

# **Remote Chassis**

using ControlLogix Ethernet Modules



# Student Materials for Lab Exercise 5: Remote Chassis

# Lesson Objective

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

- 1. Explain basic set-up of Ethernet Communication Modules
- 2. Understand ControlLogix set-up for projects using remote chassis.
- 3. Understand module tags on a remote chassis.

Page

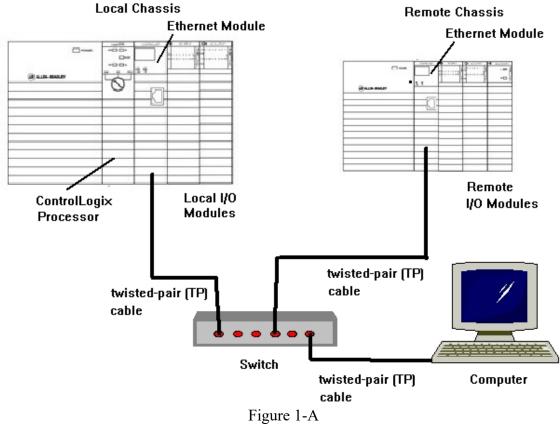
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## Introduction:

Allen Bradley ControlLogix PLC Systems can be as simple as a processor monitoring /controlling I/O across a chassis backplane (Local Chassis) or more complex with processors monitoring / controlling I/O and other devices (VFDs, HIMs) over communication networks (Remote Chassis) such as Ethernet, ControlNet, DeviceNet, DH+, Remote I/O and others.

This lesson will cover the basic set-up of a ControlLogix remote chassis, to allow a ControlLogix processor to monitor / control I/O in a chassis via Ethernet communications



Basic Remote Chassis Configuration

Local Chassis – Chassis with ControlLogix processor, Communication Modules, Power Supply and I/O Modules (Local I/O)

Remote Chassis – Chassis with Communication Module, Power Supply and I/O Modules (Remote I/O) Note: Remote Chassis could contain a processor



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Switch – Ethernet connection point for Computer, Local Ethernet Module and Remote Ethernet Module.

Computer – Studio 5000 software, RSLinx software, Ethernet Port, Windows 7 OS Cabling - twisted-pair

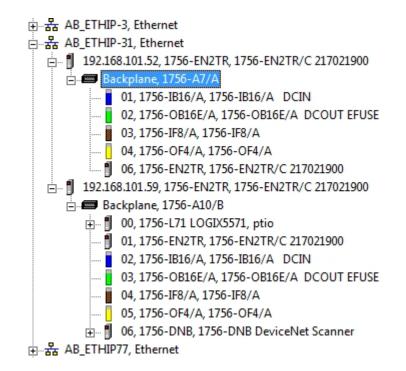
Note: Computer and the 2 Ethernet modules must have the same Network ID Computer and the 2 Ethernet modules must have different Device (Host) IDs

2 Demo units - 1756-L71 processors version 24 1756-EN2TR or 1756-ENBT Ethernet communication modules Discrete I/O Modules

### **Remote Chassis Set-up**

- 1. Determine the IP Address and Subnet Mask information for the computer IP Address:\_\_\_\_\_\_ Subnet Mask: \_\_\_\_\_\_
- 2. With RSLinx verify that there is a connection to each of the Ethernet Modules

Note: Both Ethernet modules must have the same Network ID as the computer Both Ethernet modules must have the same Network (Subnet) Mask as the computer





#### Figure 2-A - RSLinx RSWho Screen Ethernet Connection

In this example the chassis that contain the 1756-EN2TR module with the IP address of 192.168.101.59 is the local chassis. 1756-L71 processor located in slot 0.

In this example the chassis that contain the 1756-EN2TR module with the IP address of 192.168.101.52 is the remote chassis. No ControlLogix processor in chassis.

- 3. Using the Project File Module\_2\_Remote\_Chassis.L5K, Import in to Studio 5000.
- 4. Navigate to and expand the I/O Configuration folder.

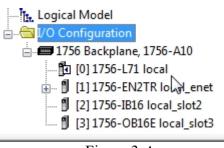
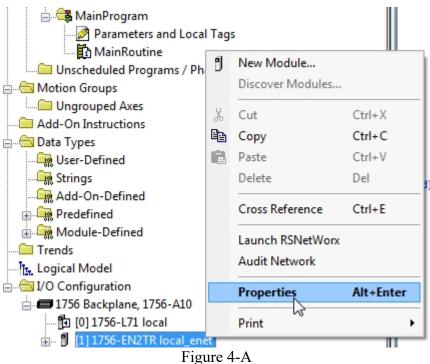


Figure 3-A I/ O Configuration Folder

5. Open the Properties window for the 1756-EN2TR Ethernet module.





Navigate to 1756-EN2TR Properties

6. View General tab Information See Figure 5-A



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General Conne	ection RSNetWorx Module Info Internet Protoc	ol Port Configuration Network Time Sync
Type: Vendor: Parent: Name: Description:	1756-EN2TR 1756 10/100 Mbps Ethemet Bridge. Allen-Bradley Local	2-Port, Twisted-Pair Media Change Type ← Ethemet Address Private Network: 192.168.1. IP Address: 192 . 168 . 101 . 122 Host Name:
Module Defir Revision: Electronic Ke Connection: Time Sync C	Change 10.7 eying: Compatible Module None	Slot: 1
Status: Offline		OK Cancel Apply Help

Figure 5-A

1756-EN2TR Properties – General Tab

Verify the following configuration settings:

Type: Match actual module's Part Number

Parent: Local – Module in the same chassis as processor

Name: Module name – user defined

IP Address: Must match to module's actual IP address

If address does not match change either module's IP address to match the

IP Address setting on General tab or change the IP Address setting on the

General tab to match the actual IP address of the module.

Slot: Must match the actual slot location of module

Electronic Keying: Based in module's revision

7. Navigate back to I/O Configuration folder on the Controller Organizer window



🛓 🖓 🔄 I/O Co	nfiguration
in 🗖 175	i6 Backplane, 1756-A10
···· 🗗	[0] 1756-L71 local
÷. 1	[1] 1756-EN2TR local_enet
31	[2] 1756-IB16 local_slot2
1	[3] 1756-OB16E local_slot3

Figure 6-A. How to expand the information on the Ethernet module.

8. Click the plus (+) sign to the left of the local Ethernet module,

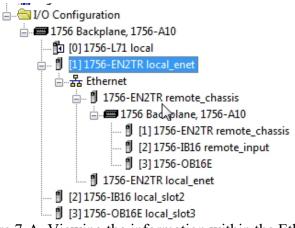


Figure 7-A. Viewing the information within the Ethernet.

The information listed under [1] 1756-EN2TR local\_enet is the configuration information for the remote chassis.

Remote Chassis (Backplane) is a 10 slot chassis - 1756-A10

In slot 1 of the remote chassis is the remote communication module – [1] 1756-EN2TR remote\_chassis

In slot 2 of the remote chassis is an 16 point input module – [2] 1756-IB16 remote\_input

In slot 3 of the remote chassis is an 16 point output module – [3] 1756-OB16E

This information must match the modules' location in the remote chassis.

9. Right click [1] 1756-EN2TR remote\_chassis to open its Properties window



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	-	New Module		Þ
👜 🔤 Predefined		Discover Modules		L
🗄 🔙 Module-Defined				ļ
🛅 Trends	X	Cut	Ctrl+X	h
Logical Model	Đ	Сору	Ctrl+C	Γ
🗄 🗝 🖅 I/O Configuration	R	Paste	Ctrl+V	L
🚍 🛲 1756 Backplane, 1756-A10		Delete	Del	L
🔁 [0] 1756-L71 local				L
🚊 🛯 🖞 [1] 1756-EN2TR local_enet		Cross Reference	Ctrl+E	L
🚊 📲 Ethernet				L
🖃 🖞 1756-EN2TR remote_chassis		Properties	Alt+Enter	L
🖮 🛲 1756 Backplane, 1756-A10		Print Review		L
🖞 [1] 1756-EN2TR remote_chass	_	Print		J
🖞 [2] 1756-IB16 remote_input				

Figure 8-A

10. Navigate to General tab for [1] 1756-EN2TR remote\_chassis module.

General Conne	ction Modul	e Info Internet Proto	col Port Configu	ation Network	Time Sync		
Type: Vendor: Parent: Name: Description: Module Defini Revision: Electronic Ke Connection: Time Sync Co Chassis Size	Allen-Bradley local_enet remote_cha ition ying:	ssis	hange	Port, Twisted-Pair Ethernet Addr Private Ne IP Address Host Namu Slot:	ess stwork: 192 s: 192 . 16	Change Type	•
Status: Offline				ОК	Cancel	Apply	Help

Figure 9-A Remote Ethernet Module's Properties Window – General Tab

Verify the following configuration settings:

Type: Match actual module's Part Number

Parent: local\_enet – Name of the Ethernet Communication module in the local chassis Name: Module name – user defined

IP Address: Must match to module's actual IP address

If address does not match change either module's IP address to match the IP Address setting on General tab or change the IP Address setting on the



12. View Controller Tag window.

General tab to match the actual IP address of the module. Slot: Must match the actual slot location of module Electronic Keying: Based in module's revision Chassis Size: Number of Slots in Remote Chassis - must match to actual chassis size Use Change button to modify Chassis Size, Revision and Electronic Keying settings

11. Navigate back to the Controller Organizer window and open Controller Tags window.



Figure 10-A – Controller Tags

cope: 🔁 local 👻 Sho	ow: All Tags		▼ 7.	Enter Name Filte	¥7
Name		Value 🗧	Force Mask 🗧 🗲	Style	Data Type
±-Local:2:C		{}	{}		AB:1756_DI:C:0
		{}	{}		AB:1756_DI:I:0
∓-Local:3:C		{}	{}		AB:1756_DO:C:0
∓-Local:3:I		{}	{}		AB:1756_DO_Fus.
∓-Local:3:0		{}	{}		AB:1756_DO:O:0
+ local_array		{}	{}	Decimal	DINT[10]
+ local_tag1		0		Decimal	DINT
+ local_timer1		{}	{}		TIMER
+-Mess1		{}	{}		MESSAGE
+-Mess2		{}	{}		MESSAGE
+ remote_chassis:2:C		{}	{}		AB:1756_DI:C:0
+ remote_chassis:2:I		{}	{}		AB:1756_ENET
+ remote_chassis:3:C		{}	{}		AB:1756_DO:C:0
+ remote_chassis:3:I		{}	{}		AB:1756_ENET
+ remote_chassis:3:0		{}	{}		AB:1756_ENET
+ remote_chassis:l		{}	{}		AB:1756_ENET
+ remote_chassis:0		{}	{}		AB:1756_ENET

Figure 11-A –Controller Tags

Tags that begin with the term Local are I/O tags for I/O modules located in the Local Chassis.



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Tags that begin with the term remote\_chassis are I/O tags for I/O modules located in a Remote Chassis.

What is the Name of the 1756-EN2TR Ethernet module located in the Remote Chassis?

Note: I/O tags for remote chassis I/O modules begin with the Name of the communication module in the Remote Chassis.

For example – remote\_chassis:2:I tags – refers to the input module in slot 2 of the remote chassis.

remote\_chassis:3:O tags – refers to the output module in slot 3 of the remote chassis.

13. Navigate to the Ladder Logic screen – MainRoutine.

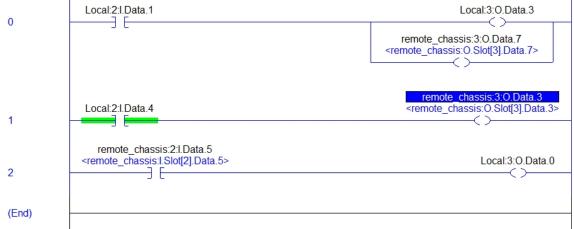


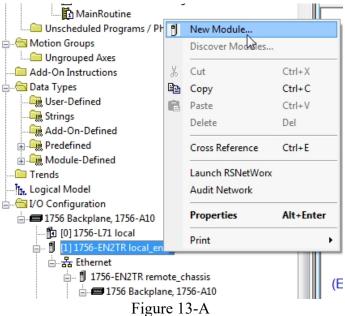
Figure 12-A – Ladder Logic Window

- Rung 0 PB1 on Local demo board will turn ON PL3 indicator on the Local demo board and PL7 on the Remote demo board.
- Rung 1 SS4 on Local demo board will turn ON PL3 indicator on the Remote demo board
- Rung 2 SS5 on Remote demo board will turn ON PL0 indicator on the Local demo board
- 14. Make any necessary changes to Ethernet Modules Properties windows General tabs Download the Project File Module\_2\_Remote\_Chassis.ACD to 1756-L71 processor



Verify correct operation.

Note: To add additional chassis to the I/O Configuration – Right click the local Ethernet module and choose New Module.



On the Select Module Type window – Select the type of communication module that will be located in the remote device.

			r Filters			Hide Filte	rs 🛠
	Module Type	e Category Filters	▲ 🔽		Module Type Ver	ndor Filters	*
גם 🔽 גם 🔲 גם 🛄	nalog communication communications Adapter controller ligital				poration		4
- C	Catalog Number	Description			Vendor	Category	*
175	56-EN2T	1756 10/100 Mbps Ethernet Bri	dge, Twisted	-Pair Media	Allen-Bradley	Communication	
175	56-EN2TR	1756 10/100 Mbps Ethernet Bri	-		Allen-Bradley	Communication	
175	56-EN2TSC	1756 10/100 Mbps Ethernet Bri	dge, Twisted	Pair Medi	Allen-Bradley	Communication	
175	56-EN3TR	1756 10/100 Mbps Ethemet Bri	dge, <mark>2-Port</mark> , 1	wisted-P	Allen-Bradley	Communication	
175	56-ENBT	1756 10/100 Mbps Ethemet Bri	dge, Twisted	-Pair Media	Allen-Bradley	Communication	-
170		1760 DL			Allere Des allere	C	•
95 of 426	6 Module Types Found					Add to Fa	vorites

Figure 14-A. Adding a module.



Note: To add additional modules a Remote Chassis – Right click the remote Ethernet module (located in Remote Chassis) and choose New Module.

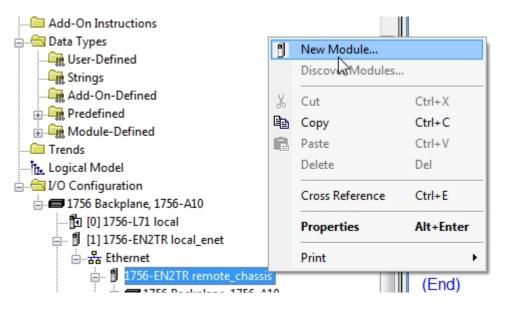


Figure 15-A. Choosing a new module.

On the Select Module Type window – Select the type of I/O module that will be located in the remote chassis.



Select Module Type	10.00.00						
Catalog Module Discovery Favori	tes						
Enter Search Text for Module Ty	Clea	ar Filters				Hide Filters	*
Module Typ	e Category Filters	<u> </u>		Module Type V	/endor Filters		-
Analog Communication Controller Jigital Drive			Hardy Proces Molex Incorp	icro Controls Inc ss Solutions			THE STREET
	Description			Vendor	Category		*
1756-IA32 1756-IA8D	32 Point 74V-132V AC Input 8 Point 79V-132V AC Diagnosti	c Input		Allen-Bradley Allen-Bradley	Digital Digital		
1756-IB16	16 Point 10V-31.2V DC Input			Allen-Bradley	Digital		
1756-IB16D 1756-IB16I	16 Point 10V-30V DC Diagnosti 16 Point 10V-30V DC Isolated I	nput, Sink/So		Allen-Bradley Allen-Bradley	Digital Digital		-
•		III					
41 of 133 Module Types Found						Add to Favor	ites
Close on Create					Create	Close	Help

Figure 16-A Adding I/O Module to Remote Chassis.



# **Review Questions**

- 1. T F Remote Chassis must be connected using Ethernet.
- 2. The communication module must be located in what slot of a chassis?
  - a) 6
  - b) Right most slot
  - c) 0
  - d) Doesn't matter
- 3. A communication module in a remote chassis is named Machine\_1, I/O tags in the chassis will be named:
  - a) Remote\_Chassis:
  - b) Local:
  - c) Machine\_1:
  - d) It depends on module address
- 4. A tag called LINE6:4:I.Data.3 is being used. Where is the module located.
  - a) A Local Chassis, Slot 6
  - b) A Remote chassis, Slot 6
  - c) A Remote chassis, Slot 4
  - d) A Remote chassis, Slot 3



- 5. A tag called LINE6:4:I.Data.3 is being used. What module terminal is being referenced?
  - a) 6
  - b) 4
  - c) 3
  - d) 1
- 6. T F A remote chassis does not require a processor.
- 7. A tag called LINE6:4:I.Data.3 is being used. What type of data is being referenced?
  - a) Analog Input
  - b) Analog Output
  - c) Discrete Input
  - d) Discrete Output
- 8. The processor I/O Fault has does not reference remote I/O modules:
  - a) True
  - b) False



## **Review Question Answers**

1) F

2) d

- 3) c
- 4) c
- 5) c
- 6) T
- 7) c
- 8) F

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