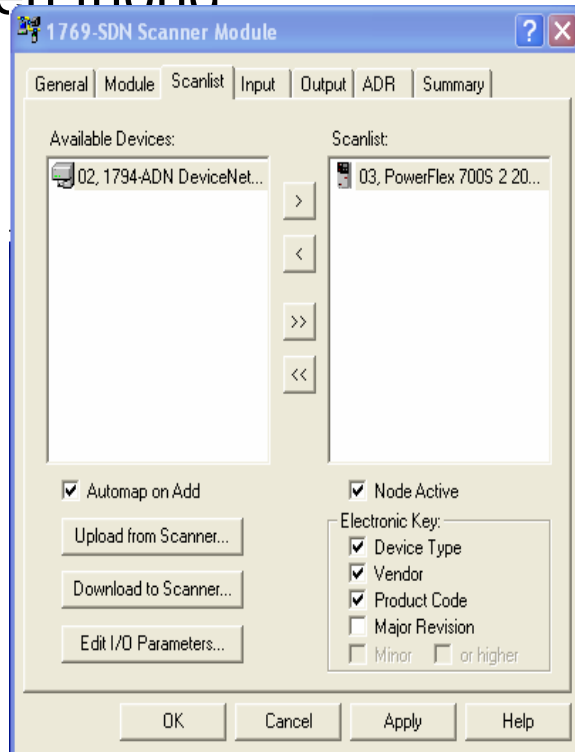


Thiết lập cấu hình RSNetwork for DeviceNet

BƯỚC 2: Cấu hình các ô nhớ truyền nhận:

Click vào tag Scanlist để thấy được tất cả các thiết bị mà

Scanner quét được, đồng thời chọn các thiết bị muốn thiết lập truyền thông



Thiết lập cấu hình RSNetWork for DeviceNet

Click vào Edit I/O Parameters để thay đổi số byte truyền nhận của biến tần, đánh Check chọn kiểu truyền thông là Polled và chọn số byte nhận là 8 bytes và số byte nhận là 8 bytes (DWORD 0 và DWORD 1).

Bảng sau mô tả sự sắp xếp các ô nhớ và chức năng cụ thể của từng ô nhớ , ở đây Output có nghĩa là dữ liệu xuất từ PLC xuống , còn Input là đọc từ Biến tần về.

DWORD	Output I/O
0	Logic Command (LSW)
	Not Used
1	Reference (LSW)
	Reference (MSW)
2	Datalink In A1 (LSW)
	Datalink In A1 (MSW)
3	Datalink In A2 (LSW)
	Datalink In A2 (MSW)
4	Datalink In B1 (LSW)
	Datalink In B1 (MSW)
5	Datalink In B2 (LSW)
	Datalink In B2 (MSW)
6	Datalink In C1 (LSW)
	Datalink In C1 (MSW)
7	Datalink In C2 (LSW)
	Datalink In C2 (MSW)
8	Datalink In D1 (LSW)
	Datalink In D1 (MSW)
9	Datalink In D2 (LSW)
	Datalink In D2 (MSW)

DWORD	Input I/O
0	Logic Status (LSW)
	Not Used
1	Feedback (LSW)
	Feedback (MSW)
2	Datalink Out A1 (LSW)
	Datalink Out A1 (MSW)
3	Datalink Out A2 (LSW)
	Datalink Out A2 (MSW)
4	Datalink Out B1 (LSW)
	Datalink Out B1 (MSW)
5	Datalink Out B2 (LSW)
	Datalink Out B2 (MSW)
6	Datalink Out C1 (LSW)
	Datalink Out C1 (MSW)
7	Datalink Out C2 (LSW)
	Datalink Out C2 (MSW)
8	Datalink Out D1 (LSW)
	Datalink Out D1 (MSW)
9	Datalink Out D2 (LSW)
	Datalink Out D2 (MSW)

Thiết lập cấu hình RSNetWork for DeviceNet

Chức năng của từng bit trong Logic Command Word được mô tả như sau:

Logic Bits																Command	Description																																								
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																										
															x	Normal Stop	0 = Not Normal Stop 1 = Normal Stop																																								
															x	Start ⁽¹⁾	0 = Not Start 1 = Start																																								
														x		Jog 1	0 = Not Jog using [Jog Speed 1] 1 = Jog using [Jog Speed 1]																																								
													x			Clear Fault ⁽²⁾	0 = Not Clear Fault 1 = Clear Fault																																								
										x	x					Unipolar Direction	00 = No Command 01 = Forward Command 10 = Reverse Command 11 = Hold Direction Control																																								
									x							Reserved																																									
								x								Jog 2	0 = Not Jog using [Jog Speed 2] 1 = Jog using [Jog Speed 2]																																								
							x									Current Limit Stop	0 = Not Current Limit Stop 1 = Current Limit Stop																																								
					x											Coast Stop	0 = Not Coast to Stop 1 = Coast to Stop																																								
				x												Reserved																																									
				x												Reserved																																									
			x													Spd Ref Sel0																																									
		x														Spd Ref Sel1																																									
	x															Spd Ref Sel2	<table border="1"> <thead> <tr> <th colspan="3">Bits</th> <th></th> </tr> <tr> <th>14</th><th>13</th><th>12</th><th></th> </tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>0</td><td>= Spd Ref A</td> </tr> <tr> <td>0</td><td>0</td><td>1</td><td>= Spd Ref B</td> </tr> <tr> <td>0</td><td>1</td><td>0</td><td>= Preset 2</td> </tr> <tr> <td>0</td><td>1</td><td>1</td><td>= Ref. 3 (Preset 3)</td> </tr> <tr> <td>1</td><td>0</td><td>0</td><td>= Ref. 4 (Preset 4)</td> </tr> <tr> <td>1</td><td>0</td><td>1</td><td>= Ref. 5 (Preset 5)</td> </tr> <tr> <td>1</td><td>1</td><td>0</td><td>= Ref. 6 (Preset 6)</td> </tr> <tr> <td>1</td><td>1</td><td>1</td><td>= Ref. 7 (Preset 7)</td> </tr> </tbody> </table>	Bits				14	13	12		0	0	0	= Spd Ref A	0	0	1	= Spd Ref B	0	1	0	= Preset 2	0	1	1	= Ref. 3 (Preset 3)	1	0	0	= Ref. 4 (Preset 4)	1	0	1	= Ref. 5 (Preset 5)	1	1	0	= Ref. 6 (Preset 6)	1	1	1	= Ref. 7 (Preset 7)
Bits																																																									
14	13	12																																																							
0	0	0	= Spd Ref A																																																						
0	0	1	= Spd Ref B																																																						
0	1	0	= Preset 2																																																						
0	1	1	= Ref. 3 (Preset 3)																																																						
1	0	0	= Ref. 4 (Preset 4)																																																						
1	0	1	= Ref. 5 (Preset 5)																																																						
1	1	0	= Ref. 6 (Preset 6)																																																						
1	1	1	= Ref. 7 (Preset 7)																																																						
x																Reserved																																									

Thiết lập cấu hình RSNetWork for DeviceNet

Chức năng của từng bit trong Logic Status Word được mô tả như sau:

Logic Bits																Status	Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
															x	Active	0 = Not Active 1 = Active
															x	Running	0 = Not Running 1 = Running
															x	Command Direction	0 = Reverse 1 = Forward
															x	Actual Direction	0 = Reverse 1 = Forward
															x	Accel	0 = Not Accelerating 1 = Accelerating
															x	Decel	0 = Not Decelerating 1 = Decelerating
															x	Jogging	0 = Not Jogging 1 = Jogging
															x	Fault	0 = No Fault 1 = Fault
															x	Alarm	0 = No Alarm 1 = Alarm
															x	Flash Mode	0 = Not in Flash Mode 1 = In Flash Mode
															x	Run Ready	0 = Not Ready to Run 1 = Ready to Run
															x	At Limit ⁽¹⁾	0 = Not At Limit 1 = At Limit
															x	Tach Loss Sw	0 = Not Tach Loss Sw 1 = Tach Loss Sw
															x	At Zero Spd	0 = Not At Zero Speed 1 = At Zero Speed
															x	At Setpt Spd	0 = Not At Setpoint Speed 1 = At Setpoint Speed
															x	Enabled	0 = Not Enabled 1 = Enabled

Như vậy, việc điều khiển các chức năng cơ bản giờ đây được thực hiện bằng cách tác động lên từng bit.

Thiết lập cấu hình RSNetWork for DeviceNet

Việc cần làm tiếp theo là tốc độ tham chiếu cho động cơ:

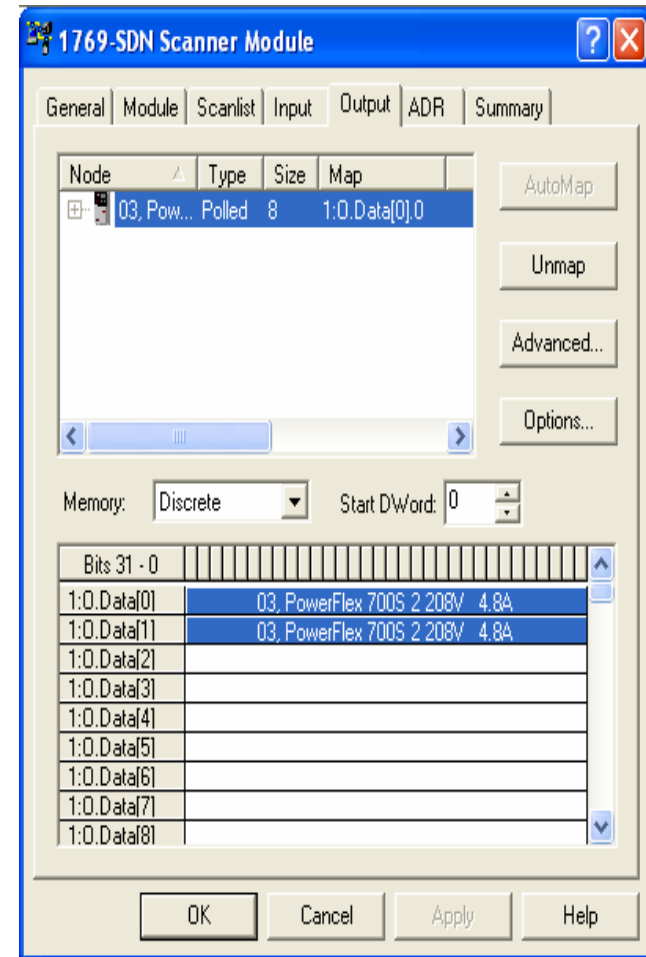
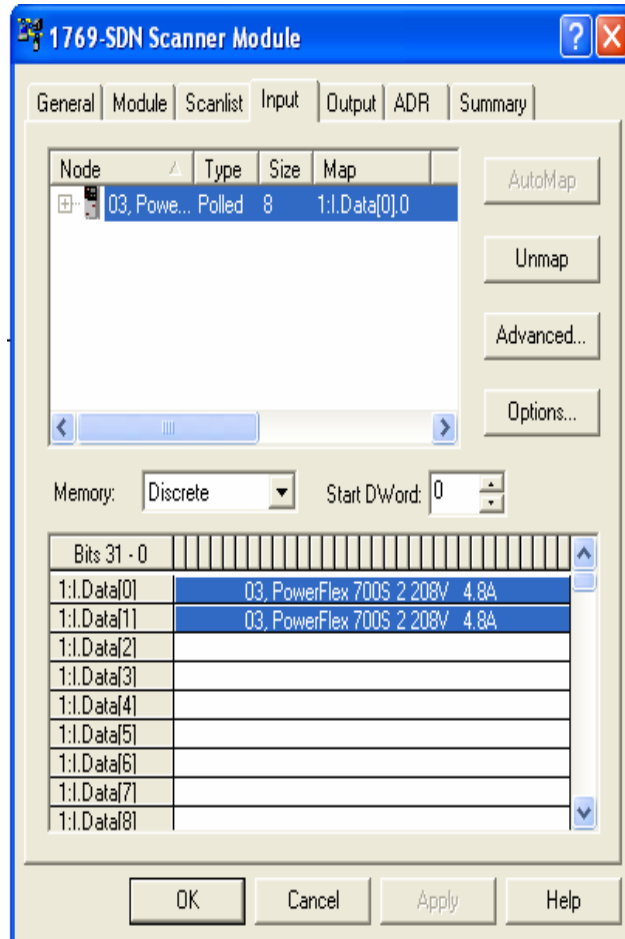
Giá trị mặc định của Par 07 [Ref / Fdbk size] là 16 bit, do vậy giá trị số lớn nhất có thể ghi vào Dword Reference là 32767; giá trị số lớn nhất này tương ứng với giá trị chứa trong Par 31 [Max Spd Ref Lim], do vậy ta muốn đặt tốc độ tham chiếu cho động cơ thì chỉ cần thực hiện phép tam suất đơn giản như sau:

Max Spd Ref Lim ----- 32767

Speed_Reference ----- Giá trị số (ghi vào Dword 1
Output I/O)

Thiết lập cấu hình RSNetWork for DeviceNet

BƯỚC 3: Xem chi tiết các vùng nhớ vào ra:



Thiết lập cấu hình RSNetWork for DeviceNet

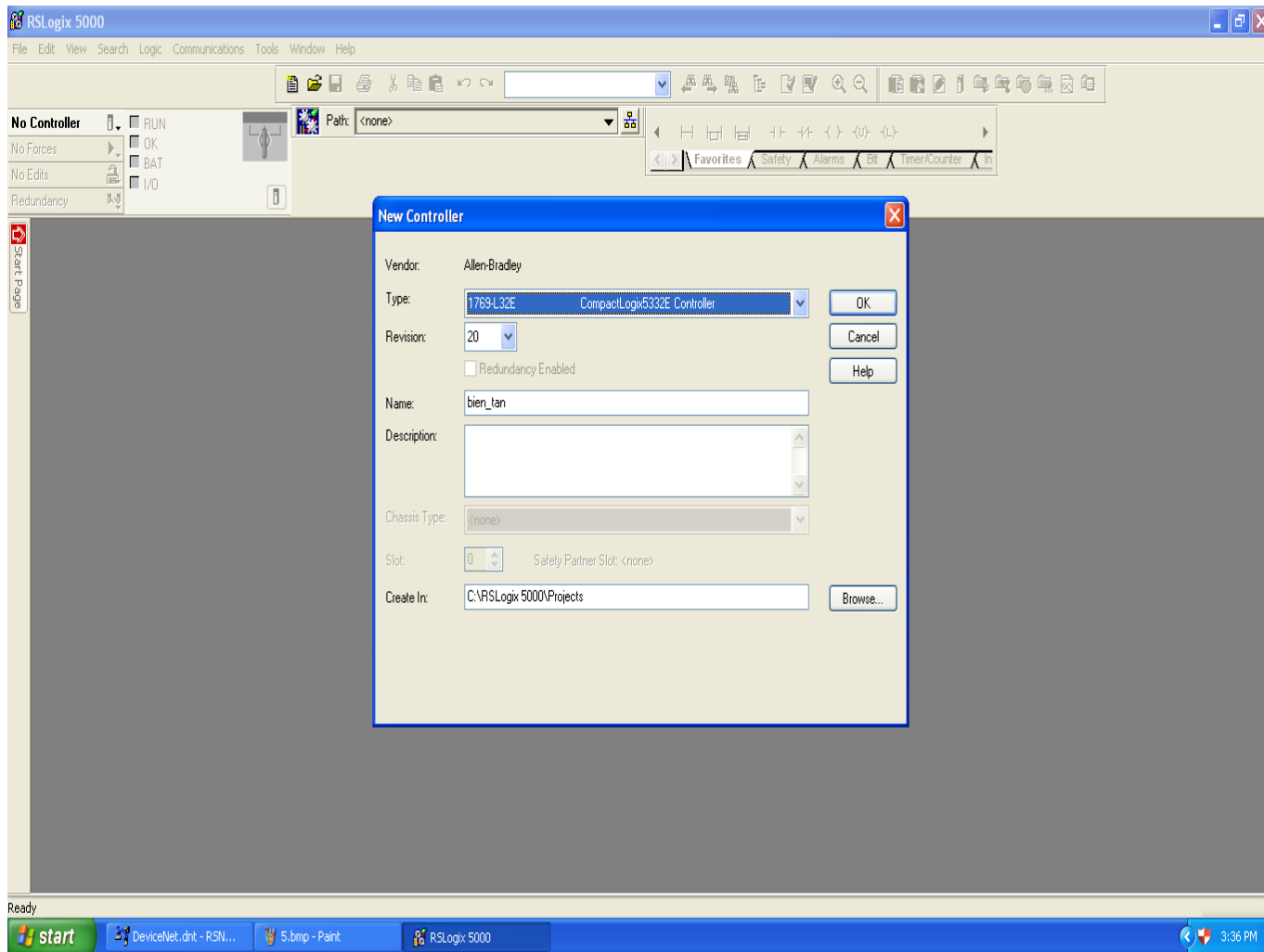
Bước 3: Xem chi tiết các vùng nhớ vào ra:

Tại vùng nhớ ngõ vào Input : LSW của Dword 1:I:Data[0] là Logic Status Word , MSW của Dword này không sử dụng. Tiếp theo LSW của Dword 1:I:Data[1] là giá trị Feedback , với giá trị Feedback này có thể tính được giá trị tốc độ (tần số) hiện tại của biến tần.

Tại vùng nhớ ngõ ra Output: LSW của Dword 1:O:Data[0] là Command Logic Word , MSW này không sử dụng. Tiếp theo LSW của Dword 1:O:Data[1] là giá trị Reference , có thể đặt tốc độ tham chiếu cho biến tần bằng cách ghi giá trị số tương ứng vào Word này

Khởi tạo phần cứng Compactlogix 5000

Chọn Compactlogix 1769-L32E trong mục New Controller



Khởi tạo phần cứng Compactlogix 5000

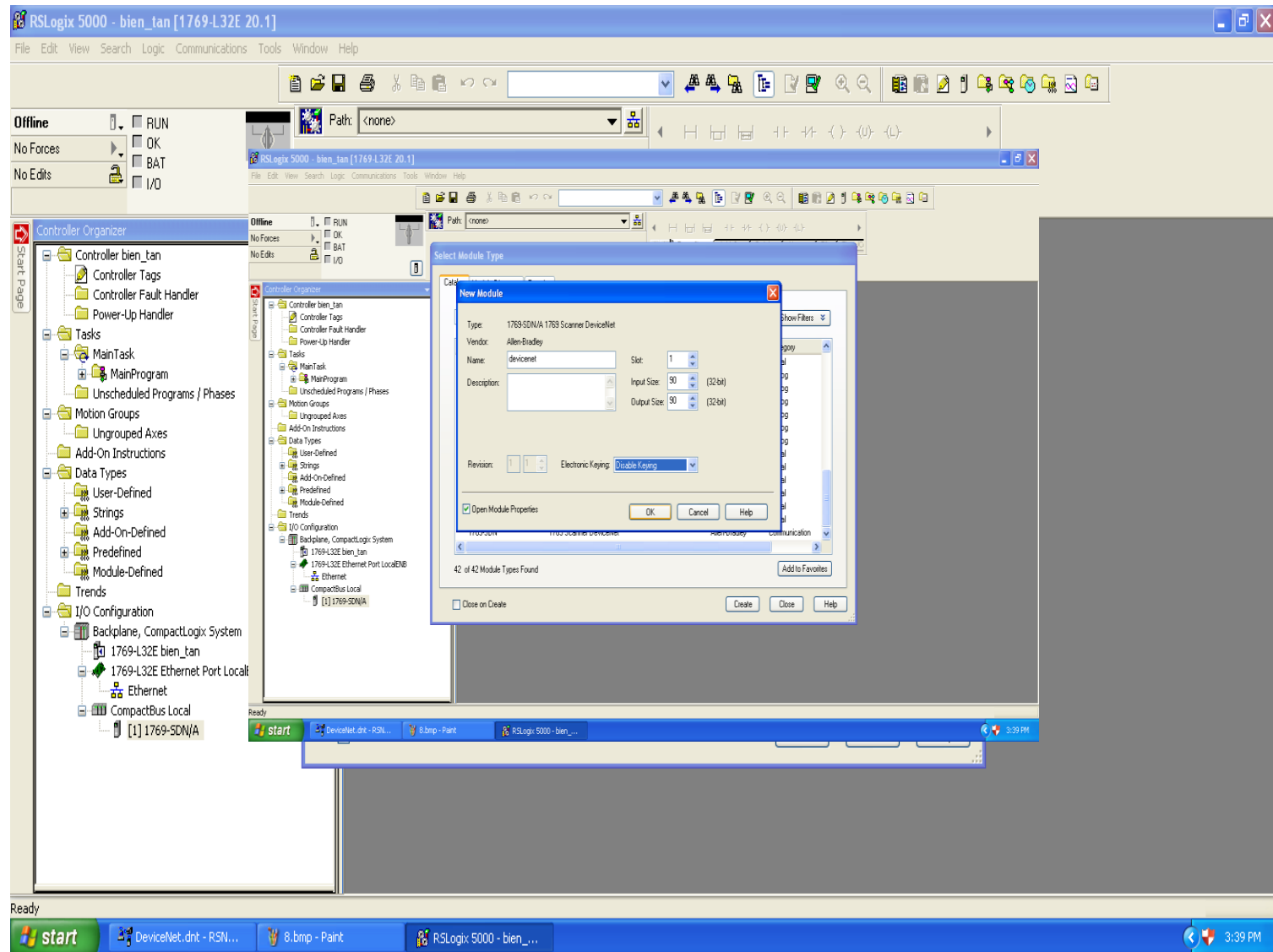
Tạo module mở rộng 1769-SDN.

Chọn **CompactBus Local** => **New Module**

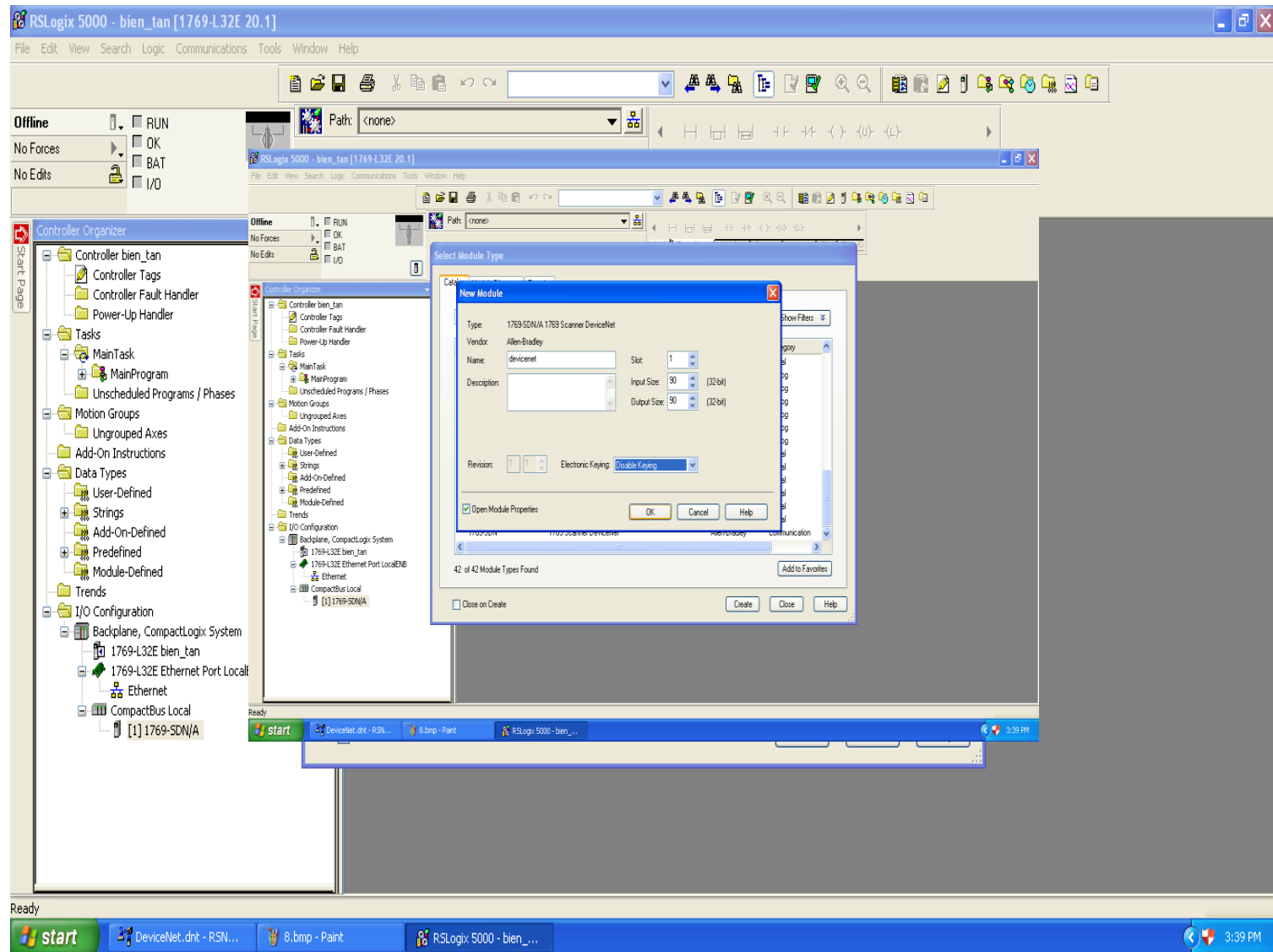
The screenshot shows the RSLogix 5000 software interface. The 'Controller Organizer' on the left shows the project structure, with 'CompactBus Local' selected under 'I/O Configuration'. The 'Select Module Type' dialog box is open, displaying a list of module types. The '1769-SDN' module is selected, which is a 1769 Scanner DeviceNet module from Allen-Bradley, categorized as Communication. The dialog box also shows a search bar, 'Clear Filters', 'Show Filters', and 'Add to Favorites' buttons. The status bar at the bottom indicates 'Ready' and the system tray shows the time as 3:39 PM.

Catalog Number	Description	Vendor	Category
1769-OB8	8 Point High Current 24V DC Output	Allen-Bradley	Digital
1769-OF2	2 Channel Current/Voltage Analog Output	Allen-Bradley	Analog
1769-OF4	4 Channel Current/Voltage Analog Output	Allen-Bradley	Analog
1769-OF4CI	4 Channel Isolated Analog Current Output	Allen-Bradley	Analog
1769-OF4VI	4 Channel Isolated Analog Voltage Output	Allen-Bradley	Analog
1769-OF8C	8 Channel Single Ended Current Analog Output	Allen-Bradley	Analog
1769-OF8V	8 Channel Single Ended Voltage Analog Output	Allen-Bradley	Analog
1769-OG16	16 Point 0V-5.5V DC TTL Output	Allen-Bradley	Digital
1769-OV16	16 Point 24V DC Output, Sink	Allen-Bradley	Digital
1769-OV32T	32 Point High Density 24V DC Output, Sink	Allen-Bradley	Digital
1769-OW16	16 Point AC/DC Relay Output	Allen-Bradley	Digital
1769-OW8	8 Point AC/DC Relay Output	Allen-Bradley	Digital
1769-OW8I	8 Point Isolated AC/DC Relay Output	Allen-Bradley	Digital
1769-SDN	1769 Scanner DeviceNet	Allen-Bradley	Communication

Khởi tạo phần cứng Compactlogix 5000



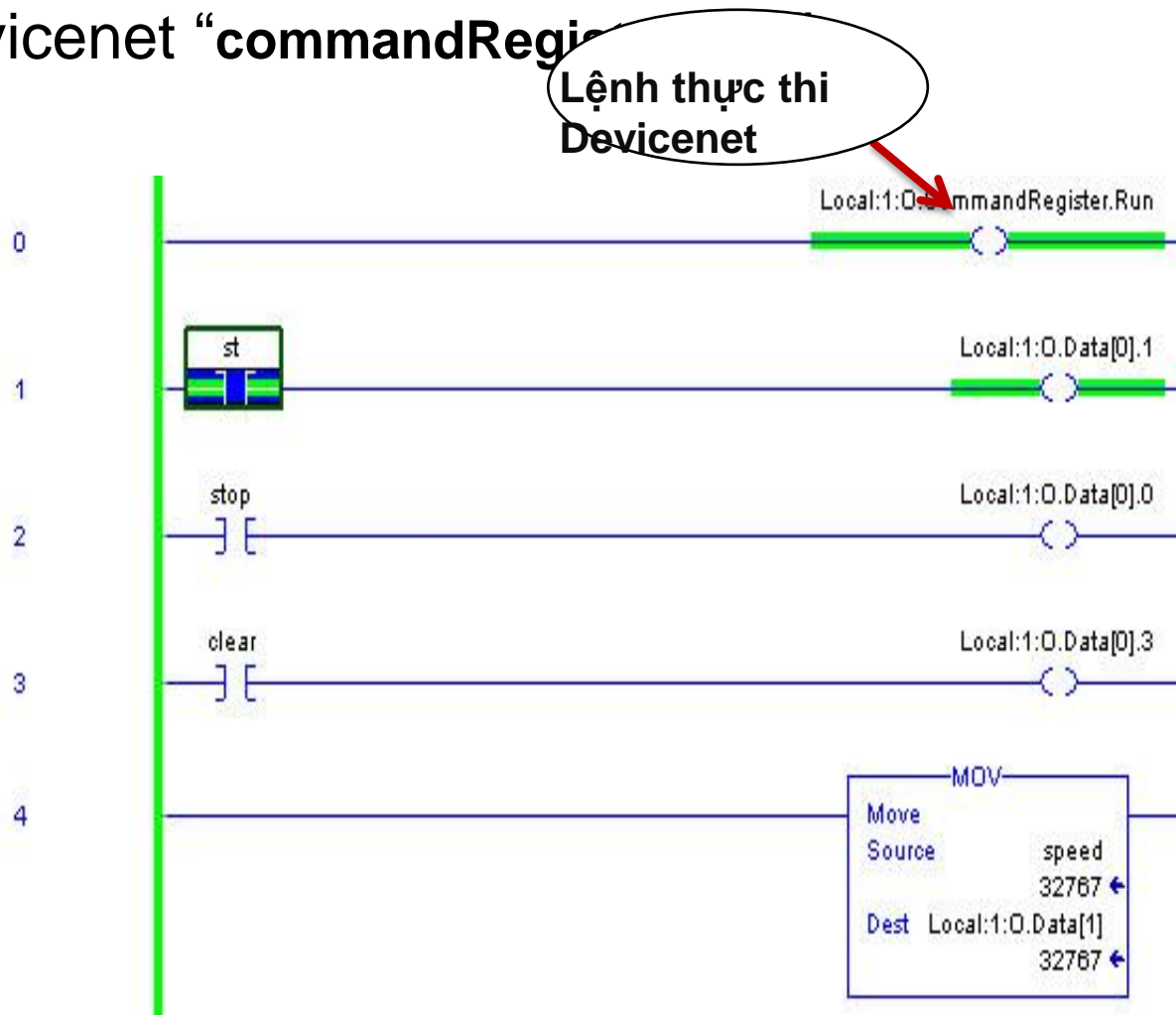
Khởi tạo phần cứng Compactlogix 5000



Khởi tạo Compactlogix 5000

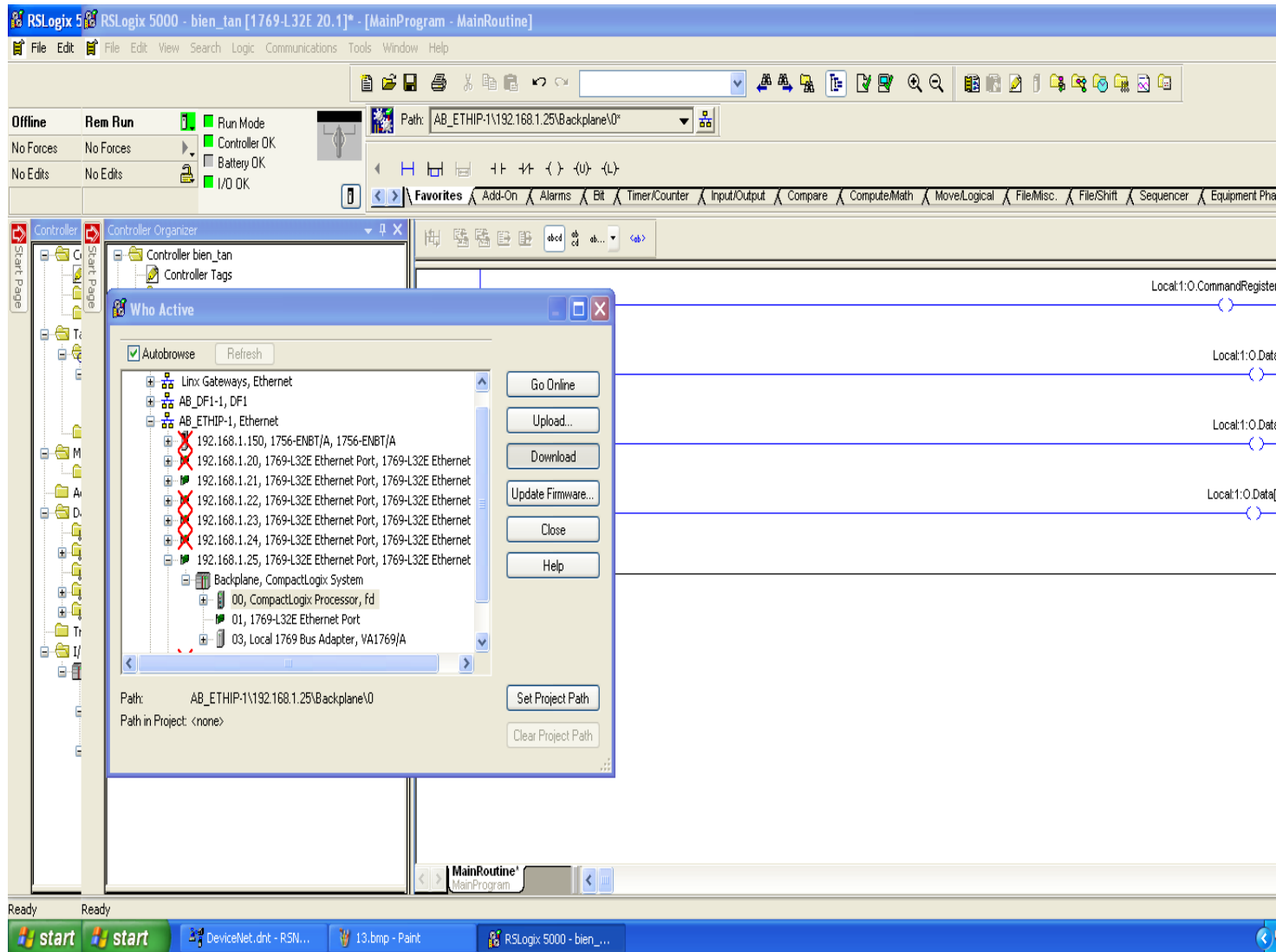
Ta vào MainRoutine viết chương trình Start, Stop, Clear và gán giá trị tốc độ xuống động cơ.

- ❖ **Lưu ý**: Để điều khiển được biến tần cần có lệnh thực thi Devicenet “commandRegister.Run”



Khởi tạo Compactlogix 5000

Vào **Communications** => **Who Active** để Download..



DATALINK

- ❖ DATALINK là vùng bổ sung chức năng giám sát và điều khiển các thông số của biến tần từ SCADA và PLC.
- ❖ Có 4 vùng DATALINK chính là A, B, C, D cho Output I/O và Input I/O của biến tần, trong mỗi Datalink lại chia nhỏ thành 2 vùng với qui ước số 1 và 2 đằng sau. Như vậy, mỗi Output và Input I/O của biến tần có tổng cộng 8 vùng DATALINK.

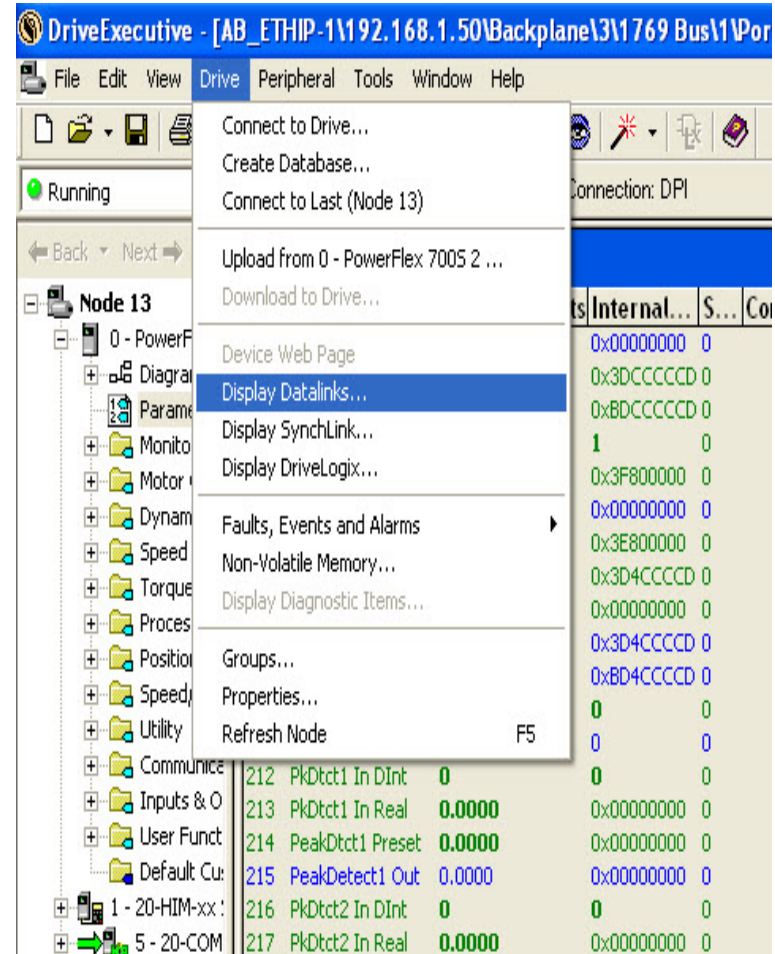
DWORD	Output I/O
0	Logic Command (LSW)
	Not Used
1	Reference (LSW)
	Reference (MSW)
2	Datalink In A1 (LSW)
	Datalink In A1 (MSW)
3	Datalink In A2 (LSW)
	Datalink In A2 (MSW)
4	Datalink In B1 (LSW)
	Datalink In B1 (MSW)
5	Datalink In B2 (LSW)
	Datalink In B2 (MSW)
6	Datalink In C1 (LSW)
	Datalink In C1 (MSW)
7	Datalink In C2 (LSW)
	Datalink In C2 (MSW)
8	Datalink In D1 (LSW)
	Datalink In D1 (MSW)
9	Datalink In D2 (LSW)
	Datalink In D2 (MSW)

DWORD	Input I/O
0	Logic Status (LSW)
	Not Used
1	Feedback (LSW)
	Feedback (MSW)
2	Datalink Out A1 (LSW)
	Datalink Out A1 (MSW)
3	Datalink Out A2 (LSW)
	Datalink Out A2 (MSW)
4	Datalink Out B1 (LSW)
	Datalink Out B1 (MSW)
5	Datalink Out B2 (LSW)
	Datalink Out B2 (MSW)
6	Datalink Out C1 (LSW)
	Datalink Out C1 (MSW)
7	Datalink Out C2 (LSW)
	Datalink Out C2 (MSW)
8	Datalink Out D1 (LSW)
	Datalink Out D1 (MSW)
9	Datalink Out D2 (LSW)
	Datalink Out D2 (MSW)

Giám sát quá trình hoạt động của biến tần

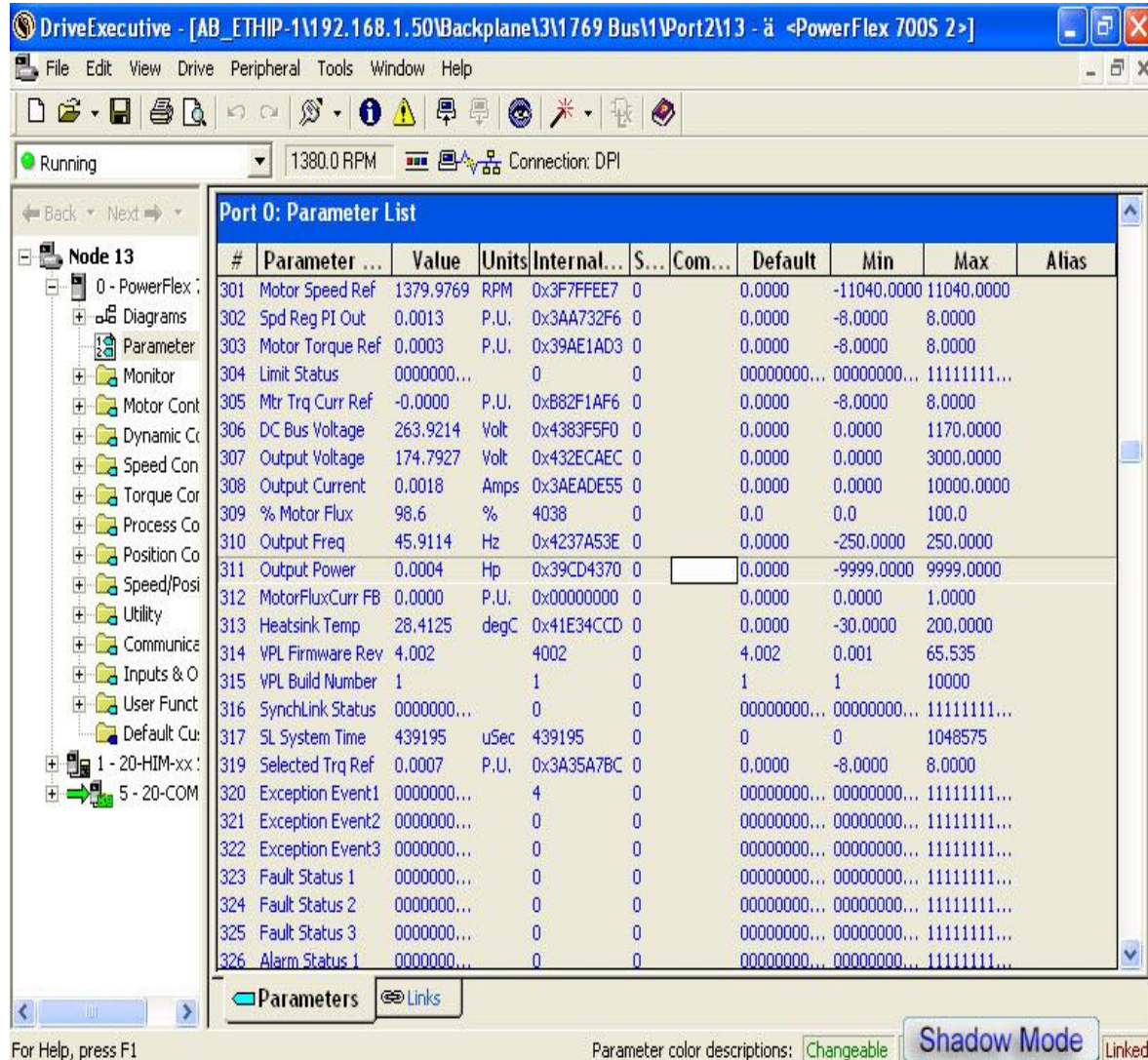
Để cấu hình cho việc đưa thông số nào từ biến tần lên phần mềm RSLogix 5000 để hiển thị

Vào **Driver** => **Display Datalink**



Giám sát quá trình hoạt động của biến tần

Các thông số feedback trong quá trình hoạt động của động cơ thuộc vùng Parameter 300 trở lên. Để chọn thông số cần giám sát cho Datalink vào **Diagrams** => **Parameter**



The screenshot shows the DriveExecutive software interface. The main window displays the 'Port 0: Parameter List' for a PowerFlex 700S 2 motor. The interface includes a menu bar (File, Edit, View, Drive, Peripheral, Tools, Window, Help), a toolbar, and a status bar. The parameter list is as follows:

#	Parameter ...	Value	Units	Internal...	S...	Com...	Default	Min	Max	Alias
301	Motor Speed Ref	1379.9769	RPM	0x3F7FEE7	0		0.0000	-11040.0000	11040.0000	
302	Spd Reg PI Out	0.0013	P.U.	0x3AA732F6	0		0.0000	-8.0000	8.0000	
303	Motor Torque Ref	0.0003	P.U.	0x39AE1AD3	0		0.0000	-8.0000	8.0000	
304	Limit Status	0000000...		0	0		00000000...	00000000...	11111111...	
305	Mtr Trq Curr Ref	-0.0000	P.U.	0xB82F1AF6	0		0.0000	-8.0000	8.0000	
306	DC Bus Voltage	263.9214	Volt	0x4383F5F0	0		0.0000	0.0000	1170.0000	
307	Output Voltage	174.7927	Volt	0x432ECAEC	0		0.0000	0.0000	3000.0000	
308	Output Current	0.0018	Amps	0x3AEADE55	0		0.0000	0.0000	10000.0000	
309	% Motor Flux	98.6	%	4038	0		0.0	0.0	100.0	
310	Output Freq	45.9114	Hz	0x4237A53E	0		0.0000	-250.0000	250.0000	
311	Output Power	0.0004	Hp	0x39CD4370	0		0.0000	-9999.0000	9999.0000	
312	MotorFluxCurr FB	0.0000	P.U.	0x00000000	0		0.0000	0.0000	1.0000	
313	Heatsink Temp	28.4125	degC	0x41E34CCD	0		0.0000	-30.0000	200.0000	
314	VPL Firmware Rev	4.002		4002	0		4.002	0.001	65.535	
315	VPL Build Number	1		1	0		1	1	10000	
316	SynchLink Status	0000000...		0	0		00000000...	00000000...	11111111...	
317	SL System Time	439195	uSec	439195	0		0	0	1048575	
319	Selected Trq Ref	0.0007	P.U.	0x3A35A7BC	0		0.0000	-8.0000	8.0000	
320	Exception Event1	0000000...		4	0		00000000...	00000000...	11111111...	
321	Exception Event2	0000000...		0	0		00000000...	00000000...	11111111...	
322	Exception Event3	0000000...		0	0		00000000...	00000000...	11111111...	
323	Fault Status 1	0000000...		0	0		00000000...	00000000...	11111111...	
324	Fault Status 2	0000000...		0	0		00000000...	00000000...	11111111...	
325	Fault Status 3	0000000...		0	0		00000000...	00000000...	11111111...	
326	Alarm Status 1	0000000...		0	0		00000000...	00000000...	11111111...	

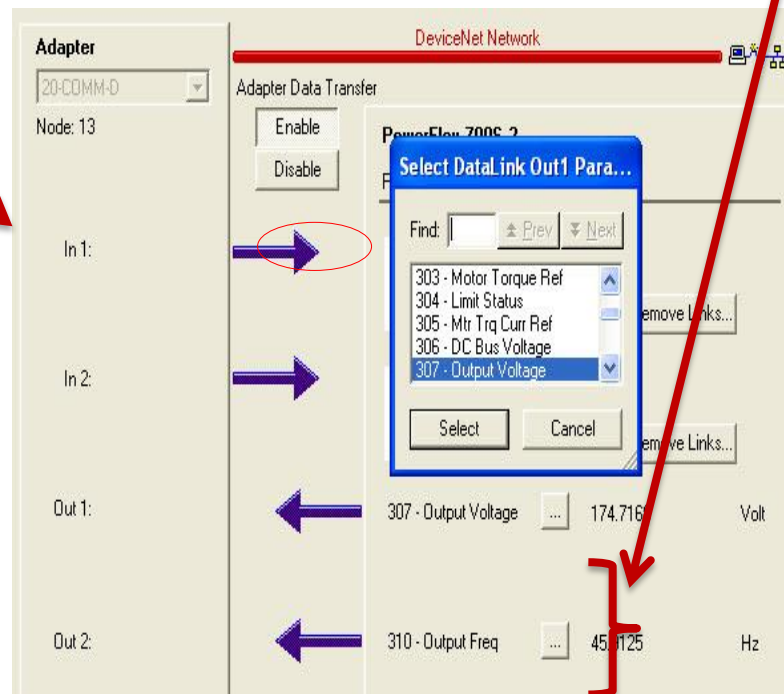
Giám sát quá trình hoạt động của biến tần

Các vùng để link dữ liệu feedback về (tham khảo slide 25) tùy theo mục đích sử dụng và yêu cầu chọn cho phù hợp.

Ví dụ sử dụng vùng Datalink A hồi tiếp Parameter 307 (ngõ ra điện áp) và 310 (ngõ ra tần số)

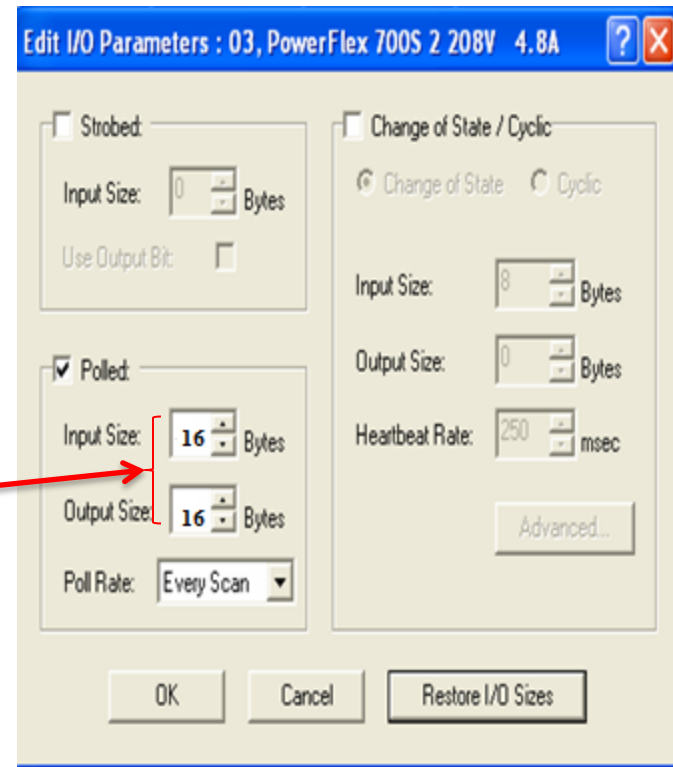
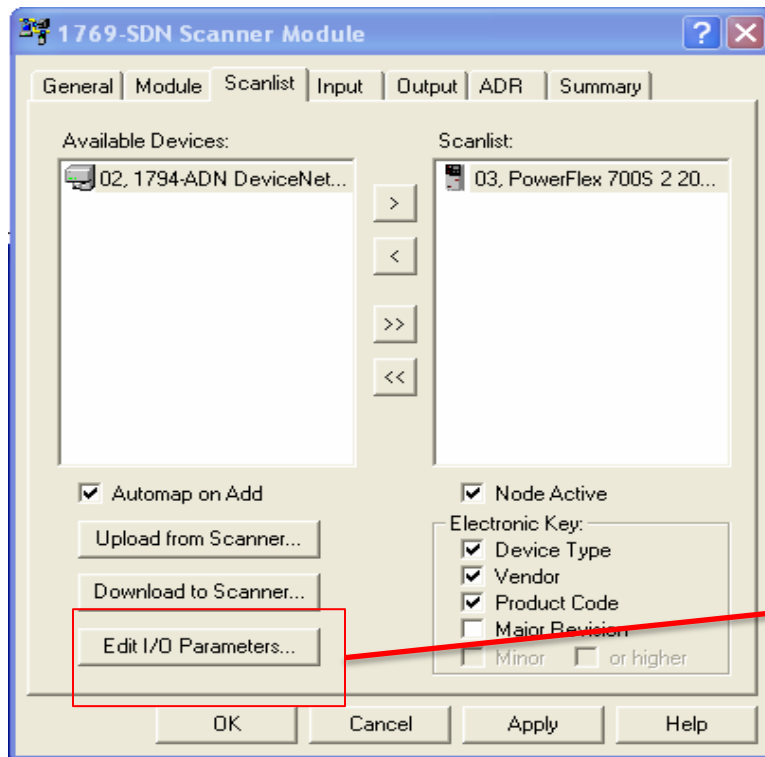


Lựa chọn giá trị cần hồi tiếp về



Giám sát quá trình hoạt động của biến tần

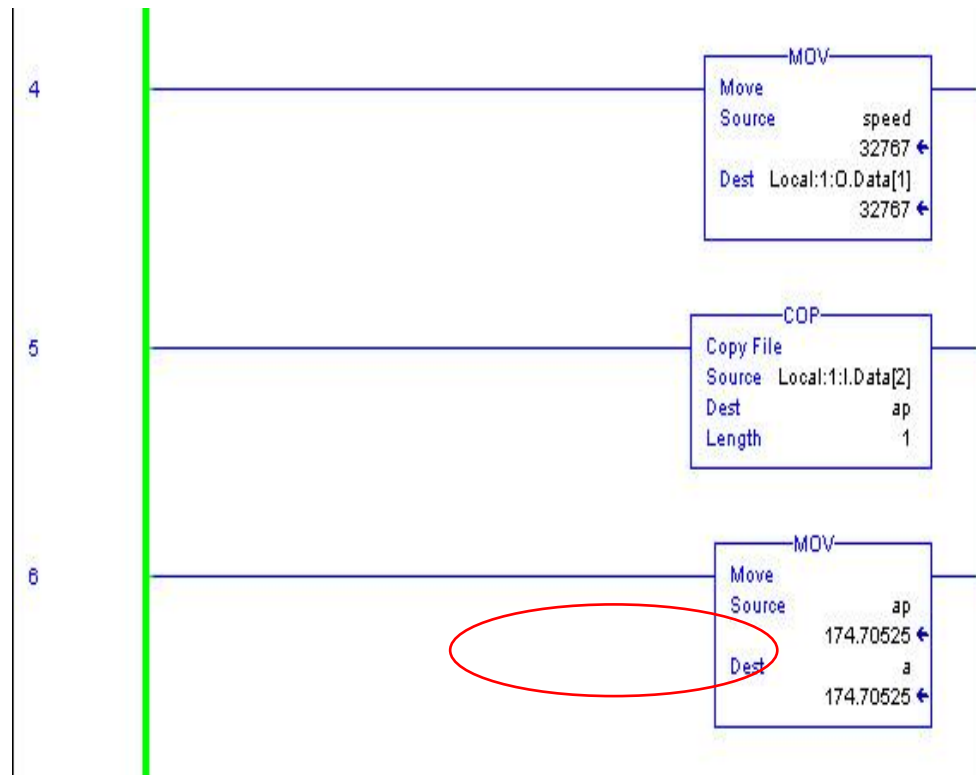
Vào phần Edit I/O Parameters cài đặt kích thước dữ liệu vào ra. Chú ý khi dùng Datalink hồi tiếp dữ liệu về dữ liệu vào ra phải là 16 bytes. Sau đó Download to Scanner.



Giám sát quá trình hoạt động của biến tần

Đưa dữ liệu lên chương trình điều khiển để dễ dàng giám sát và kiểm tra.

Dùng lệnh **COP** để copy dữ liệu của thông số cần feedback đồng thời để chuyển đổi kiểu dữ liệu từ DINT (*kiểu giao tiếp mạng*) trở về REAL (*kiểu dữ liệu của biến tần*), sau đó dùng lệnh **MOV** hiện thị dữ liệu feedback đưa về.



Giám sát quá trình hoạt động của biến tần

Để giám sát biết được trạng thái hoạt động của động cơ trong quá trình làm việc có đúng như các thông số đã cài đặt trước hay các sự cố xảy ra để có biện pháp xử lý kịp thời.

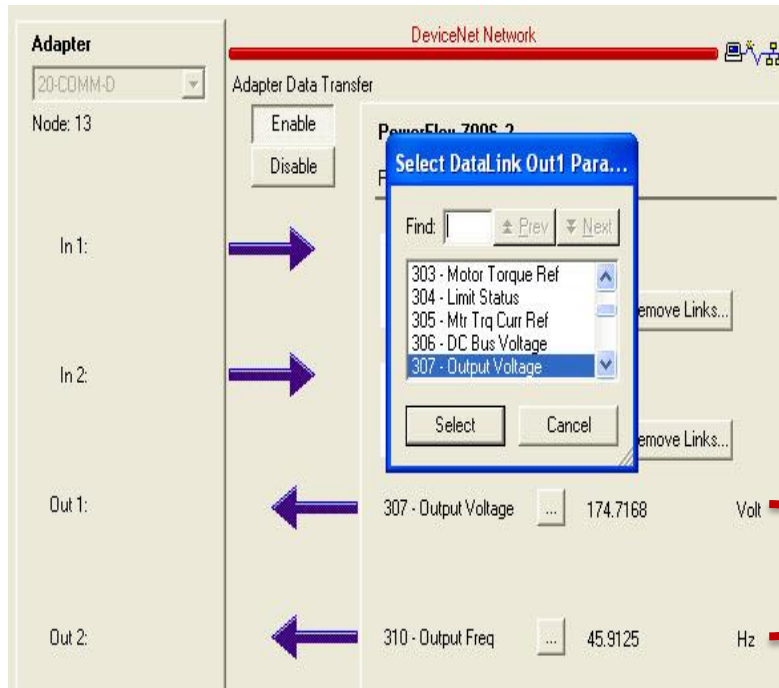
Vào **Driver** => **Display Datalink**

The screenshot shows the DriveExecutive software interface. The 'Drive' menu is open, and 'Display Datalinks...' is highlighted. The interface includes a status bar at the top showing 'Running', a navigation pane on the left for 'Node 13', and a data table on the right.

ts	Internal...	S...	Co	
0x00000000	0			
0x3DCCCCD0	0			
0xBDCCCCD0	0			
1	0			
0x3F800000	0			
0x00000000	0			
0x3E800000	0			
0x3D4CCCCD0	0			
0x00000000	0			
0x3D4CCCCD0	0			
0xBD4CCCCD0	0			
0	0			
0	0			
212	PkDtct1 In DIInt	0	0	0
213	PkDtct1 In Real	0.0000	0x00000000	0
214	PeakDtct1 Preset	0.0000	0x00000000	0
215	PeakDetect1 Out	0.0000	0x00000000	0
216	PkDtct2 In DIInt	0	0	0
217	PkDtct2 In Real	0.0000	0x00000000	0

Giám sát quá trình hoạt động của biến tần

Check dữ liệu từ DATALINK của biến tần đã hội tiếp chính xác giá trị với RSLogix 5000?



Giá trị hội tiếp