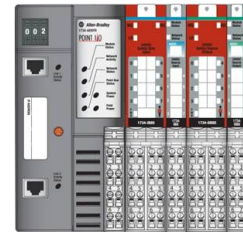


# Configuring GuardLogix to Control POINT Guard I/O Modules

Safety Rating: SIL3/PL(e), according to IEC 61508 and ISO 13849-1



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## Introduction

This application example describes how to configure a GuardLogix controller to own POINT Guard I/O modules that reside in the same chassis as standard POINT I/O modules. In this example, the standard POINT I/O modules are owned by a ControlLogix controller.

### Features and Benefits

- Reduced panel space compared to CompactBlock I/O
- Blend Safety and standard I/O in a single POINT I/O chassis

## Important User Information

Solid state equipment has operation characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at <http://literature.rockwellautomation.com>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable. In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.


No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

<p><b>WARNING</b></p> 	<p>Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.</p>
<p><b>IMPORTANT</b></p>	<p>Identifies information that is critical for successful application and understanding of the product.</p>
<p><b>ATTENTION</b></p> 	<p>Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.</p>
<p><b>SHOCK HAZARD</b></p> 	<p>Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.</p>
<p><b>BURN HAZARD</b></p> 	<p>Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.</p>

## General Safety Information

<b>IMPORTANT</b>	This application example is for advanced users and assumes that you are trained and experienced in safety system requirements.
<b>ATTENTION</b> 	A risk assessment should be performed to make sure all task and hazard combinations have been identified and addressed. The risk assessment may require additional circuitry to reduce the risk to a tolerable level. Safety circuits must take into consideration safety distance calculations which are not part of the scope of this document.

Contact Rockwell Automation to find out more about our safety risk assessment services.

## Description

This application example shows how to configure safety POINT Guard I/O modules to communicate safety data to a GuardLogix controller. A standard ControlLogix controller also resides in the same chassis and is configured to exchange standard data with POINT I/O modules.

### Safety Function

POINT Guard input and output modules can be connected on EtherNet/IP and DeviceNet (via the 1734-PDN adapter) networks, allowing safety data to be exchanged between the safety I/O modules and the GuardLogix controller system using the CIP Safety protocol.

The CIP Safety protocol is an end-node to end-node safety protocol which allows routing of CIP Safety messages to and from CIP Safety devices through bridges, switches, and routers.

The protocol also lets standard and safety devices co-exist on the same wire, along with mixed connections on the same device.

### Bill of Material

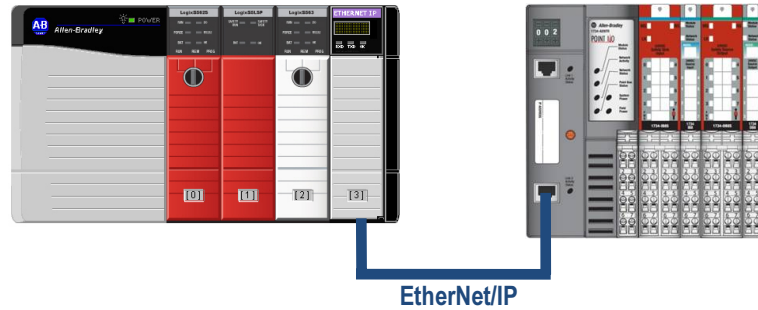
This application example uses these components.

Catalog Number	Description	F/W Rev.
1756-L62S	GuardLogix safety controller	17
1756-LSP	GuardLogix safety partner	17
1756-L63	ControlLogix controller	17
1756-ENBT/A	Ethernet module	4
1756-A4	ControlLogix 4-slot chassis	N/A
1756-PA72	ControlLogix power supply	N/A
1734-AENT	POINT I/O Ethernet adapter	3
1734-IB8S	8-point safety input module	1
1734-OB8S	8-point safety output module	1
1734-IB4	4-point input module	3
1734-OB8	8-point relay output module	3

## Setup and Wiring

Setup your hardware configuration as shown.

### System Overview



### System Setup

Setup your hardware configuration as described below:

#### Logix5000 Chassis

Place the corresponding hardware in the appropriate slots.

Slot Number	Catalog Number
0	1756-L62S
1	1756-LSP
2	1756-L63
3	1756-ENBT/A

#### 1734 Point IO Chassis

Place the corresponding hardware in the appropriate slots.

Slot Number	Catalog Number
0	1734-AENT
1	1734-IB8S
2	1734-OB8S
3	1734-IB4
4	1734-OB8

## Configure the GuardLogix Controller

To configure the GuardLogix controller, first you need to create a new project in RSLogix 5000 software and add the 1756-ENBT EtherNet/IP bridge to your controller organizer. Then, you add the 1734-AENT POINT I/O Ethernet adapter to your Ethernet network and configure communication for the POINT Guard I/O modules.

## Create a GuardLogix Controller Project

Follow these steps to configure the GuardLogix controller and add the 1756-ENBT EtherNet/IP bridge module.

1. Open RSLogix 5000 software.
2. From the File menu, choose New to create a new project.
3. Fill out the New Controller dialog box as shown and click OK.

**New Controller**

Vendor: Allen-Bradley

Type: 1756-L62S ControlLogix5562S Safety Controller

Revision: 17

Redundancy Enabled

Name: GLX\_PointGuard

Description:

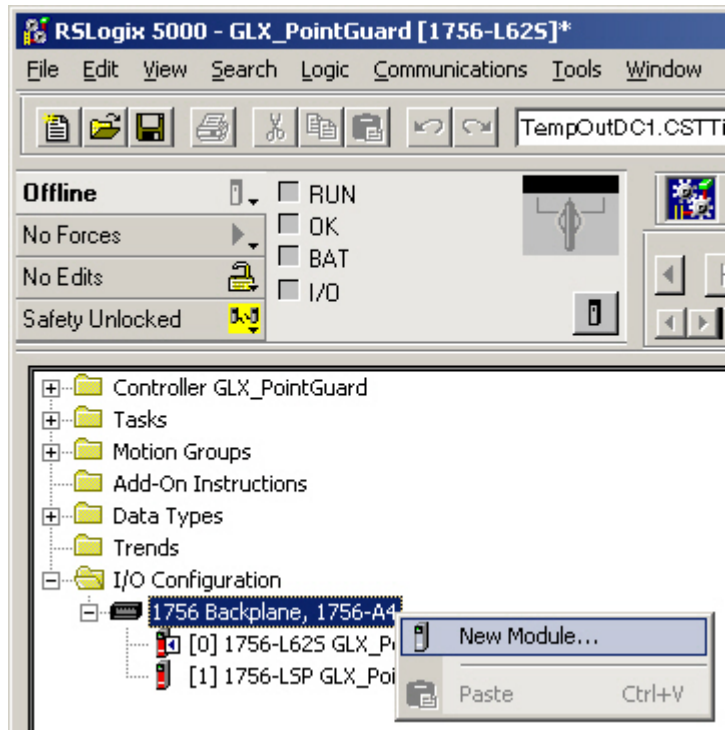
Chassis Type: 1756-A4 4-Slot ControlLogix Chassis

Slot: 0 Safety Partner Slot: 1

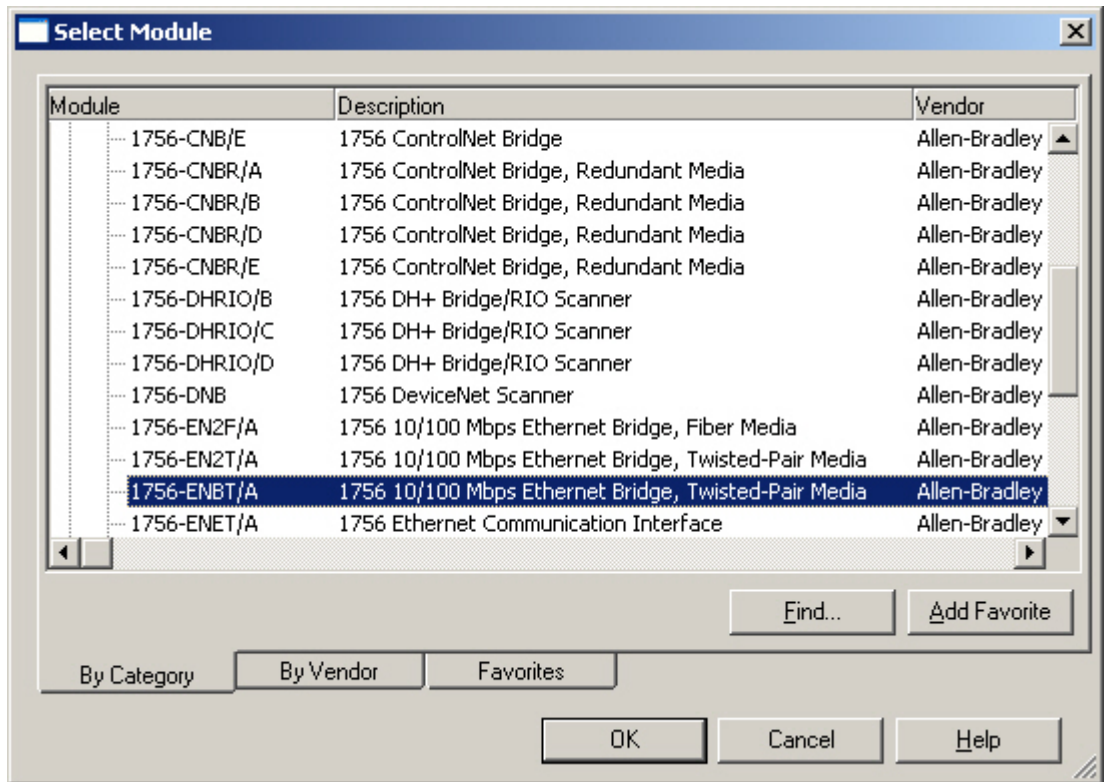
Create In: C:\RSLogix 5000\Projects

Buttons: OK, Cancel, Help, Browse...

- In the Controller Organizer, right-click 1756-Backplane and choose New Module.

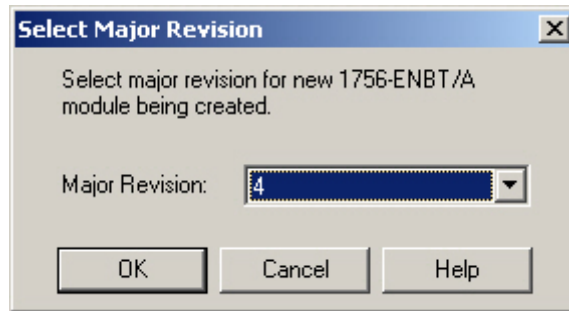


- In the Select Module dialog box, click the + sign to expand Communications and select the 1756-ENBT/A module.

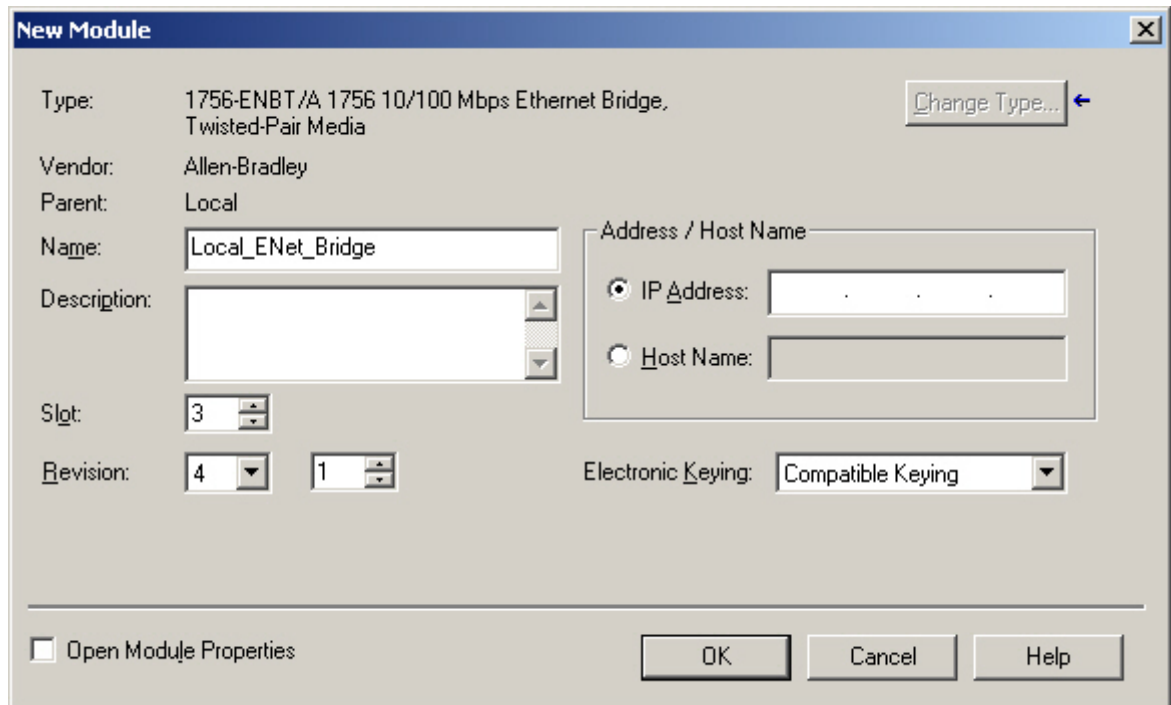


- Click OK.

7. In the Select Major Revision dialog box, choose 4 and click OK.



8. In the New Module dialog box, type the module name and choose slot 3.



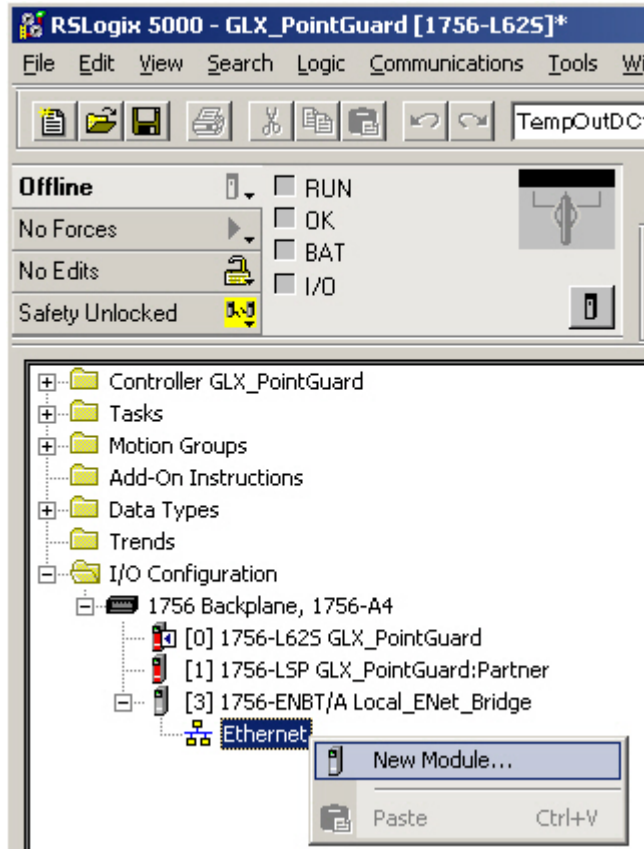
9. Click OK.

The 1756-ENBT module appears in the Controller Organizer with Ethernet displayed below it.

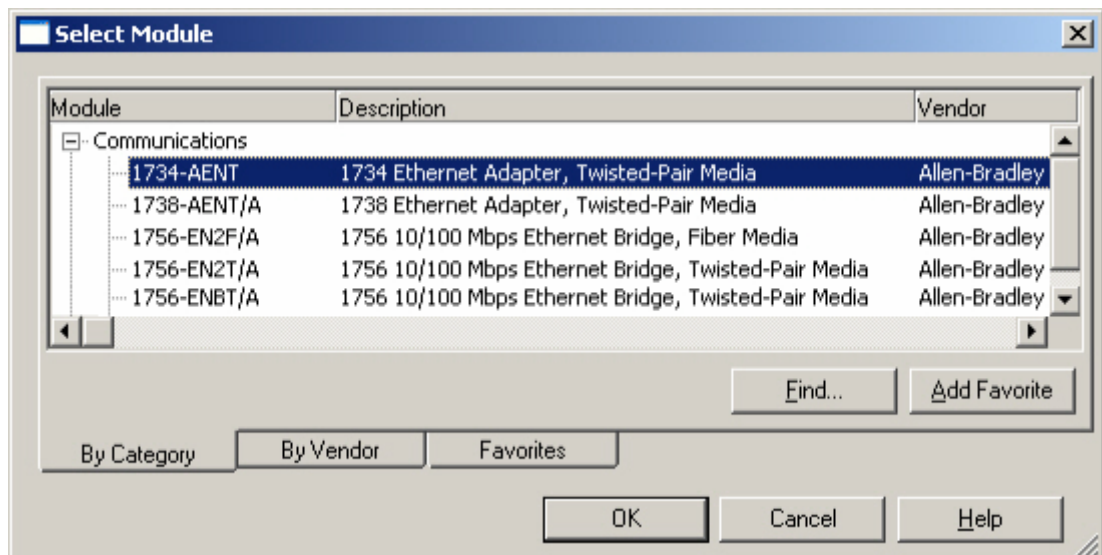
## Configure the 1734-AENT Adapter

Follow these steps to add the 1734-AENT Ethernet Adapter to your controller project.

1. Right-click Ethernet and choose New Module.



2. In the Select Module dialog box, click the + sign to expand Communications and then select the 1734-AENT adapter.





3. In the New Module dialog box, type the module name and IP address.

**New Module**

General\* | Connection | Module Info | Port Configuration | Port Diagnostics | Chassis Size

Type: 1734-AENT 1734 Ethernet Adapter, Twisted-Pair Media  
 Vendor: Allen-Bradley  
 Parent: Local\_ENet  
 Name: PointIO\_ENet\_Adapter  
 Description:   
 Ethernet Address:  
 IP Address: 192 . 168 . 1 . 12  
 Host Name:   
 Slot: 0

Module Definition  
 Series: A   
 Revision: 2.1  
 Electronic Keying: Compatible Module  
 Connection: Rack Optimization  
 Chassis Size: 1

Status: Creating

4. Click Change.
5. In the Module Definition dialog box, change the Major Revision to 3 and the Chassis Size to 5.

**Module Definition\***

Series: A  
 Revision: 3 . 1  
 Electronic Keying: Compatible Module  
 Connection: Rack Optimization  
 Chassis Size: 5

The 1734-AENT must be set to major firmware version 3 or later to communicate with POINT Guard I/O modules. The chassis size of 5 reflects the 4 POINT Guard I/O modules in addition to the 1734-AENT adapter.

6. Click OK.

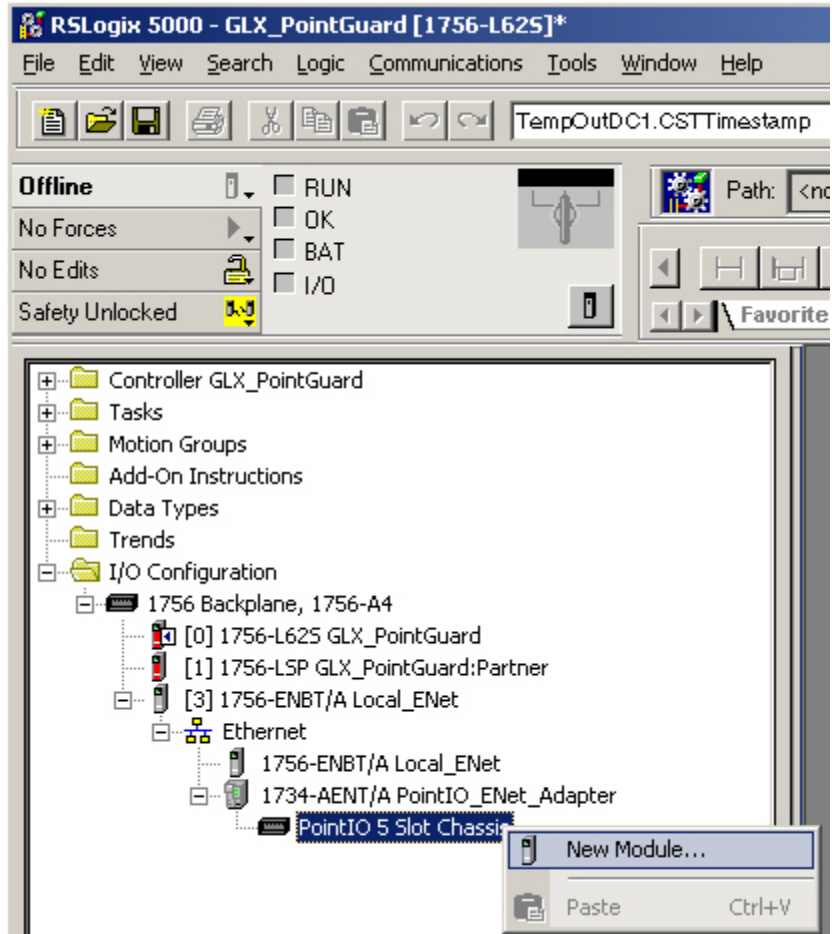
7. At the prompt, click Yes.
8. On the New Module Properties dialog box, click OK.

The 1734-AENT adapter appears in the Controller Organizer with the Point IO 5 Slot Chassis backplane displayed below it.

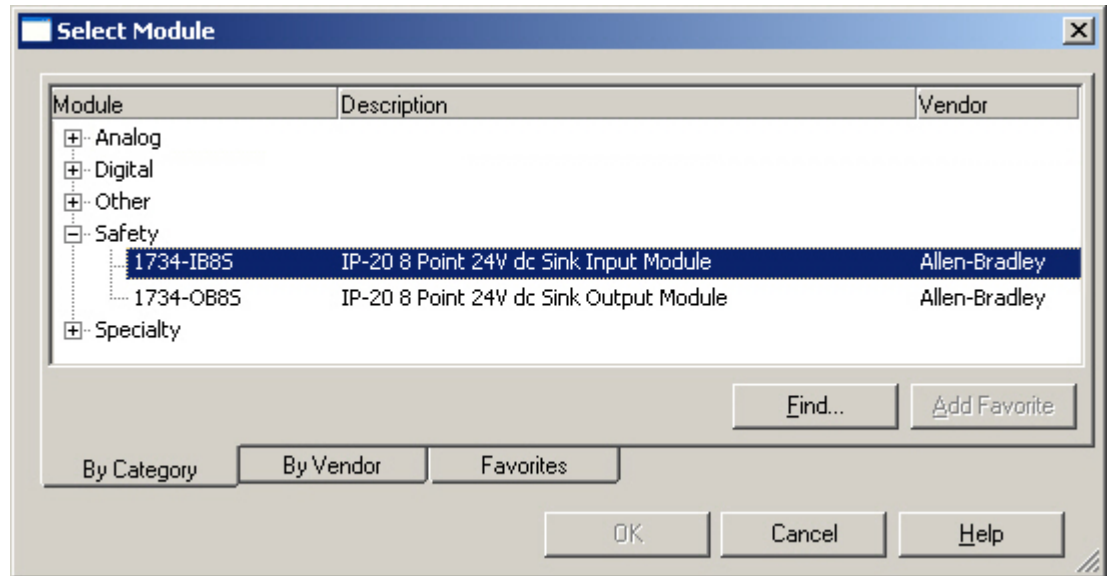
## Configure the POINT Guard I/O Modules

Follow these steps to add the 1734-IB8S and 1734-OB8S modules to the POINT I/O backplane.

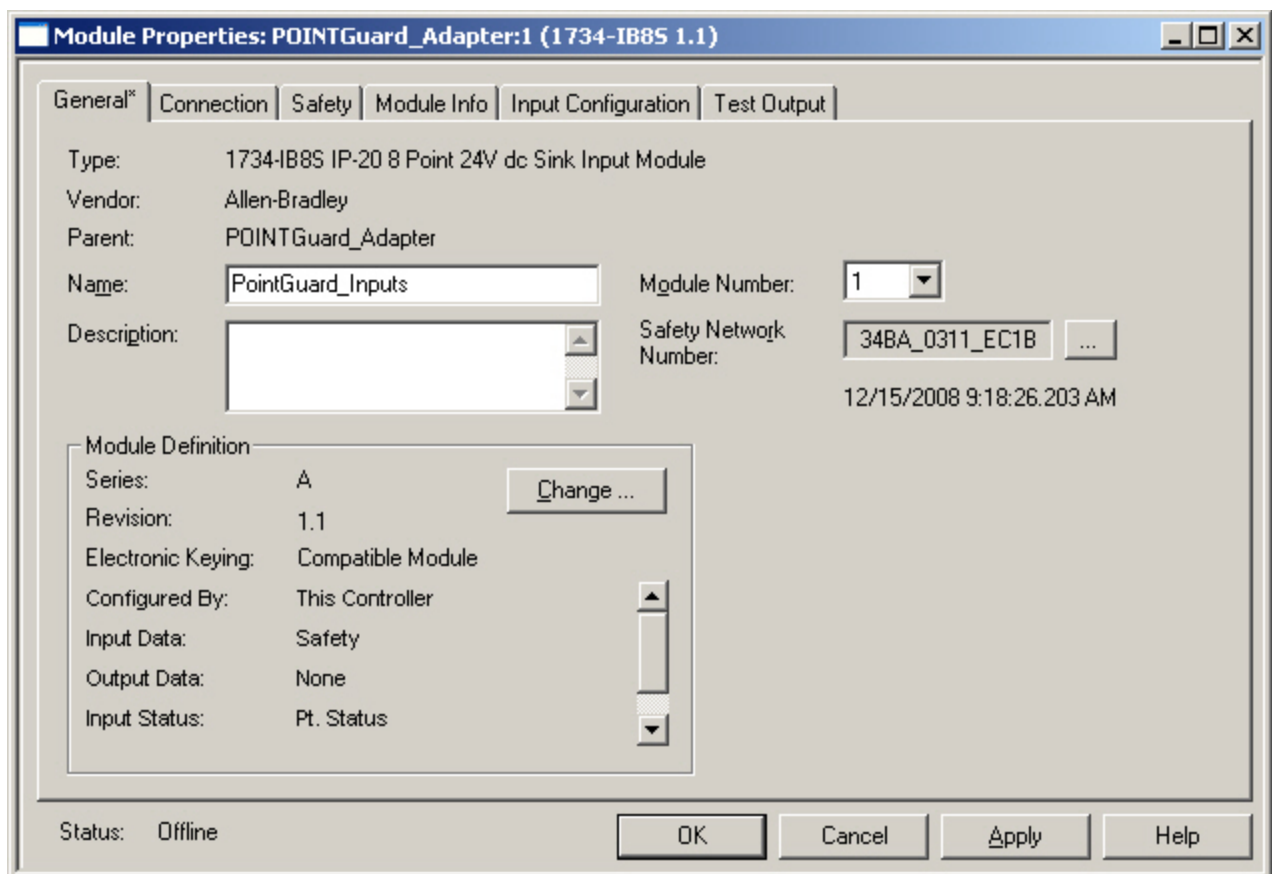
1. Right-click PointIO 5 Slot Chassis and choose New Module.



- In the Select Module dialog box, click the + sign to expand Safety and select the 1734-IB8S module.

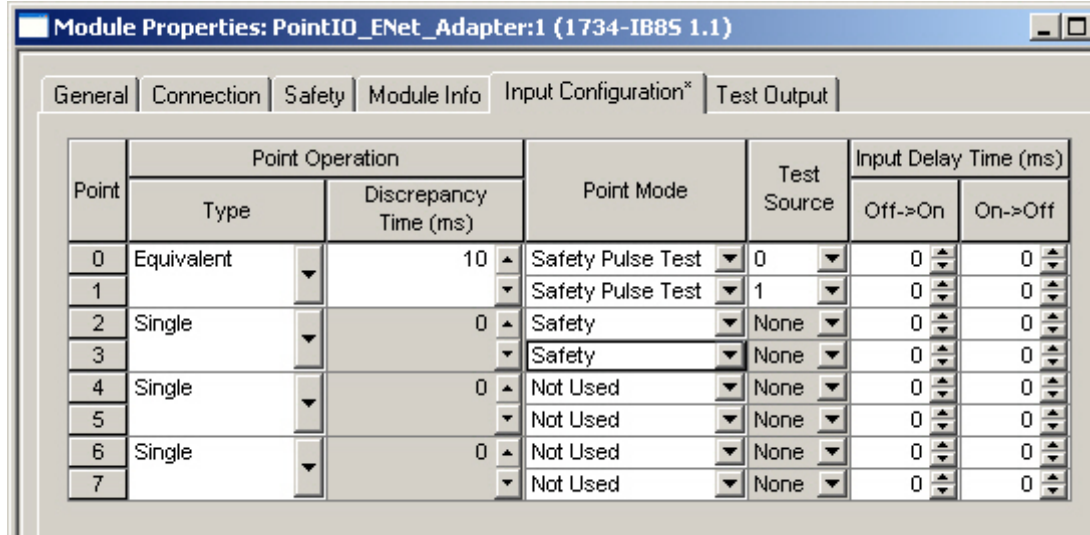


- Click OK.
- In the Module Definition dialog box, type a name for the 1734-IB8S module.

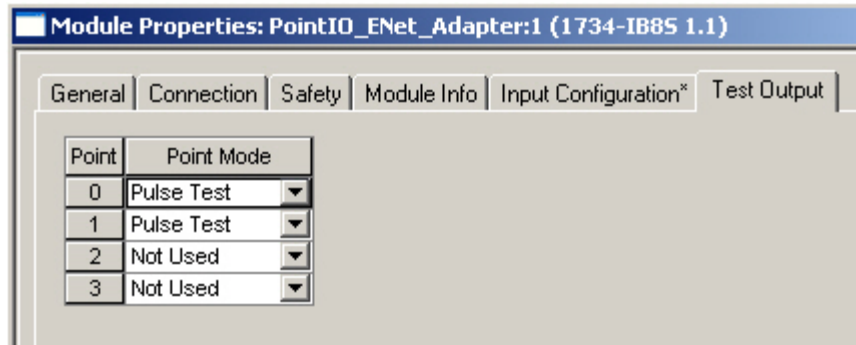


In the module definition section, you can modify the type of status information that is contained within the module defined data structure.

- Choose the Input Configuration tab and configure the inputs you are using in your application.



- Choose the Test Output tab and configure the test outputs you are using in your application.



## 7. Choose the Safety tab.

Module Properties: POINTGuard\_Adapter:1 (1734-IB8S 1.1)

General | Connection | **Safety** | Module Info | Input Configuration | Test Output

Connection Type	Requested Packet Interval (RPI) (ms)	Connection Reaction Time Limit (ms)	Max Observed Network Delay (ms)
Safety Input	10	40.1	Reset

Advanced...

Configuration Ownership:  
Reset Ownership

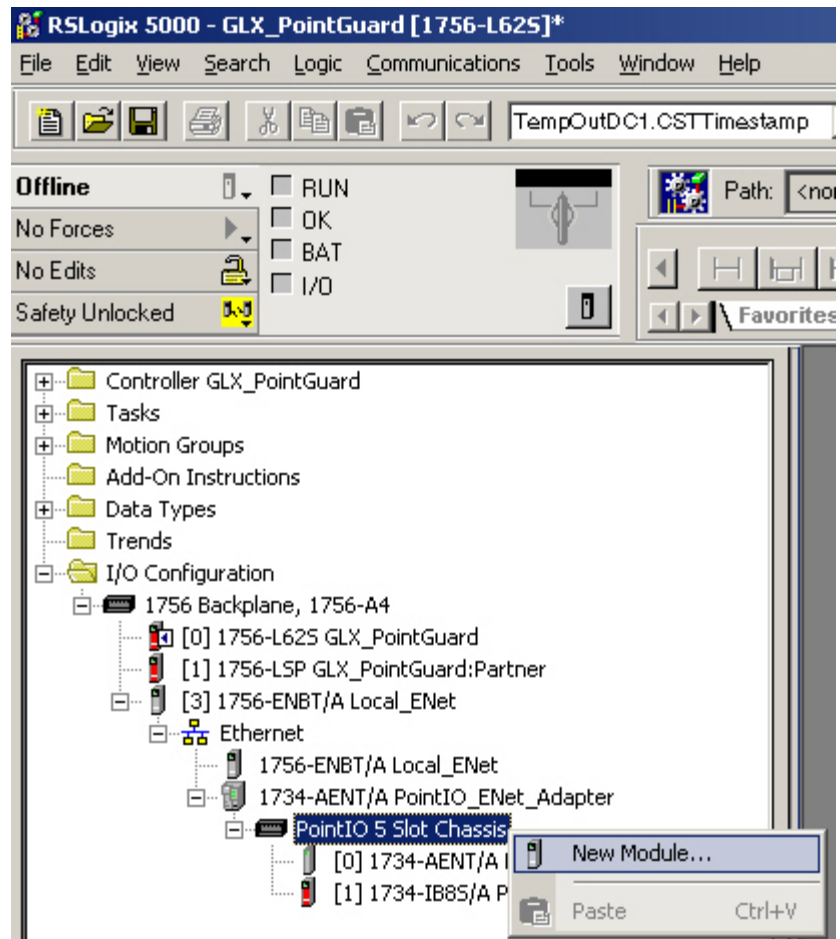
Configuration Signature:  
 ID: 7376\_1957 (Hex) Copy  
 Date: 12/15/2008  
 Time: 3:29:38 PM 406 ms

Status: Offline      OK      Cancel      Apply      Help

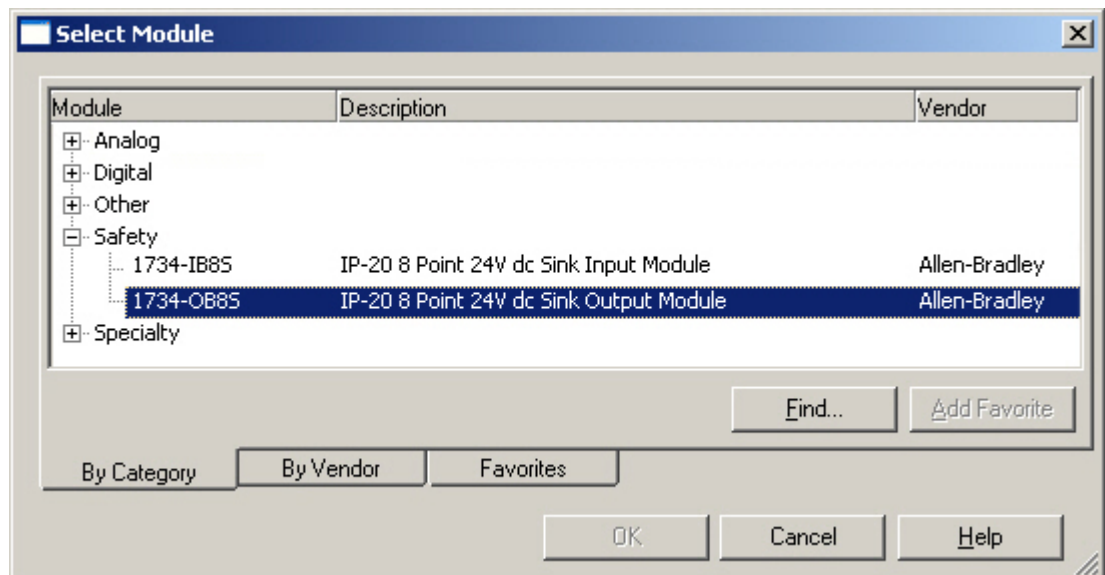
8. Configure your RPI and Connection Reaction Time Limit in accordance with the requirements of your application.
9. Click OK.

The 1734-IB8S module appears in the Controller Organizer.

10. Right-click PointIO 5 Slot Chassis and choose New Module.



11. In the Select Module dialog, click the + sign to expand Safety and select the 1734-OB8S module.



12. Click OK

13. In the Module Definition dialog, type a name for the 1734-OB8S module.

**Module Properties: POINTGuard\_Adapter:2 (1734-OB8S 1.1)**

General\* | Connection | Safety | Module Info | Output Configuration

Type: 1734-OB8S IP-20 8 Point 24V dc Sink Output Module  
 Vendor: Allen-Bradley  
 Parent: POINTGuard\_Adapter  
 Name: PointGuard\_Outputs  
 Description:   
 Module Number: 2  
 Safety Network Number: 34BA\_0311\_EC1B  
 12/15/2008 9:18:26.203 AM

**Module Definition**  
 Series: A  
 Revision: 1.1  
 Electronic Keying: Compatible Module  
 Configured By: This Controller  
 Input Data: None  
 Output Data: Safety  
 Input Status: Combined Status-Readback-Power

Status: Offline

OK Cancel Apply Help

In the module definition section, you can modify the type of status information that is contained within the module defined data structure.

14. Choose the Output Configuration tab and configure the outputs you are using in your application.

**New Module**

General\* | Connection | Safety | Module Info | Output Configuration\*

Point	Point Operation	Point Mode
	Type	
0	Dual	Safety Pulse Test
1		Safety Pulse Test
2	Dual	Safety
3		Safety
4	Single	Safety
5		Not Used
6	Dual	Not Used
7		Not Used

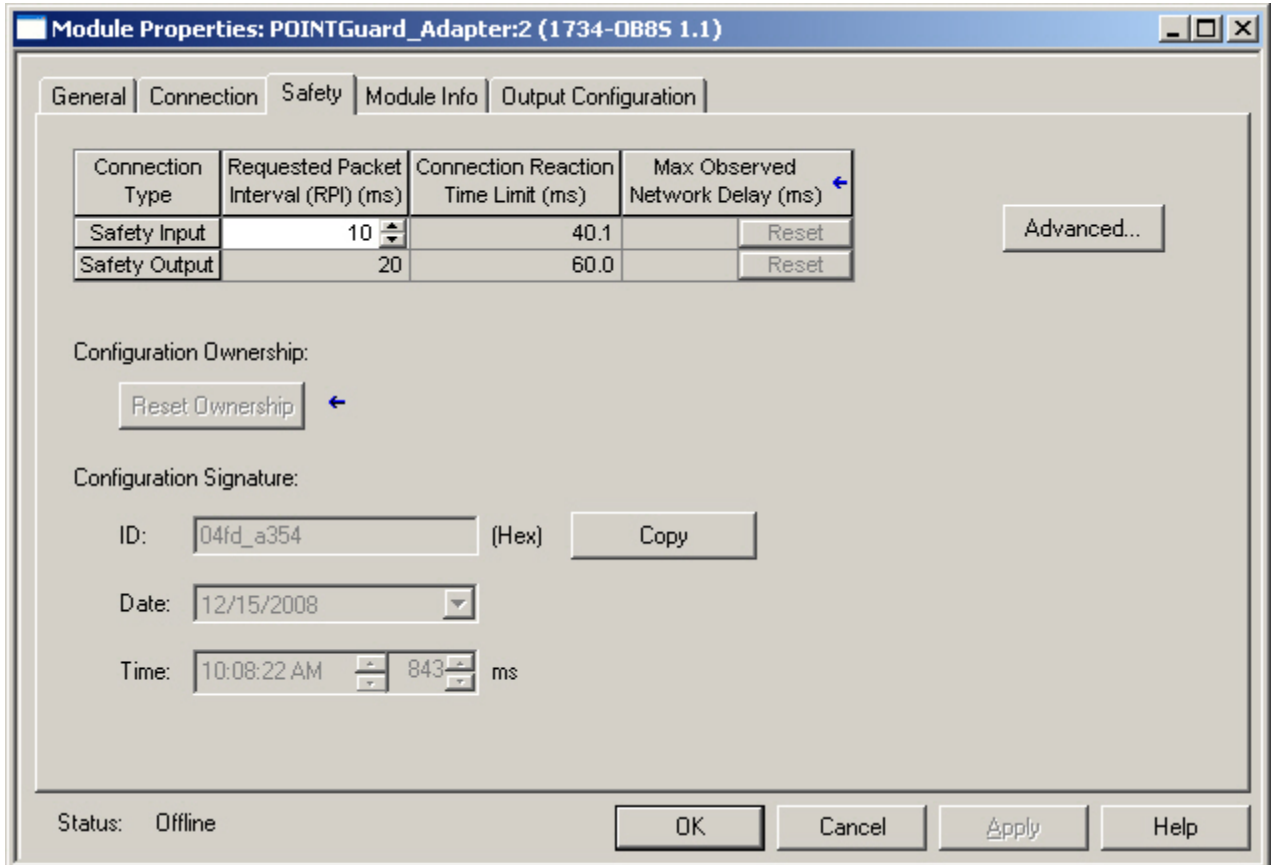
Output Error Latch Time: 1000 ms

Status: Creating

OK Cancel Help

15. Choose the Safety tab.

16. Configure your RPI and Connection Reaction Time Limit in accordance with the requirements of your application.



17. Click OK.

The 1734-OB8S module appears in the Controller Organizer.

You have completed configuring your project to communicate with the POINT Guard I/O modules.



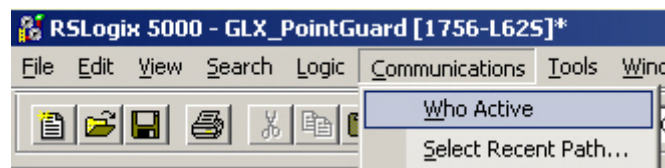
## Establish Communication and Download the GuardLogix Project

The data you use in your application code can be found within the controller tags. PointIO\_ENet\_Adapter:1:X corresponds to data for the 1734-IB8S and PointIO\_ENet\_Adapter:2:X corresponds to data for the 1734-OB8S module.

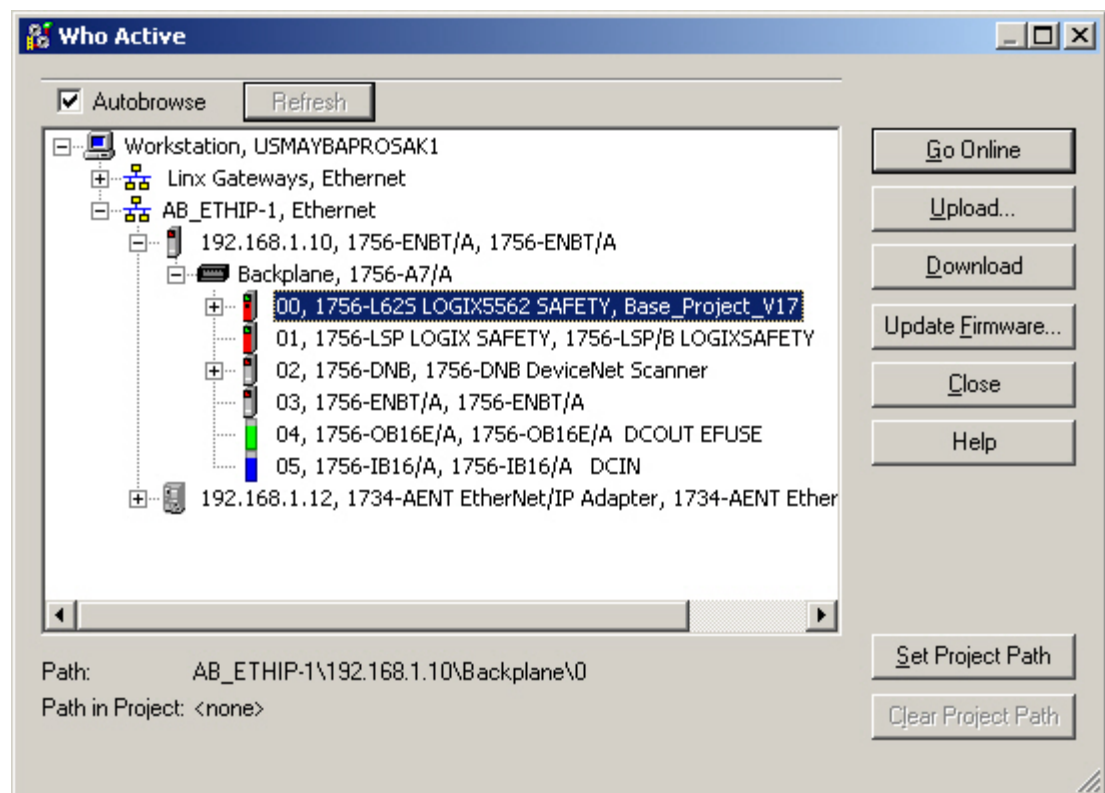
Name	Alias For	Data Type	Class
PointIO_ENet_Adapter:1:1		AB:1734_IB8S_Safety3:1:0	Safety
PointIO_ENet_Adapter:1:0		AB:1734_IB8S:0:0	Safety
PointIO_ENet_Adapter:2:1		AB:1734_OB8S_Safety3:1:0	Safety
PointIO_ENet_Adapter:2:0		AB:1734_OB8S:0:0	Safety

Follow these steps to download your project.

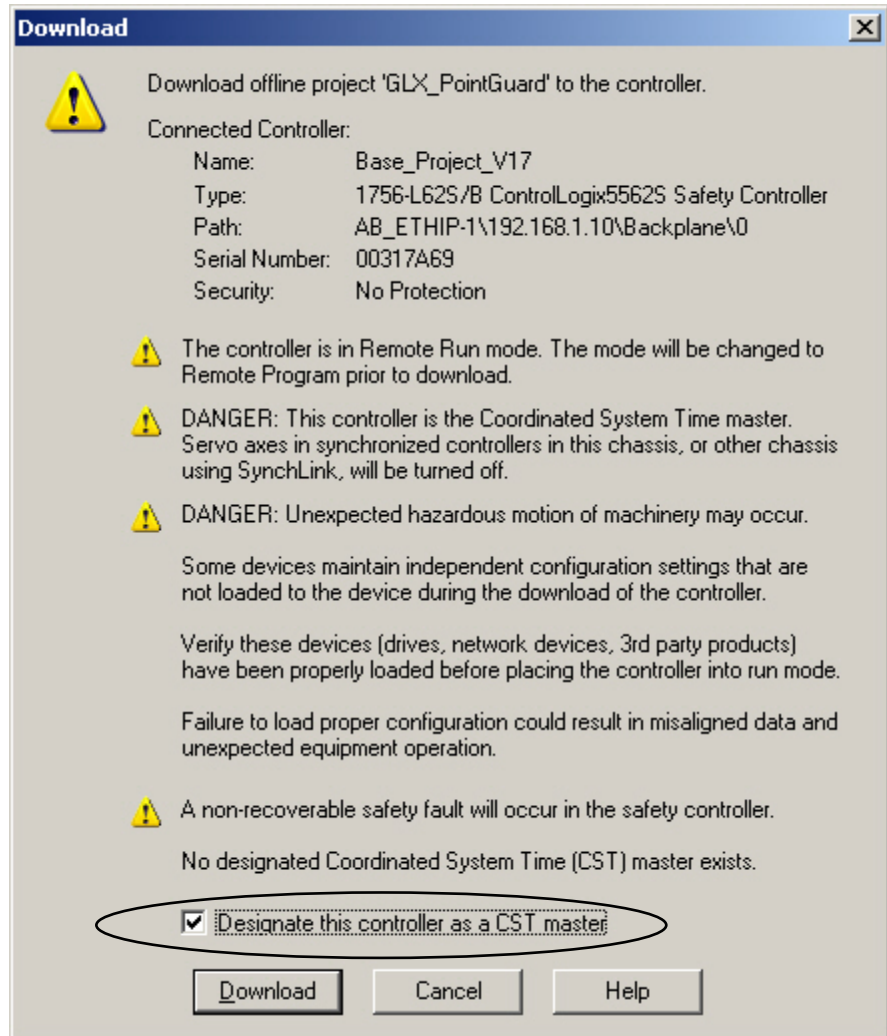
1. From the Communications menu, choose Who Active.



2. From the Who Active dialog box, navigate to the 1756-L62S controller and click Download.



3. In the Download dialog box, check Designate this controller as CST Master, and then click Download.



4. Place the Controller in Remote Run mode.

## Fixing Communication Errors

At this point you may have communication errors with the 1734-AENT, 1734-IB8S, and/or the 1734-OB8S as indicated by the yellow triangle symbols.

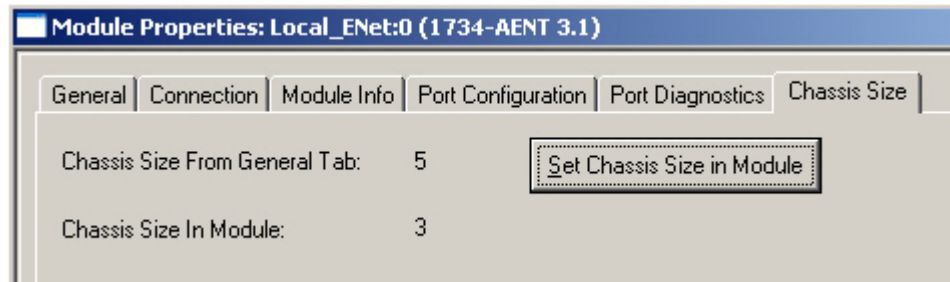
### Module State Error

The most common error associated with the 1734-AENT at this point is “Module or state of module does not allow object to perform requested service.” The cause of this error is very likely that the chassis size in the project does not reflect the chassis size configured in the adapter.

Follow these steps to fix this error.

1. Open the Module Properties dialog box of the 1734-AENT.
2. Choose the Chassis Size tab.

3. Click Set Chassis Size in Module.

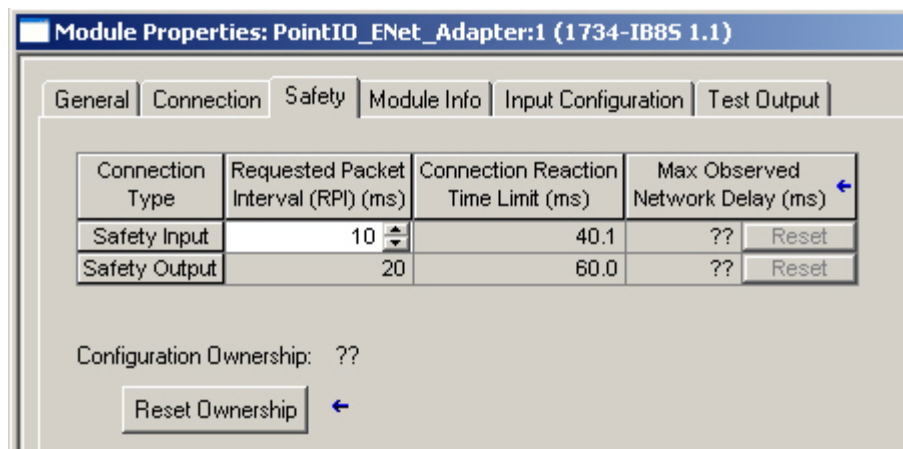


### Safety Network Mismatch or Configuration Ownership Errors

If you are seeing a yellow triangle on the 1734-IB8S or 1734-OB8S module, you are likely seeing a Safety Network Mismatch error or Configuration Ownership error.

Follow these steps to correct these errors.

1. Open the Module Properties dialog box for the affected module.
2. Choose the Safety tab.
3. Click Reset Ownership.



## Configure the ControlLogix Controller

To configure the ControlLogix controller, first you need to create a new project in RSLogix 5000 software and add the 1756-ENBT EtherNet/IP bridge to your controller organizer. Then, you add the 1734-AENT POINT I/O Ethernet adapter to your Ethernet network and configure communication for the POINT I/O modules.

### Create a ControlLogix Controller Project

Follow these steps to create a ControlLogix project for standard control.

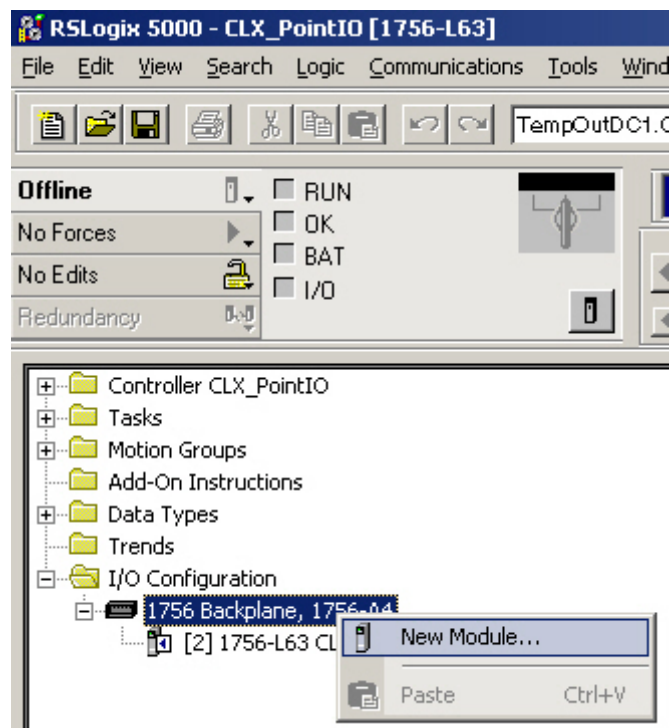
1. Open RSLogix 5000 software.
2. From the File menu, choose New.

3. Fill out the New Controller dialog box as shown and click OK.

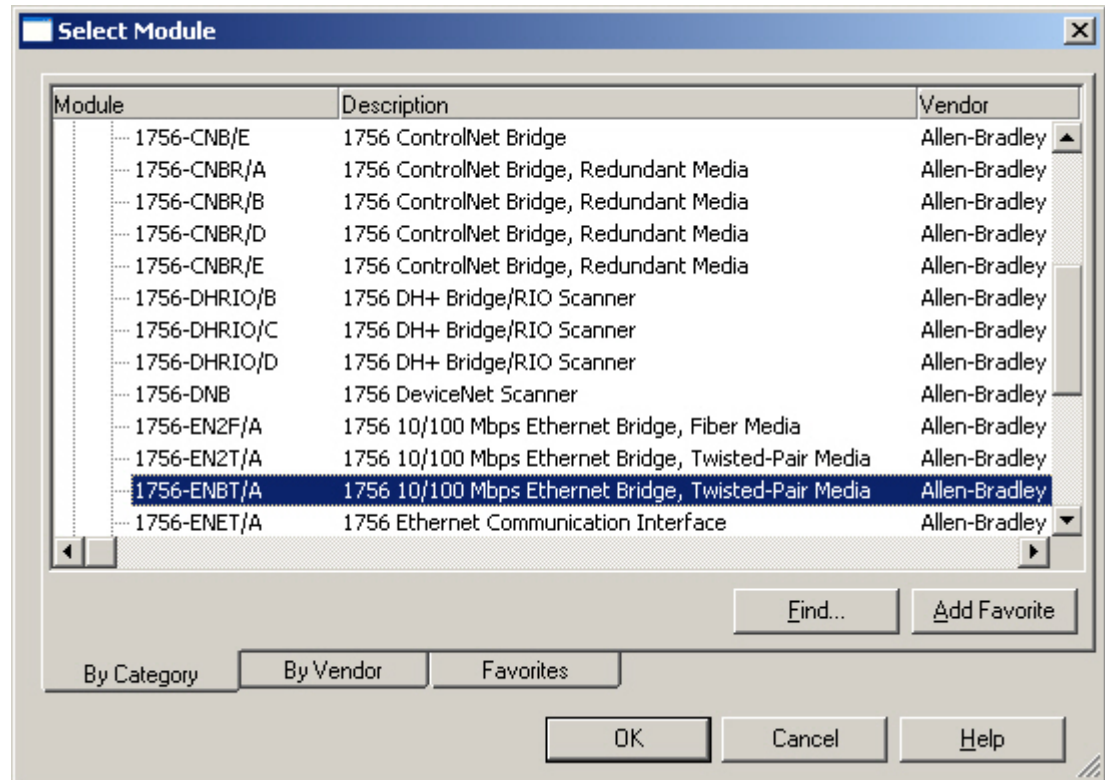
The 'New Controller' dialog box is shown with the following configuration:

- Vendor: Allen-Bradley
- Type: 1756-L63 ControlLogix5563 Controller
- Revision: 17
- Redundancy Enabled
- Name: CLX\_PointIO
- Description: (empty text area)
- Chassis Type: 1756-A4 4-Slot ControlLogix Chassis
- Slot: 2
- Safety Partner Slot: (unchecked)
- Create In: C:\RSLogix 5000\Projects

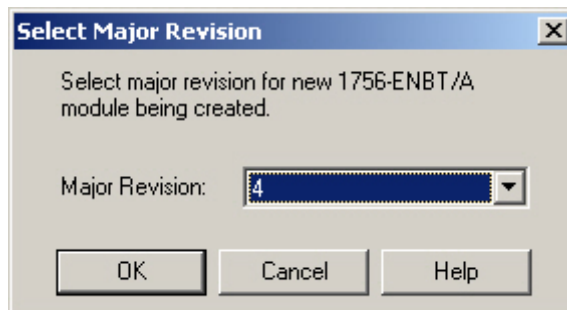
4. In the Controller Organizer, right-click 1756-Backplane and choose New Module.



- In the Select Module dialog box, click the + sign to expand Communications and select the 1756-ENBT/A module.



- Click OK.
- In the Select Major Revision dialog box, choose 4 and click OK.



- In the New Module dialog box, type the module name and choose slot 3.

**New Module**

Type: 1756-ENBT/A 1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media Change Type... ←

Vendor: Allen-Bradley

Parent: Local

Name: Local\_ENet\_Bridge

Description:

Slot: 3

Revision: 4 1

Electronic Keying: Compatible Keying

Address / Host Name:

IP Address:

Host Name:

Open Module Properties

OK Cancel Help

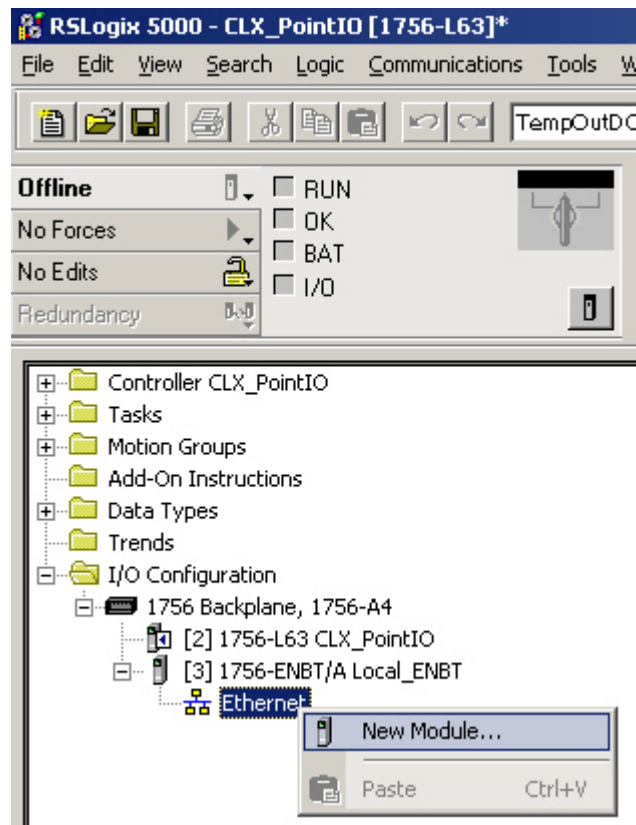
- Click OK.

The 1756-ENBT module appears in the controller organizer with Ethernet displayed below it.

## Configure the 1734-AENT Adapter

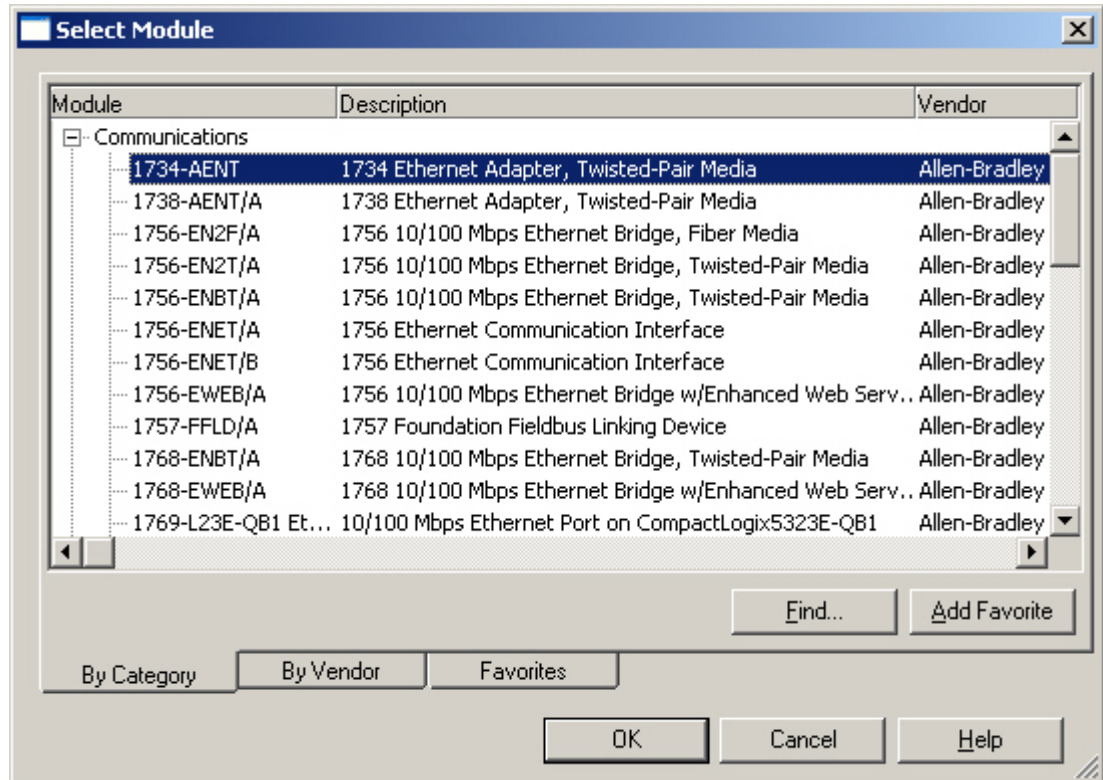
Follow these steps to add the 1734-AENT Ethernet Adapter to your controller project.

1. Right-click Ethernet and choose New Module.

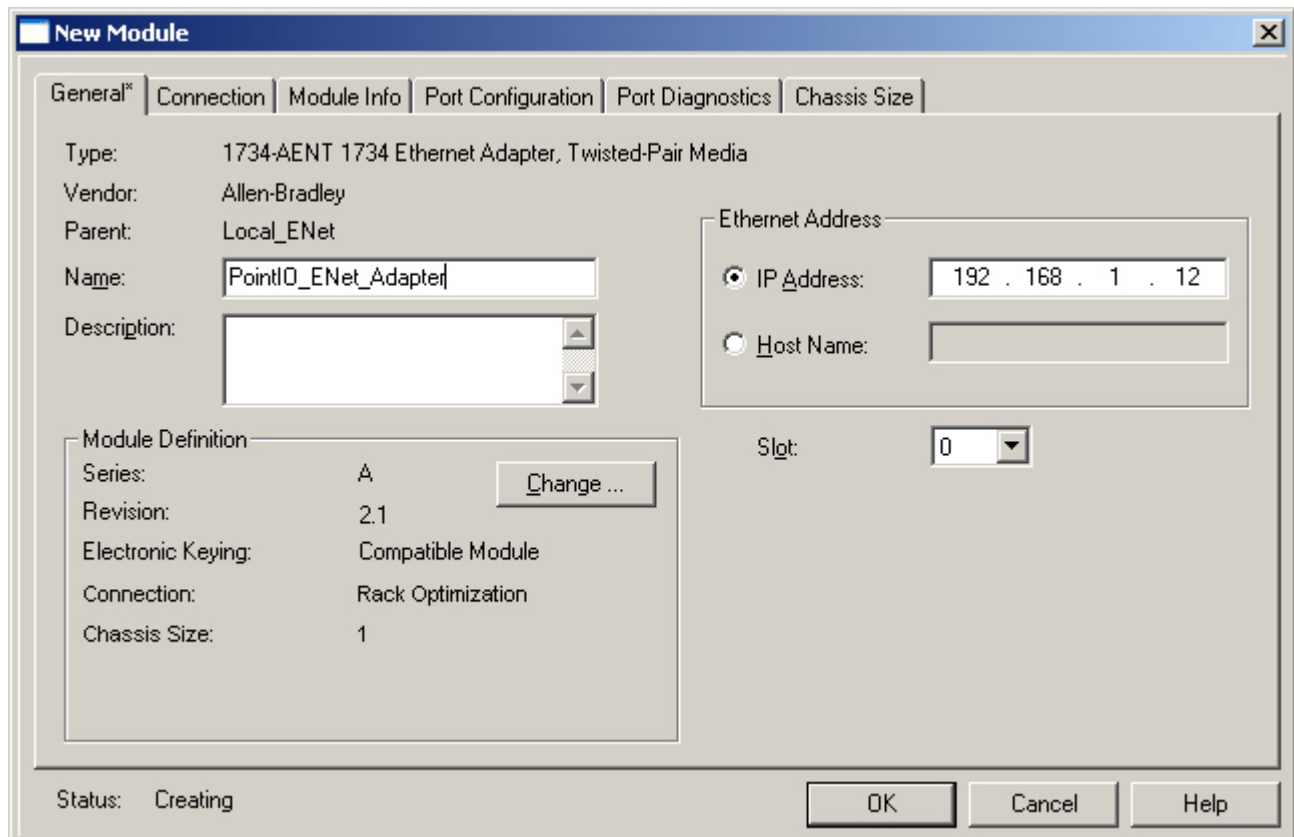




- In the Select Module dialog, click the + sign to expand Communications and then select the 1734-AENT adapter.



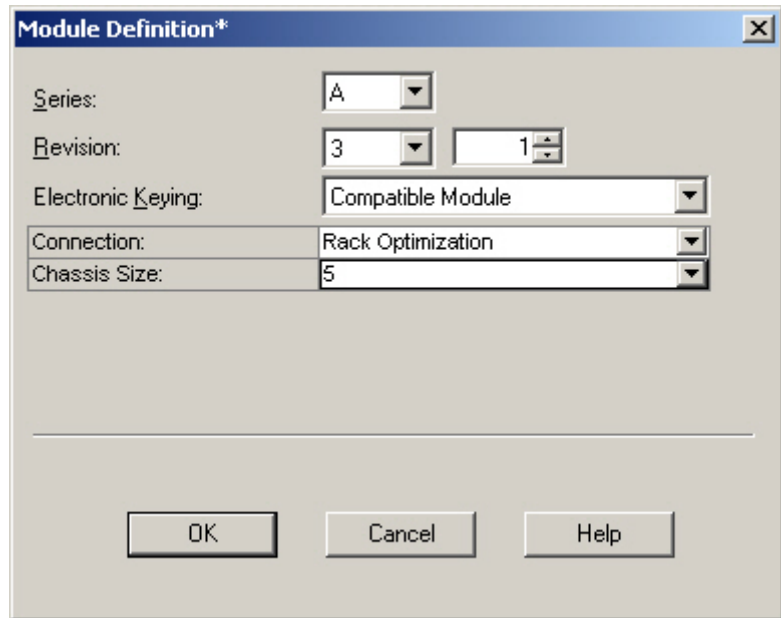
- In the New Module dialog box, type the module name and IP address.



- Click Change.



5. In the Module Definition dialog box, change the Major Revision to 3 and the Chassis Size to 5.



The 1734-AENT must be set to major firmware version 3 or later to communicate with POINT I/O modules. The chassis size of 5 reflects the 4 POINT I/O modules in addition to the 1734-AENT adapter.

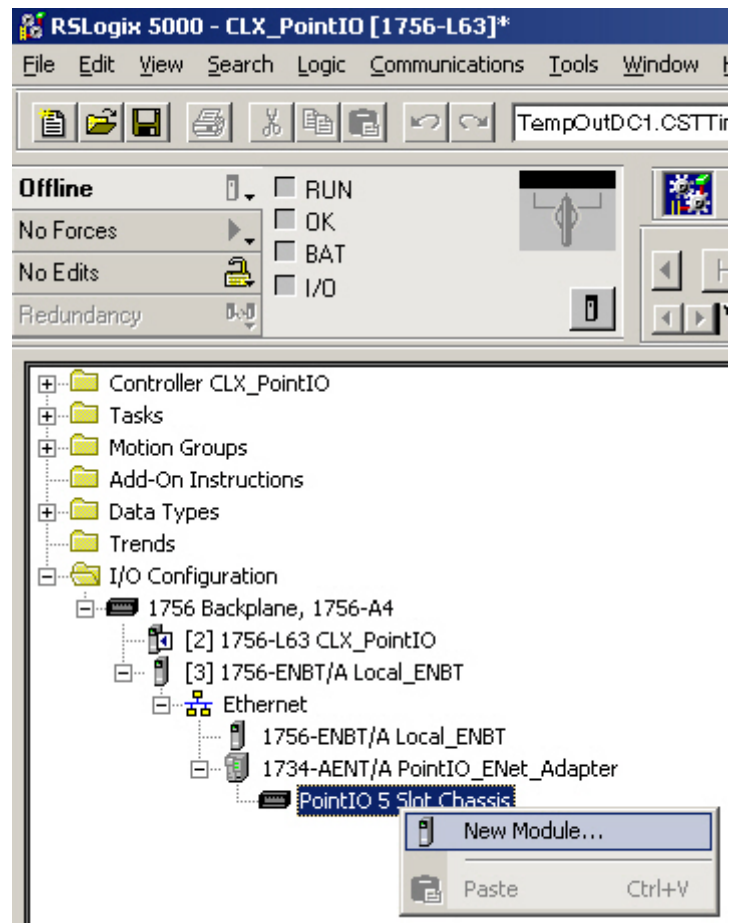
6. Click OK.
7. At the prompt, click Yes.
8. On the New Module Properties dialog box, click OK.

The 1734-AENT adapter appears in the Controller Organizer with the PointIO 5 Slot Chassis backplane displayed below it.

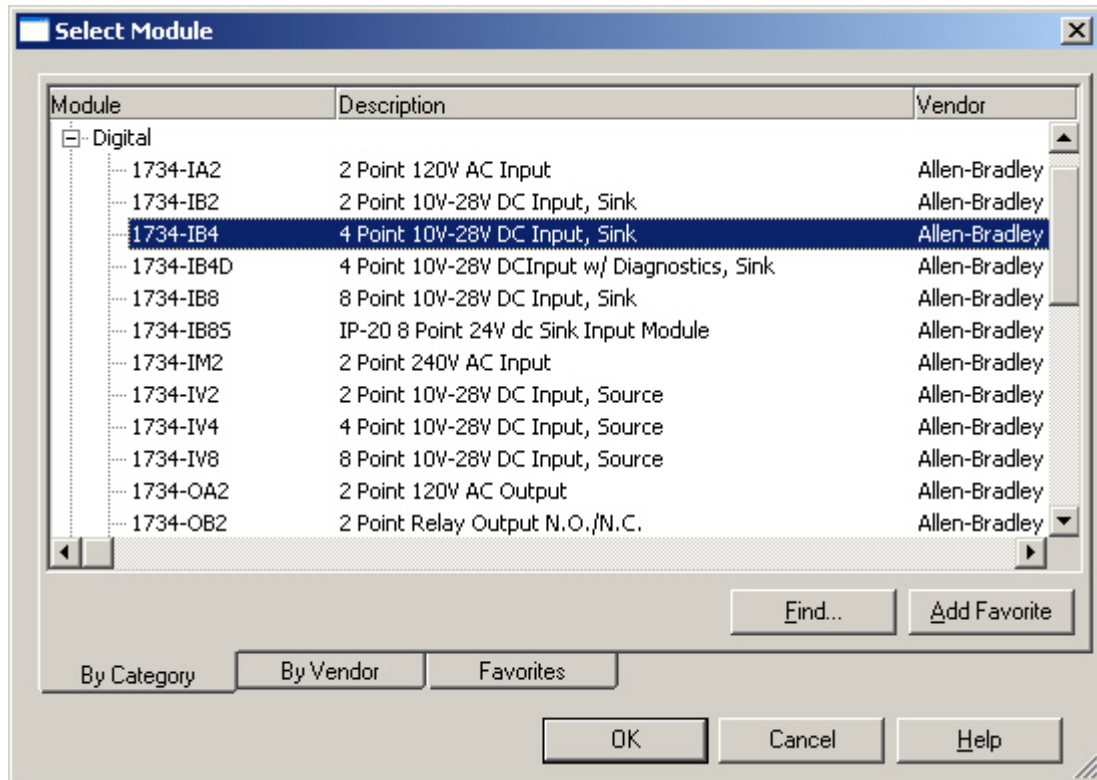
## Configure the POINT I/O Modules

Follow these steps to add the 1734-IB4 and 1734-OB8 modules to the POINT I/O backplane.

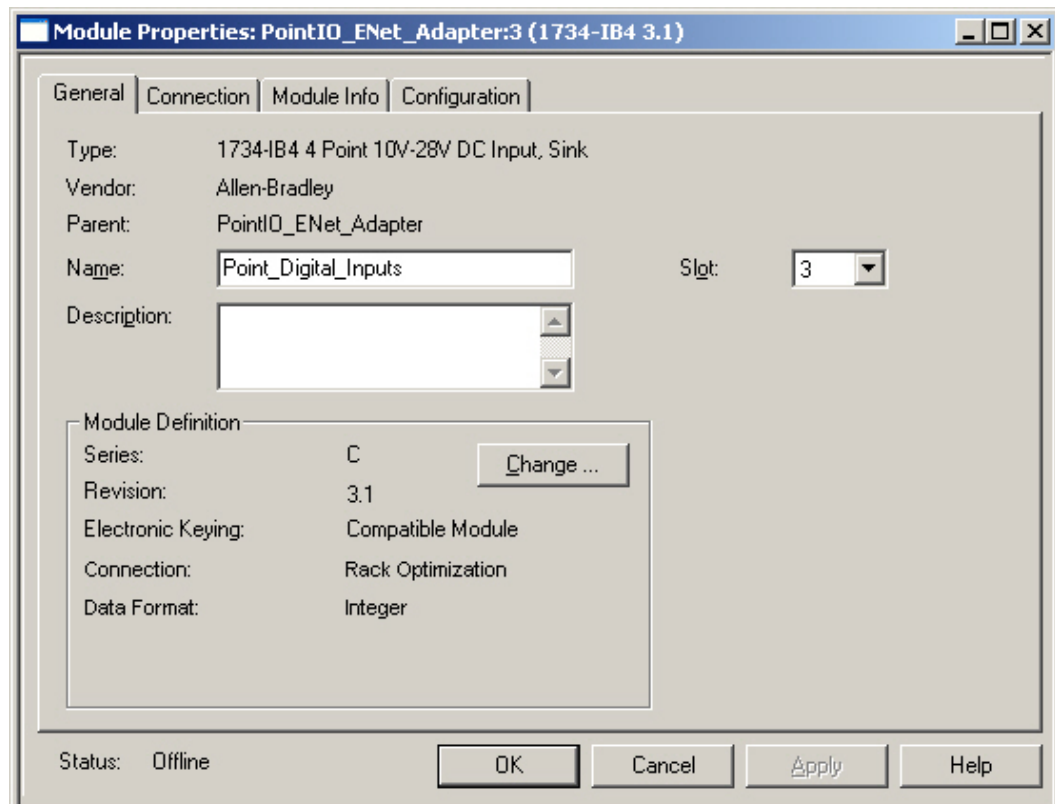
1. Right-click PointIO 5 Slot Chassis and choose New Module.



- In the Select Module dialog box, click the + sign to expand Digital and select the 1734-IB4 module.

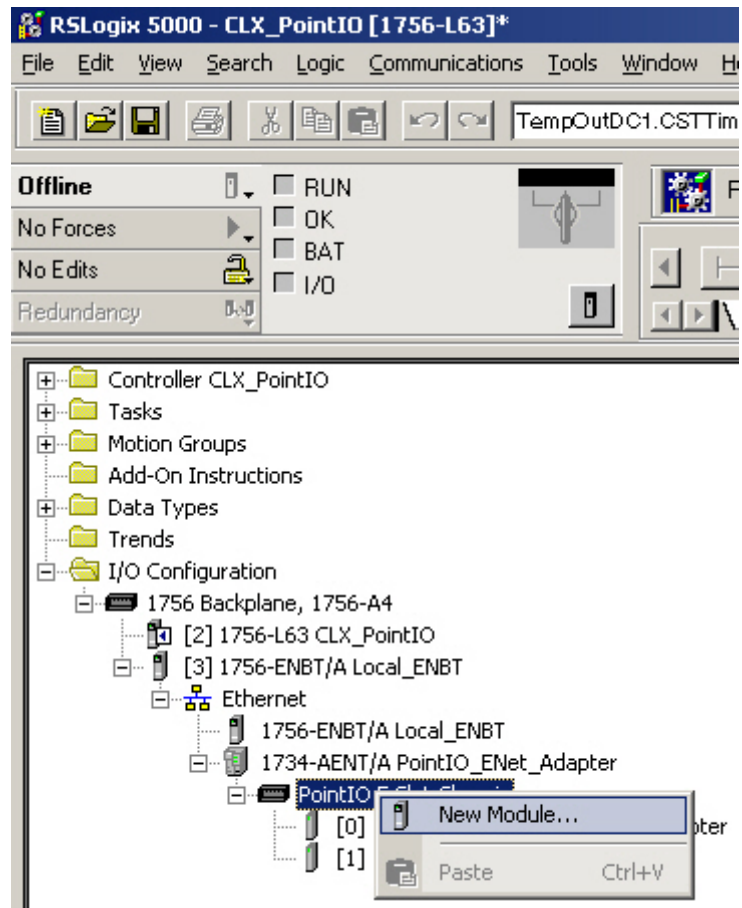


- Click OK.
- In the New Module dialog box, type a name for the 1734-IB4 module and click OK.

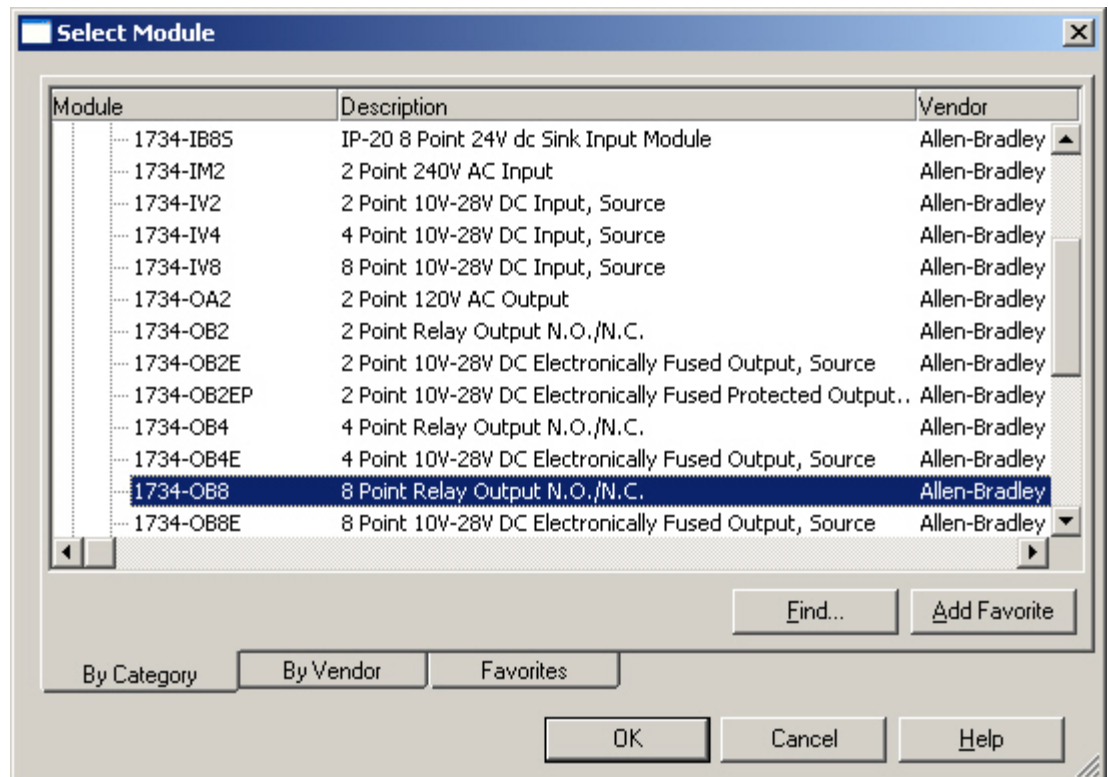


The 1734-IB4 module appears in the Controller Organizer.

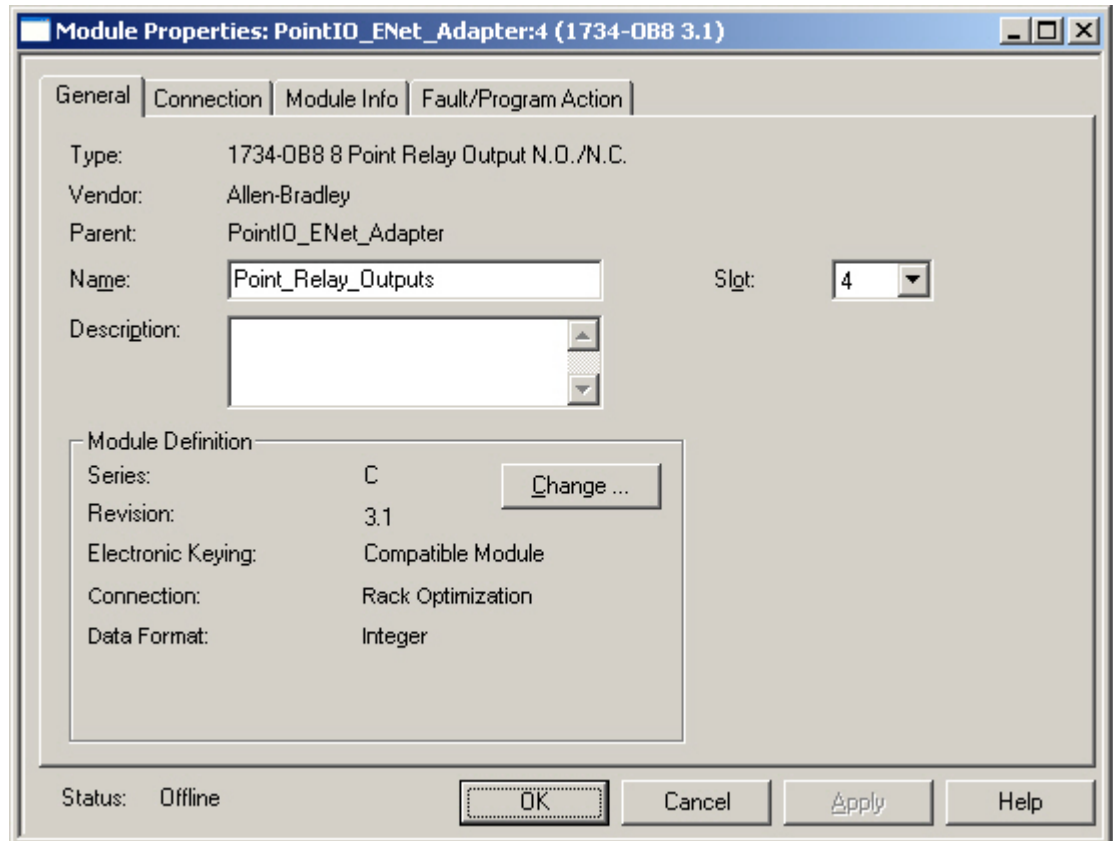
- Right-click PointIO 5 Slot Chassis and choose New Module.



- In the Select Module dialog box, click the + sign to expand Digital and select the 1734-OB8 module.



7. In the New Module dialog box, type a name for the 1734-OB8 module and click OK.

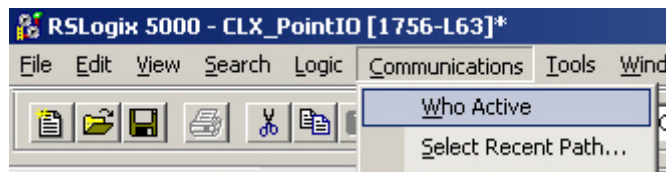


The 1734-OB8 module appears in the Controller Organizer.

## Establish Communication and Download the ControlLogix Project

Follow these steps to download your project.

1. From the Communications menu, choose Who Active.



2. From the Who Active dialog box, navigate to the 1756-L63 controller and click Download.
3. Place the Controller in Remote Run mode.

## Performance Data

The total number of safety, digital, analog, and specialty POINT I/O modules that can be added to a 1734-AENT adapter is limited by number of connections used.

The total number of connections that a 1734-AENT adapter can support is 20.

The number of connections consumed by each module is defined in this table.

<b>POINT I/O Connection Consumption</b>		
<b>Module</b>	<b>Connection Type</b>	<b>Connections Used</b>
Digital I/O	Direct	1 per module
Digital I/O	Rack Optimization	2 connections total
Analog I/O	Direct	1 per module
Specialty I/O	Direct	1 per module
1734-OB8S	Input/Output Data	2 per module
1734-IB8S	Input/Output Data	2 per module
1734-IB8S	Input Data Only	1 per module

## Additional Resources

For more information about the products used in this example, refer to these resources.

Resource	Description
POINT Guard I/O Safety Modules Installation & User Manual, publication <a href="#">1734-UM013</a>	Provides installation and operation information for the POINT Guard I/O Modules.
GuardLogix Controllers User Manual, publication <a href="#">1756-UM020</a>	Provides information on operating a GuardLogix Controller
GuardLogix Controller Systems Safety Reference Manual, publication <a href="#">1756-RM093</a>	Provides information on safety requirements for safety systems that use GuardLogix controllers.
ControlLogix Controllers User Manual, publication <a href="#">1756-UM001</a>	Provides information on using a ControlLogix controller.
POINT I/O Input Modules Installation Instructions, publication <a href="#">1734-IN051</a>	Provides information on mounting and wiring POINT I/O input modules
POINT I/O Output Modules Installation Instructions, publication <a href="#">1734-IN018</a>	Provides information on mounting and wiring POINT I/O output modules

You can view or download publications at <http://literature.rockwellautomation.com>. To order paper copies of technical documentation, contact your local Rockwell Automation distributor or sales representative.

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