

PLC132 LAB 2.3: POINT I/O USING CONTROLLOGIX ETHERNET MODULES

Student Name: _____

Student ID: _____

LAB OUTCOMES:

1. Explain the basic set-up of Point I/O Ethernet adapter communication modules
2. Explain ControlLogix setup for projects using Point I/O chassis
3. Explain module tags on a Point I/O chassis

LAB PROCESS:

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

Part 1

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.

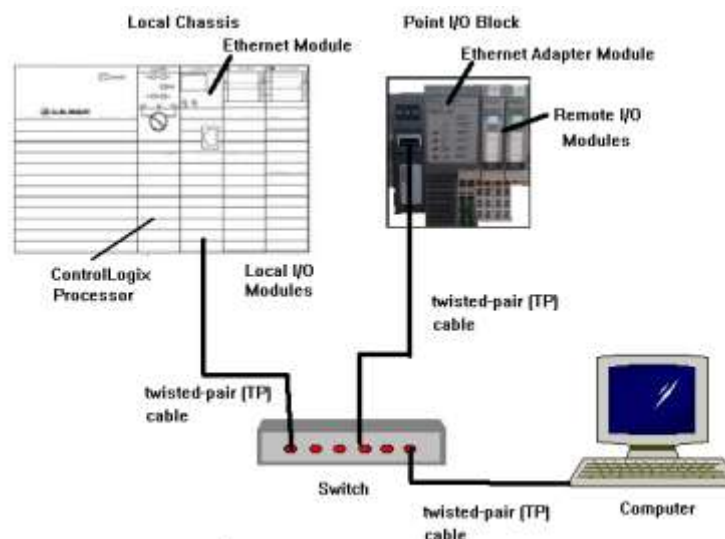


Figure 1-A
Point I/O Configuration

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

Point I/O Block – Communication Adapter Module, and Point I/O Modules
(Remote I/O)

Switch – Ethernet connection point for Computer, Local Ethernet Module and Point I/O Adapter Modules

Computer – Studio 5000 software, RSLinx software, Ethernet Port, Windows 7 OS

Cabling - twisted-pair

Note: Computer, Ethernet Communication Adapter and the Ethernet module must have the same Network ID

Computer, Ethernet Communication Adapter and the Ethernet module must have different Device (Host) IDs

Demo units - 1756-L71 processors version 24

1756-EN2TR Ethernet Communication Modules

Discrete I/O Modules

Point I/O Ethernet Adapter Module -1734-AENT

Point I/O Input Module -1734-IB4

Point I/O Output Module -1734-OB4

Point I/O Block Set-up

1. Determine the IP Address and Subnet Mask information for the computer

IP Address:

Subnet Mask:

MAC Address:

2. With RSLinx - verify that there is a connection to the 1756-EN2TR

IP Address:

Subnet (Network) Mask:

MAC Address:

3. Using the BOOTP / DHCP Server assign an IP Address and Subnet (Network) Mask to the 1734-AENT Ethernet Adapter Module.

IP Address:

Subnet (Network) Mask:

MAC Address:

What Type (Protocol) does the 1734- AENT module use:

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

Once the Communication Modules are configured and connected the RSWho window in RSLinx will appear similar to Figure 2-A.

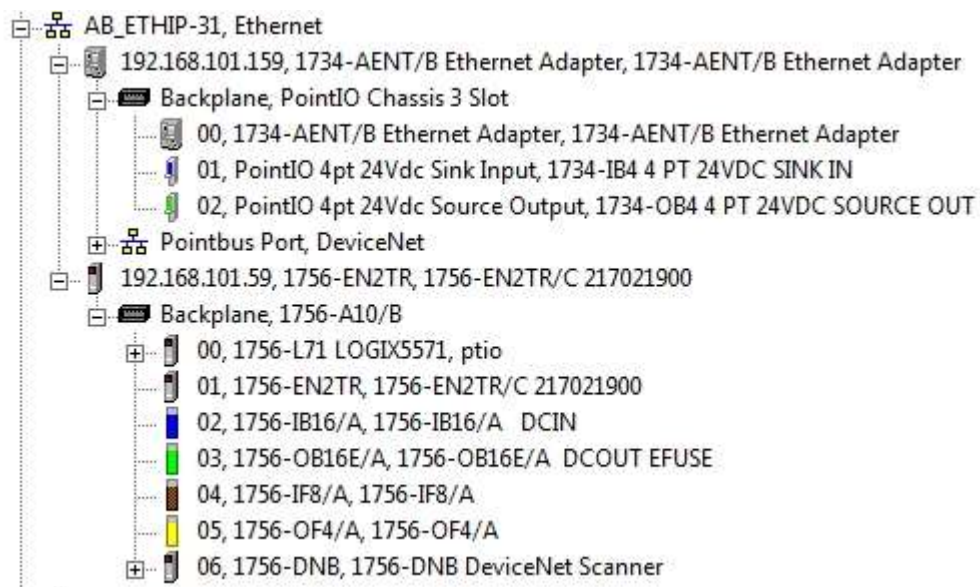


Figure 2-A - RSLinx RSWho Screen
Ethernet Connections

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 Point I/O Block Ethernet Adapter Modules has an IP address of 192.168.101.159.

Point I/O Backplane is _____ slots

Part Number Ethernet Adapter:

Slot Location Ethernet Adapter:

Revision Ethernet Adapter:

Part Number Input Module:

Slot Location Input Module:

Revision Input Module:

Part Number Output Module:

Slot Location Output Module:

Revision Output Module:

3. Using the Project File Module_2_Point_IO.L5K, Import in to Studio 5000.

4. Navigate to and expand the I/O Configuration folder.

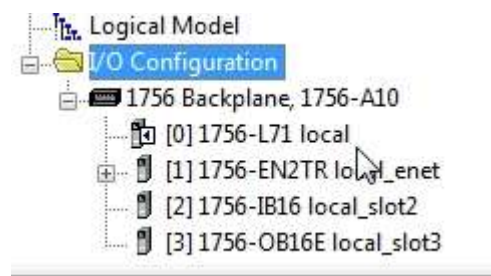


Figure 3-A
I/ O Configuration Folder

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

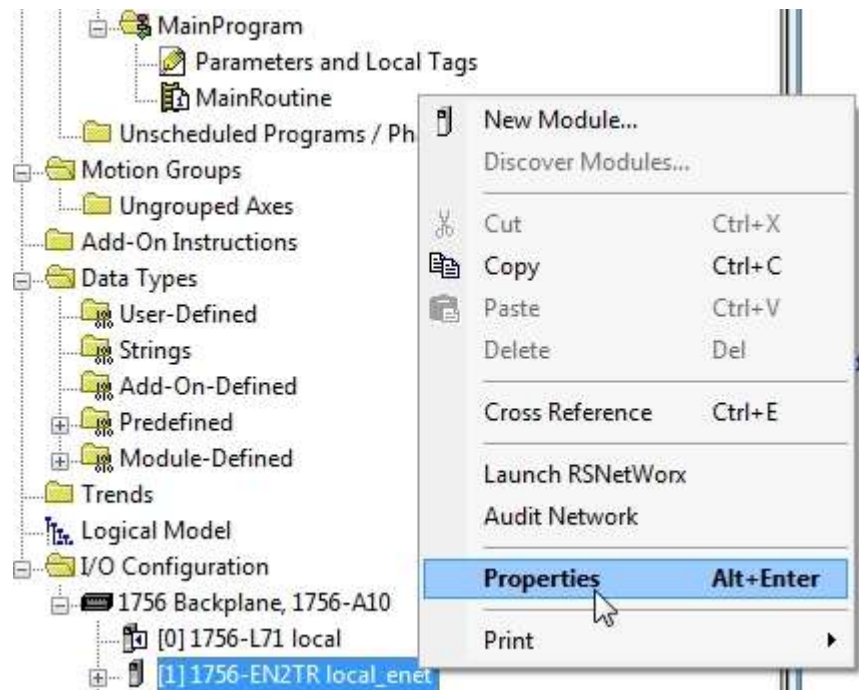


Figure 4-A

Navigate to 1756-EN2TR Properties

6. View General tab Information

See Figure 5-A

General | Connection | RSNetWorx | Module Info | Internet Protocol | Port Configuration | Network | Time Sync

Type: 1756-EN2TR 1756 10/100 Mbps Ethernet Bridge, 2-Port, Twisted-Pair Media Change Type...

Vendor: Allen-Bradley

Parent: Local

Name: local_enet

Description:

Module Definition Change ...

Revision: 10.7

Electronic Keying: Compatible Module

Connection: None

Time Sync Connection: None

Ethernet Address

☐ Private Network: 192.168.1.

☒ IP Address: 192 . 168 . 101 . 122

☐ Host Name:

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

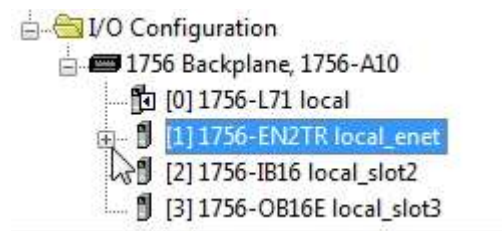


Figure 6-A

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

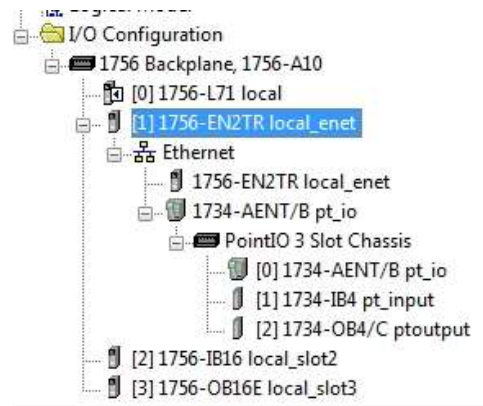


Figure 7-A

The information listed under [1] 1756-EN2TR local_enet is the configuration information for the Point I/O Block.

PointIO 3 Slot Chassis

In slot 0 of the PointIO chassis is the communication adapter module –
[0] 1734-AENT/B pt_io

In slot 1 of the PointIO chassis is a 4-point input module –
[1] 1734-IB4 pt_input

In slot 2 of the PointIO chassis is a 4-point output module –
[2] 1734-OB4/C

This information must match the modules' location in the actual PointIO chassis.

9. Right click [0] 1734-AENT/B pt_io to open its Properties window

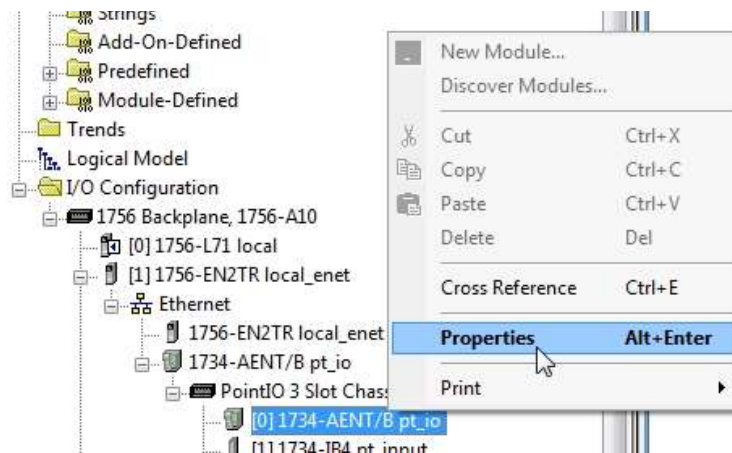


Figure 8-A

10. Navigate to General tab for the [0] 1734-AENT pt_io module.

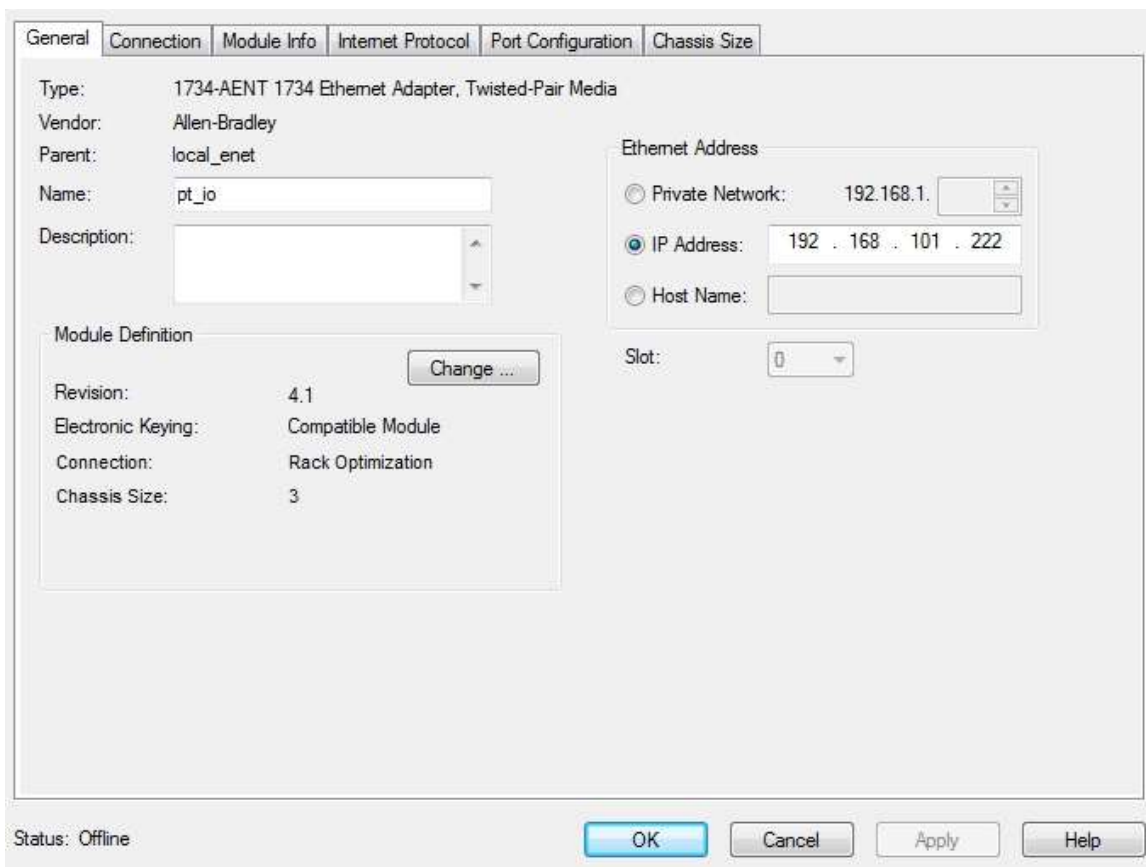


Figure 9-A Ethernet Adapter Module's Properties Window – General Tab

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 – pt_io shown in example

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

Chassis Size: Number of Slots in PointIO Chassis – must match to actual chassis size

To change Revision, Electronic Keying, Connection or Chassis Size – Click the Change button to open the Module Definition window

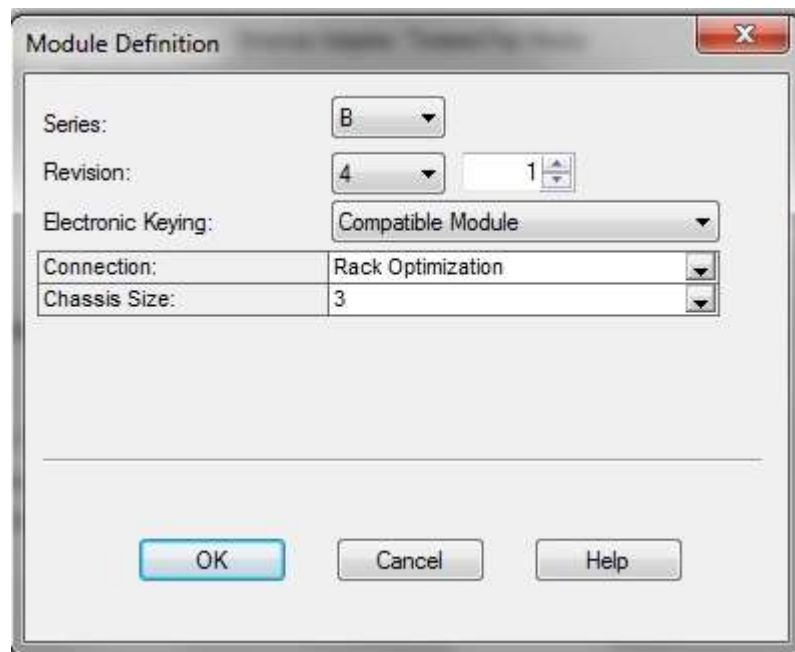


Figure 10-A – Module Definition Window

Click OK to return to 1734-AENT Properties window – General tab.
Click OK on General tab to return to Controller Organizer window.

11. Navigate to Controller Tags
Open Controller Tags window.



Figure 10-A – Controller Tags

12. View Controller Tag window.

Name	Value	Force Mask	Style	Data Type
int1	0		Decimal	BOOL
+ Local:2:C	{...}	{...}		AB:1756_DI:C:0
+ Local:2:I	{...}	{...}		AB:1756_DI:I:0
+ Local:3:C	{...}	{...}		AB:1756_DO:C:0
+ Local:3:I	{...}	{...}		AB:1756_DO_Fus...
+ Local:3:O	{...}	{...}		AB:1756_DO:O:0
+ local_array	{...}	{...}	Decimal	DINT[10]
+ local_tag1	0		Decimal	DINT
+ local_timer1	{...}	{...}		TIMER
+ mess_read	{...}	{...}		MESSAGE
+ Mess1	{...}	{...}		MESSAGE
+ Mess2	{...}	{...}		MESSAGE
+ pt_io:1:C	{...}	{...}		AB:1734_DI4:C:0
+ pt_io:1:I	2#0000_0000		Binary	SINT
+ pt_io:2:C	{...}	{...}		AB:1734_DO4_N...
+ pt_io:2:O	2#0000_0000		Binary	SINT
+ pt_io:I	{...}	{...}		AB:1734_3SLOT:I:0
+ pt_io:O	{...}	{...}		AB:1734_3SLOT:...
+ read_local	0		Decimal	DINT

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.

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

What is the Name of the 1756-AENT Ethernet module located in the PointIO Chassis?

Note: I/O tags for PointIO chassis I/O modules begin with the Name of the communication adapter module for the PointIO Chassis.

For example – pt_io:1:I tags – refers to the input module in slot 1 of the PointIO chassis.

pt_io:2:O tags – refers to the output module in slot 2 of the PointIO chassis.

13. Navigate to the Ladder Logic screen – MainRoutine.

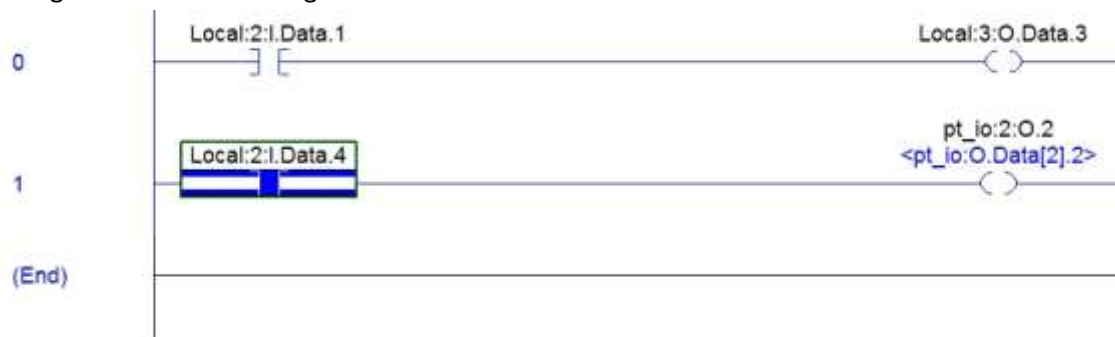


Figure 12-A – Ladder Logic Window

Rung 0 – PB1 on Local demo board will turn ON PL3 indicator on the Local demo board

Rung 1 – SS4 on Local demo board will turn ON indicator LED 2 on the 1734-OB4 output module.

Note: No actual input / output devices are wired to Point IO Block modules on demo boards

14. Make any necessary changes to Ethernet Properties windows

Download the Project File Module_2_Point_IO.ACD to 1756-L71 processor

Verify correct operation.

REVIEW QUESTIONS

1. T F Point I/O Chassis must be connected using Ethernet.

2. The communication module must be located in what slot of a Point I/O chassis?
 - a) 6
 Right most slot
 - b)
 - 0
 - c)
 - Doesn't matter
 - d)

3. A communication adapter module in a PointIO chassis is named – Conveyor_1, I/O tags in the chassis will be named:
 - a) Remote_Chassis:
 Local:
 - b)
 - Conveyor_1
 - c)
 - It depends on module address
 - d)

4. A 1734-OB4 Point I/O module can control ____ devices
 - a) 8
 - 4
 - b)
 - 16
 - c)
 - 32
 - d)

5. A tag called Tank:1:I.Data.3 is being used. What module terminal is being referenced?
- a) 6
 - 4
 - b)
 - 3
 - c)
 - 1
 - d)
6. T F Point I/O Modules do not have revision numbers.
7. A tag called Point_IO:1:I.Data.3 is being used. What is the slot location of the module in the PointIO chassis?
- a) 3
 - 0
 - b)
 - 1
 - c)
 - Cannot determine
 - d)
8. The processor I/O Fault has does not reference Point I/O modules:
- a) True
 - b) False

The outcomes of this exercise (listed on page 1) specifies the skills that the Student must demonstrate to the Instructor. Once the Instructor is satisfied with the demonstration of Knowledge & Skills by the individual student, they will sign this document (for the student), then enter a 100% into the Hands-On Lab grade in Sakai.

I verify that this student has completed all of the requirements of this Hands-On Assessment:

Student Name: _____

Faculty Signature: _____ Date: _____

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