Allen-Bradley

POINT I/O EtherNet/IP Adapter Module

1734-AENT

User Manual

Rockwell Automation

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Rockwell Automation be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Rockwell Automation office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard:

WARNING

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.

ATTENTION

Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

What this Preface Contains

This preface describes how to use this manual. The following table lists where to find specific information within this chapter.

Who Should Use This Manual

This manual is intended for control engineers and technicians who are installing, configuring, and maintaining an EtherNet/IP control system that communicates with POINT I/O through a 1734-AENT adapter. We assume you have a good understanding of Ethernet and the TCP/IP protocol.

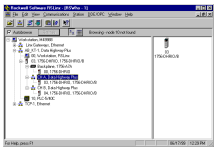
ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Common Techniques Used in This Manual

The following conventions are used throughout this manual:

- Numbered lists provide sequential steps.
- Bulleted lists provide information, not procedural steps.
- Information in **bold** text identifies menu windows, screen options, screen names, or areas of the screen, such as dialog boxes, status bars, radio buttons, and parameters.



The screen captures shown in this manual are pictures of the software's actual screens.

TIP This symbol identifies helpful tips.

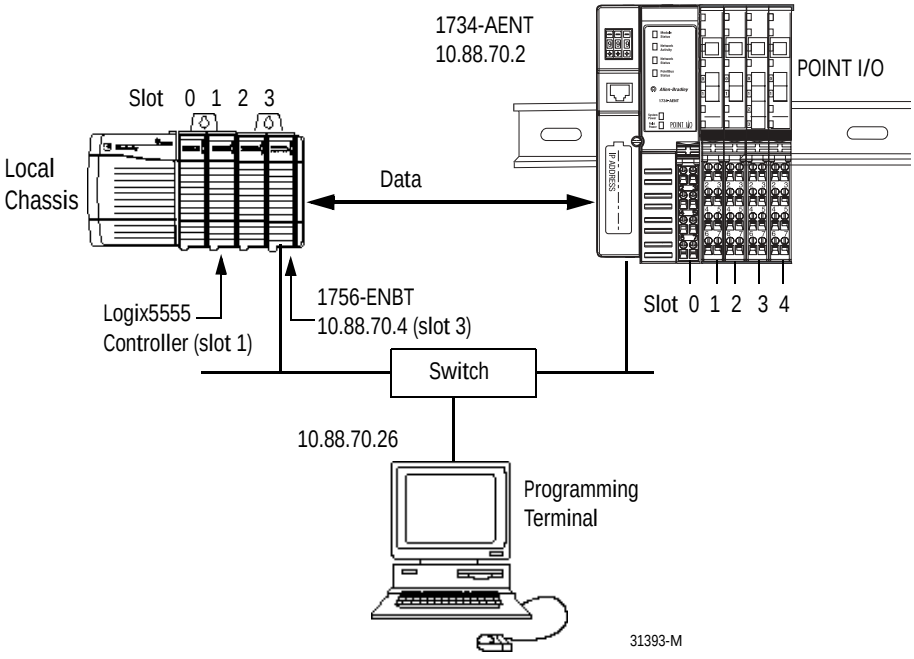
How To Use This Manual

This manual contains an overview of the 1734-AENT adapter. It describes how to install and configure the adapter, and provides examples showing how to use the adapter to communicate with POINT I/O over an EtherNet/IP network.

About the Example Applications

This manual presents two example applications that demonstrate the procedures for configuring and communicating with POINT I/O using the 1734-AENT adapter. The example applications are intended as building blocks to help you get your own system up and running. We recommend that you set up and run the example applications and use them as guides.

Here is the type of system you'll be setting up:



System Components

We used the following components for the example applications. You will need the same or similar components to set up your own control system using PONT I/O on EtherNet/IP.

Quantity	Product Name	Catalog Number	Part Number
	Hardware		
1	POINT I/O EtherNet/IP Adapter	1734-AENT	
1	POINT I/O 24V dc Sink Output Module	1734-OV4E/C	
1	POINT I/O Relay Output Module	1734-OW2/C	
1	DIN Rail	199-DR1 or equivalent	
1	ControlLogix chassis	1756-A4, (or -A7, -A13, -A17)	
1	ControlLogix power supply	1756-PA72, (or -PB72)	
1	Logix5555 controller	1756-L55	
1	ControlLogix EtherNet/IP Bridge Module	1756-ENBT	
1	Personal computer that supports RSLogix 5000 software	Any appropriate model running Windows NT 4.0, Service Pack 6A or higher	
1	Ethernet switch	Refer to manufacturer's specifications	
1	24V dc power supply	1734-EP24DC	
	Associated media and connectors as needed		
	Software		
1	RSLinx communications software, V2.31.00 or higher	9355-WAB, -WABOEM, -WABC	
1	RSLogix 5000 programming software, V11.11 or higher	9324-RLD300ENE	

Where to Find More Information

Refer to the following Rockwell publications as needed for additional help when setting up and using your EtherNet/IP network.

For information about	See this publication	Publication number
Using EtherNet/IP for industrial control	EtherNet/IP Performance and Application Guide	ENET-AP001
EtherNet/IP media	EtherNet/IP Media Planning and Installation Guide	ENET-IN001
Ethernet communication interface modules	Ethernet Communication Interface Module Installation Instructions	1756-5.3
	Ethernet Communication Interface Module User Manual	1756-6.5.1
	Ethernet Communication Interface Module Installation Instructions	1756-IN053
	Ethernet Communication Interface Module User Manual	1756-UM051
	Ethernet Communication Interface Module Release Notes	1756-RN053
ControlLogix chassis	ControlLogix Chassis Installation instructions	1756-IN080 (Series B)
ControlLogix power supplies	ControlLogix Power Supplies Installation Instructions	1756-5.67 (PA72/PB72) 1756-5.78 (PA75/PB75)
Logix5555 programmable controllers	Logix5555 Controller User Manual	1756-UM523
SoftLogix5800 Controller	SoftLogix5800 User Manual	1789-UM002 (L10, L30, L60) 1789-UM001 (SL5, SL51, SL52)
ControlLogix EtherNet/IP bridge module with firmware version 2.3 or higher	ControlLogix EtherNet/IP Bridge Module Installation Instructions	1756-IN019
	ControlLogix EtherNet/IP Bridge Module User Manual	1756-UM050
RSLogix 5000 programming software	Getting Results with RSLogix 5000, version 3.2.1 or higher	9399-RLD300GR
RSLinx communications software	RSLinx Lite User's Guide	9399-WAB32LUG
1734-AENT Adapter	POINT I/O EtherNet/IP Adapter Installation Instructions	1734-IN590
POINT I/O DeviceNet Adapter	POINT I/O Quick Start	1734-QS001
POINT I/O digital and analog modules and PointBLOCK I/O modules	POINT I/O Digital and Analog Modules and PointBLOCK I/O Modules User Manual	1734-UM001
POINT I/O input and output modules	POINT I/O Technical Data	1734-TD002
POINT I/O interface modules	POINT I/O RS-232 ASCII Module User Manual	1734-UM009
	POINT I/O RS-232 ASCII Module Installation Instructions	1734-IN588
POINT I/O expansion power supply	POINT I/O 24V dc Expansion Power Supply Installation Instructions	1734-IN058
POINT I/O field potential distributor	POINT I/O Field Potential Distributor Installation Instructions	1734-IN059
POINT I/O input modules	POINT I/O 120V ac Input Module Installation Instructions	1734-IN010
	POINT I/O Input Module Installation Instructions	1734-IN051
POINT I/O input analog modules	POINT I/O 2-Input Analog Module Installation Instructions	1734-IN053
	POINT I/O 2 Voltage Input Analog Module Installation Instructions	1734-IN001
POINT I/O encoders/counter modules	POINT I/O Encoders/Counter Module User Manual	1734-UM006
	POINT I/O 5V Encoders/Counter Module Installation Instructions	1734-IN005
	POINT I/O 24V Encoders/Counter Module Installation Instructions	1734-IN006

For information about	See this publication	Publication number
POINT I/O 22V ac input module	POINT I/O 220V ac Input Module Installation Instructions	1734-IN008
POINT I/O RTD input module	POINT I/O RTD Input Module Installation Instructions	1734-IN012
POINT I/O isolated termocouple input module	POINT I/O Isolated Thermocouple Input Module	1734-IN011
POINT I/O termocouple and RTD input module	Thermocouple and RTD Input Module User Manual	1734-UM004
POINT I/O IV2 and IV4 input module	POINT I/O Input Module Installation Instructions	1734-IN052
POINT I/O 120/220V ac Output module	POINT I/O 120/220V ac Output Module Installation Instructions	1734-IN009
POINT I/O protected output module	POINT I/O Protected Output Module Installation Instructions	1734-IN056
	POINT I/O Protected Output Module Installation Instructions (OB2EP)	1734-IN586
POINT I/O current output analog module	POINT I/O 2 Current Output Analog Module Installation Instructions	1734-IN054
POINT I/O voltage output analog module	POINT I/O 2 Voltage Output Analog Module Installation Instructions	1734-IN002
POINT I/O protected sink output module	POINT I/O Protected Sink Output Module Installation Instructions	1734-IN585
POINT I/O 2 relay output module	POINT I/O 2 Relay Output Module Installation Instructions (OX2)	1734-IN587
	POINT I/O 2 Relay Output Module Installation Instructions (OW2)	1734-IN055
POINT I/O synchronous serial interface absolute encoder module	POINT I/O Synchronous Serial Interface Absolute Encoder Module	1734-UM007
POINT I/O cold junction compensation wiring base assembly	POINT I/O Cold Junction Compensation Wiring Base Assembly	1734-IN583
POINT I/O wiring base assembly	POINT I/O Wiring Base Assembly Installation Instructions	1734--IN013
Very high speed counter module	POINT I/O 24V dc Very High Speed Counter Module	1734-IN003
	POINT I/O 5V dc Very High Speed Counter Module	1734-IN004
	Very High Speed Counter Module User Manual	1734-UM003
RSLinx	RSLinx Getting Results Guide	LINX-GR001

TIP

Many of the above publications are available online from The Automation Bookstore and Manuals On-line:

http://www.theautomationbookstore.com

http://www.ab.com/manuals/.

TIP

Rockwell Software products contain extensive tutorials and help screens. We recommend that you use the tutorials and help screens to learn about these products.

For more information about Rockwell Software products, visit the Rockwell Software internet site:

http://www.software.rockwell.com.

Terminology

Refer to the table below for the meaning of common terms.

This term	Means
BootP	BootP (Bootstrap Protocol) is a low-level protocol that provides configurations to other nodes on a TCP/IP network. BootP configuration files let you automatically assign IP addresses to an Ethernet module (you can also obtain Subnet masks and gateway addresses from BootP).
bridge	A node between two similar communication subnets where protocol translation is minimal.
CIP	Control and Information Protocol, the EtherNet/IP application layer uses the “producer/consumer” networking model. In this model one producer broadcasts (multicasts) the data once to all the consumers. All consumers see the data simultaneously and may choose whether to consume (receive) the data or not. Delivery time is consistent, no matter how many consumers there are.
connection	The communication mechanism from the controller to another module in the control system, usually used to exchange I/O data.
consumer	A destination device in the CIP networking model. See CIP.
CSMA/CD	Carrier Sense Multiple Access/Collision Detection is the access method used in Ethernet. When a device wants to gain access to the network, it checks to see if the network is quiet (senses the carrier). If it is not, it waits a random amount of time before retrying. If the network is quiet and two devices access the line at exactly the same time, their signals collide. When the collision is detected, they both back off and each waits a random amount of time before retrying.
determinism	The ability to predict when information will be delivered. Important in time critical applications.
DHCP	The Dynamic Host Configuration Protocol is an Internet protocol, similar to BootP, for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver IP stack configuration parameters, such as the subnet mask and default router, and to provide other configuration information, such as the addresses for printer, time and news servers. The 1734-AENT factory default is DHCP enabled. Upon powerup, the module sends a message containing its hardware address to any DHCP server on the network. The server(s) replies by sending a message with an appropriate IP address for the adapter. The adapter responds by acknowledging to a server that it will use the offered IP address.
DNS	The Domain Name System is a hierarchical, distributed method of organizing the name space of the Internet. The DNS administratively groups hosts into a hierarchy of authority that allows addressing and other information to be widely distributed and maintained. A big advantage to the DNS is that using it eliminates dependence on a centrally-maintained file that maps host names to addresses.
Ethernet	A physical layer standard using Carrier Sense Multiple Access with Collision Detection (CSMA/CD) methods.
EtherNet/IP	Ethernet Industrial Protocol applies a common application layer (CIP) over Ethernet by encapsulating messages in TCP/UDP/IP.

This term	Means
Ethernet network	A local area network designed for the high-speed exchange of information between computers and related devices.
explicit messaging	Non-time critical messaging used for device configuration and data collection, such as downloading programs or peer-to-peer messaging between two PLCs.
full duplex	A mode of communication that allows a device to send and receive information at the same time, effectively doubling the bandwidth.
fully qualified domain name	A Fully Qualified Domain Name (FQDN) is a domain name that includes all higher level domains relevant to the entity named. If you think of the DNS as a tree-structure with each node having its own label, a Fully Qualified Domain Name for a specific node would be its label followed by the labels of all the other nodes between it and the root of the tree. For example, for a host, a FQDN would include the string that identifies the particular host, plus all domains of which the host is a part, up to and including the top-level domain (the root domain is always null). For example, PARIS.NISC.SRI.COM is a Fully Qualified Domain Name for the host at 192.33.33.109.
gateway	A module or set of modules that allows communications between nodes on dissimilar networks.
hardware address	Each Ethernet device has a unique hardware address (sometimes called a MAC address) that is 48 bits. The address appears as six digits separated by colons (i.e., xx:xx:xx:xx:xx:xx). Each digit has a value between 0 and 255 (0x00 to 0xFF). This address is assigned in the hardware and cannot be changed. The hardware address is required to identify the device if you are using a BOOTP utility.
host name	The Host Name is the unique name for a computer within its domain. It's always the first element of a full name, and, with its domain and top-level domain suffix, creates the unique name of that computer on the Internet. For example, let's say a trading website is www.trading.com. The Host Name is “www”, which is not unique on the web, but is unique within the trading domain. The Host Name can also refer to the Fully Qualified Domain Name (FQDN), or in this example, www.trading.com. Both naming methods seem to be used interchangeably in various documents. For the purposes of this document, the Host Name will refer to the FQDN, or as in this example, www.trading.com.
hub	A central connecting device that joins devices together in a star configuration. Hubs are generally not suitable for use in I/O control systems, since they are time critical applications that cannot tolerate lost packets.
implicit messaging	Real time messaging of I/O data.
IP	Internet Protocol that provides the routing mechanism for messages. All messages contain not only the address of the destination station, but the address of a destination network, which allows messages to be sent to multiple networks within an organization or around the world.
IP address	A 32-bit identification number for each node on an Internet Protocol network. These addresses are represented as four sets of 8-bit numbers (numbers from 0 to 255), with decimals between them. Each node on the network must have a unique IP address.

This term	Means
latency	The time between initiating a request for data and the beginning of the actual data transfer.
multicast	In the CIP producer/consumer model one producer multicasts (broadcasts) the data once to all the consumers.
producer	The source of information in the CIP networking model. See CIP.
rack optimized	A physical and logical collection of application modules.
subnet mask	An extension of the IP address that allows a site to use a single net ID for multiple networks.
switch	A network device that cross connects devices or network segments. A switch provides each sender/receiver the full network bandwidth (2x in full duplex mode), reduces collisions, and increases determinism.
TCP	The Transport Control Protocol is a more reliable but slower transport protocol than UDP. It is used for explicit (not time critical) messaging in EtherNet/IP.
TCP/IP	The Transmission Control Protocol/Internet Protocol is a transport-layer protocol (TCP) and a network-layer protocol (IP) commonly used for communication within networks and across internetworks.
transaction	An exchange of request and data and response and data.
UDP	The User Datagram Protocol is a transport protocol that provides a very simple but fast capability to send datagrams between two devices. It is used for I/O (implicit) messaging in EtherNet/IP.

Chapter 1

About the 1734-AENT Adapter

Chapter 2

Install the 1734-AENT Adapter

Chapter 3

Configure the 1734-AENT Adapter for Your EtherNet/IP Network

Chapter 4

Configure the 1734-AENT for Direct Connection in RSLogix 5000

Chapter 5

Configure the 1734-AENT for Direct Connection and Rack Optimization in RSLogix 5000

Chapter 6

LED Status Indicators

Chapter 7

Safety Approvals and Specifications

About the 1734-AENT Adapter

What This Chapter Contains

This chapter provides an overview of the 1734-AENT POINT I/O EtherNet/IP adapter, its primary features, and how to use it. You will need to understand the concepts discussed in this chapter to configure your adapter and use it in an EtherNet/IP control system. The following table lists where to find specific information in this chapter.

ATTENTION

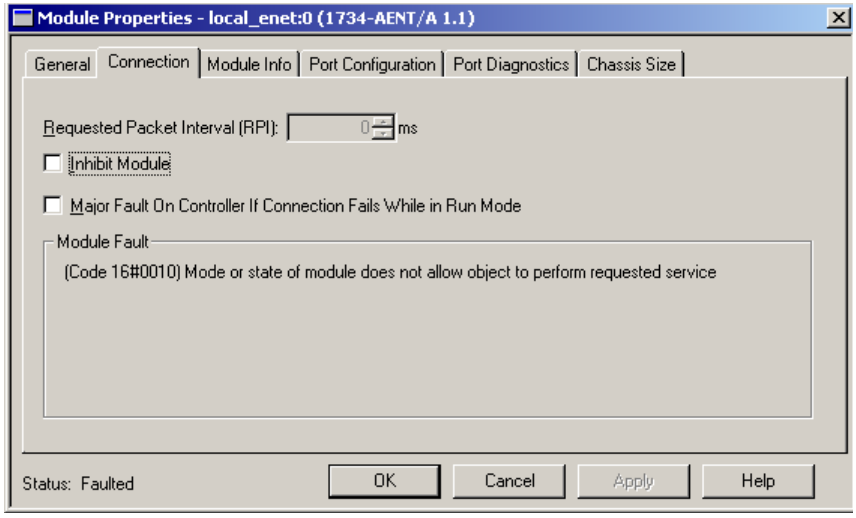
You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Important Adapter Considerations

Before you begin using your 1734-AENT, please note the following important considerations.

Set the Chassis Size

The 1734-AENT POINT I/O adapter for EtherNet/IP requires its chassis size to be configured before any I/O connections can be made. The default setting for the chassis size is 1 slot which represents the adapter by itself. You must set the chassis size to a number equaling 1 slot for the adapter plus 1 slot for each I/O module present in the adapter's backplane (e.g., the adapter plus 4 I/O modules will use a chassis size of 5). The adapter stores this chassis size setting in non-volatile storage. When the adapter's non-volatile chassis size does not match the actual number of modules present on its backplane, the adapter will not make any I/O connections and the following error will occur.



Adapter replacement

It is important to note that during a connection request from the controller, the chassis size setting for a 1734-AENT is not communicated to the adapter. This chassis size must always be set using a separate operation. This includes situations when an adapter is being replaced. The adapter will not make any I/O connections until it has been configured with the appropriate chassis size.

Empty Slots and RIUP Situations

The POINT I/O system does not have the ability to detect an empty terminal base. Because of this, there are numerous situations in which you can potentially configure a system that is unusable or one that exercises unintended control. In an attempt to address these situations, you must observe the following rules for POINT I/O system construction and the removal and reinsertion of modules.

- **A correct POINT I/O system does not have any empty terminal bases**.
- **After power up, the adapter will not run any I/O until the number of modules comprising the "chassis" equals the stored "chassis size".** Because the adapter cannot detect empty terminal bases, it cannot assume any safe operation until there is a "match" between the number of modules indicating their presence in the chassis and what the adapter has saved in non-volatile memory. Actual module identification (i.e., electronic keying) will be done when connection establishment requests are received from the controller(s).
- **A module removed under power will not disrupt operation of the other I/O modules.** When a module is removed, the adapter will determine what has changed. Whenever a module with an active connection is removed from the POINT I/O system, the adapter will indicate this by flashing the PointBus Status LED red and report a minor recoverable fault.
- **If more than one contiguous module is removed under power, connections to all modules in the contiguous missing module set will be disallowed until all modules are replaced.** Because the adapter cannot detect an empty base, it does not know the physical positioning of the modules until all the missing modules are replaced.
- **If a module separating two sets of contiguous missing modules is removed, the two sets merge into a single set.** All the modules must be replaced before connections are permitted to any module in the set.
- **If modules of different types are removed and returned to the wrong locations, attempts to connect to these modules will fail** during verification of the electronic ID (providing that keying has not been disabled).
- **If modules of the same type are removed and returned to the wrong locations, they will accept connections** from the controller(s) and be reconfigured with the correct data once they pass their electronic keying check.
- **The above mentioned removal and return situations exist whether the system is under power or not.** If the system is under power, the situation arises immediately. If the system is not under power, the situation arises in the next power cycle.

Power Up a System For the First Time

When POINT I/O is powered for the first time, the adapter must assign addresses to every module in the backplane. POINT I/O modules all ship configured at the same address. Therefore, at first power up, it is expected that all but one module on the backplane will exhibit a solid red Module Status LED. One by one the adapter will reset these modules and address them appropriately. The amount of time that this operation takes is proportional to the size of your POINT I/O system.

Adapter Features

The 1734-AENT adapter's features include:

- use of EtherNet/IP messages encapsulated within standard TCP/UDP/IP protocol
- common application layer with ControlNet and DeviceNet
- interfacing via Category 5 rated twisted pair cable
- half/full duplex 10 Mbit or 100 Mbit operation
- DIN rail mounting
- communication to and from other POINT I/O modules on the same DIN rail
- communication supported by RSLinx software
- IP address assigned via standard BootP or DHCP tools
- I/O configuration via RSLogix 5000 software
- no network scheduling required
- no routing tables required
- supports connections from multiple controllers simultaneously

Hardware/Software Compatibility

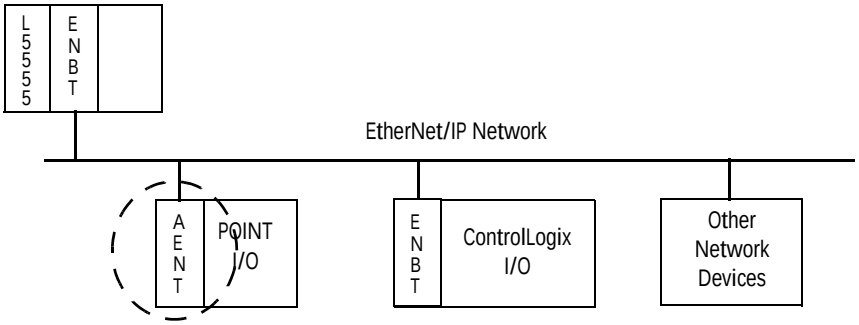
The 1734-AENT adapter and the applications described in this manual are compatible with the following firmware versions and software releases. Contact Rockwell Automation if you need software or firmware upgrades to use this equipment.

Product	Firmware Version/ Software Release
1734-AENT Adapter	1.xx or higher
1756-ENBT	2.3 or higher
Logix 5555 Controller	11 or higher
RSLogix 5000 software	11.11 or higher
RSLinx software	2.3.1 or higher

What the Adapter Does

The 1734-AENT adapter performs two primary tasks:

1. Control of real time I/O data (also known as “implicit messaging”). The 1734-AENT adapter serves as a bridge between POINT I/O modules and the network.



2. Support of messaging data for configuration and programming information (also known as “explicit messaging.”).

Use of the Common Industrial Protocol (CIP)

The 1734-AENT adapter uses the Common Industrial Protocol (CIP). CIP is the application layer protocol specified for EtherNet/IP, the Ethernet Industrial Protocol, as well as for ControlNet and DeviceNet. It is a message-based protocol that implements a relative path to send a message from the “producing” device in a system to the “consuming” devices.

The producing device contains the path information that steers the message along the proper route to reach its consumers. Since the producing device holds this information, other devices along the path simply **pass** this information; they do not need to **store** it.

This has two significant benefits:

- You do not need to configure routing tables in the bridging modules, which greatly simplifies maintenance and module replacement.
- You maintain full control over the route taken by each message, which enables you to select alternative paths for the same end device.

Understand the Producer/Consumer Model

The CIP "producer/consumer" networking model replaces the old source/destination ("master/slave") model. The producer/consumer model reduces network traffic and increases speed of transmission. In traditional I/O systems, controllers poll input modules to obtain their input status. In the CIP system, input modules are not polled by a controller. Instead, they produce ("multicast") their data either upon a change of state (COS) or periodically. The frequency of update depends upon the options chosen during configuration and where on the network the input module resides. The input module, therefore, is a producer of input data and the controller is a consumer of the data.

The controller can also produce data for other controllers to consume. The produced and consumed data is accessible by multiple controllers and other devices over the EtherNet/IP network. This data exchange conforms to the producer/consumer model.

Specify the Requested Packet Interval (RPI)

The RPI is the update rate specified for a particular piece of data on the network. The RPI can be specified for the adapter and include all of the I/O modules communicating through it (using a rack optimized connection) or specified for a particular module (using direct connection). When you add a module or an adapter to the I/O configuration of a controller, you must enter the RPI as a parameter. This value specifies how often to produce the data for that device. For example, if you specify an RPI of 50 ms, it means that every 50ms the device should send its data to the controller or the controller should send its data to the device.

RPIs are only used for devices that exchange data. For example, a ControlLogix EtherNet/IP bridge module in the same chassis as the controller does not require an RPI because it is not a data-producing member of the system; it is used only as a bridge to remote racks.

Support of Rack Optimized and Direct Connections

The 1734-AENT adapter supports both direct and rack optimized connections. A direct connection is a real-time data transfer link between the controller and whatever module occupies the slot that the configuration data references. Direct connection messaging occurs at a cyclic rate specified by the RPI during configuration. A rack optimized connection is a grouping of data

from more than one I/O module into a single block of data sent over a single connection at the same data rate.

Rack optimized connections reduce the total number of connections needed to transfer data when using many I/O modules in a system. The following example illustrates the benefit of rack optimized connections.

Assume you have set up a system that contains 8 discrete I/O modules interfaced to a 1734-AENT adapter. If you use direct connections to transfer data to each of the these I/O modules, you need 8 connections to transfer all of the data, one to each of the 8 I/O modules. If you use a rack-optimized connection to transfer the data, you only need a single connection – the connection to the 1734-AENT adapter.

IMPORTANT

Although rack optimized connections offer an efficient way to use resources, there are a few limitations on their use:

- You can only use rack optimized connections to send data to and from discrete I/O modules. Analog or speciality I/O requires direct connections.
- All data is sent at the same time at the RPI rate of the 1734-AENT adapter.

See the **EtherNet/IP Performance and Application Guide**, publication number ENET-AP001, for more information on connections.

Mix Rack Optimized and Direct Connections

You can mix communication formats for different I/O modules communicating through the same adapter. I/O modules set up to use rack optimization will communicate at the rate of the RPI configured for the 1734-AENT adapter. I/O modules configured for direct communication will communicate at their own set RPIs and ignore the 1734-AENT adapter's RPI.

What's Next?

The following chapter describes how to physically install the 1734-AENT adapter and connect it to the EtherNet/IP network.

Install the 1734-AENT Adapter

What This Chapter Contains

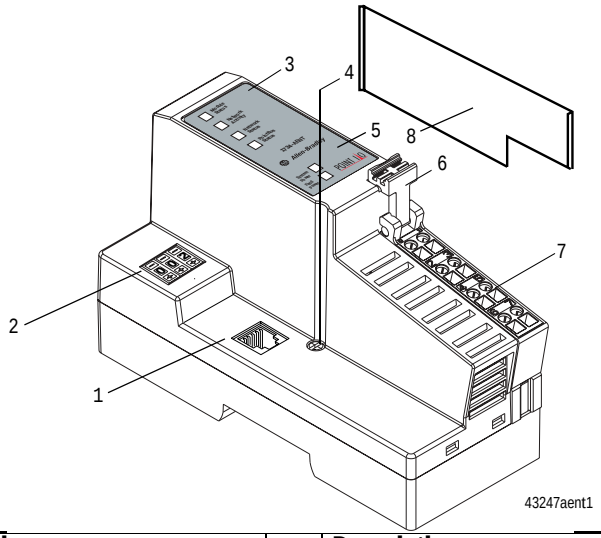
This chapter describes how to physically install the 1734-AENT adapter on the DIN rail and connect it to the EtherNet/IP network. The following table lists where to find specific information.

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Identify Module Components

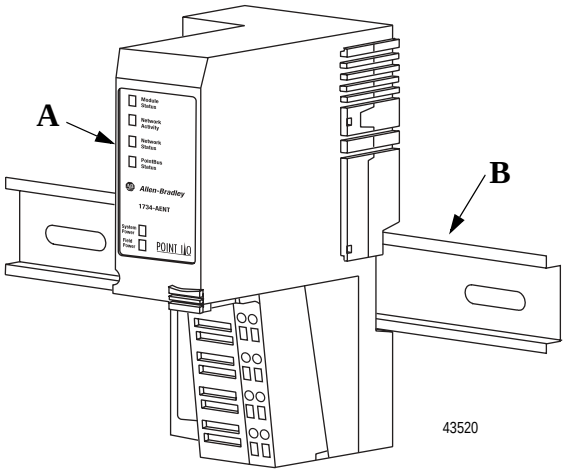
Use the following illustration to identify the external features of the POINT I/O EtherNet/IP adapter.



	Description		Description
1	Ethernet Network RJ45 Connector	5	System Power and Field Power Indicators
2	Network Address Thumbwheel	6	Removable Terminal Block (RTB) Handle
3	Indicators - Module Status, Network Activity, Network Status, and PointBus Status	7	Removable Terminal Block (RTB)
4	DIN Rail Locking Screw (orange)	8	Safety Endcap

Mount the Adapter on a DIN Rail Before Installing Modules

Use the following procedure to mount the adapter on a new system before any I/O modules have been installed.



1. Position the adapter (**A**) vertically above the DIN rail (**B**).
2. Press down firmly to install the adapter on the DIN rail. The locking mechanism will lock the adapter to the DIN rail.

3. Set the network address thumbwheel switches to the desired value (see **Set the Network Address** on page 3--6 in the next chapter).

WARNING

If you connect or disconnect the Ethernet cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

4. Slide the safety end cap up to remove it. This exposes the backplane and power interconnections.

ATTENTION

Do not discard the adapter's end cap. Use this end cap to cover the exposed interconnections on the last mounting base on the DIN rail. Failure to do so could result in equipment damage or injury from electric shock.

Mount (or Replace) EtherNet/IP Adapter to an Existing System

Follow the steps below to mount (or replace) an Ethernet adapter.

1. Remove the existing adapter (if there is one) from the DIN rail as follows:
   a. Pull up on the RTB removal handle to remove the terminal block.
   b. Disconnect the Ethernet connector from the adapter.
   c. Remove the adjacent module from its base.
   d. Use a small bladed screwdriver to rotate the DIN rail locking screw to a vertical position. This releases the locking mechanism.
   e. Lift straight up to remove.
2. For the replacement adapter, slide the safety end cap up to remove. This exposes the backplane and power connections.
3. Position the replacement adapter vertically above the DIN rail. (Make certain the DIN rail lock is in the horizontal position.) Slide the adapter down, allowing the interlocking side pieces to engage the adjacent module.
4. Press firmly to seat the adapter on the DIN rail. The adapter locking mechanism will snap into place.
5. Replace the adjacent module in its base.
6. Reconnect the Ethernet cable to the adapter.

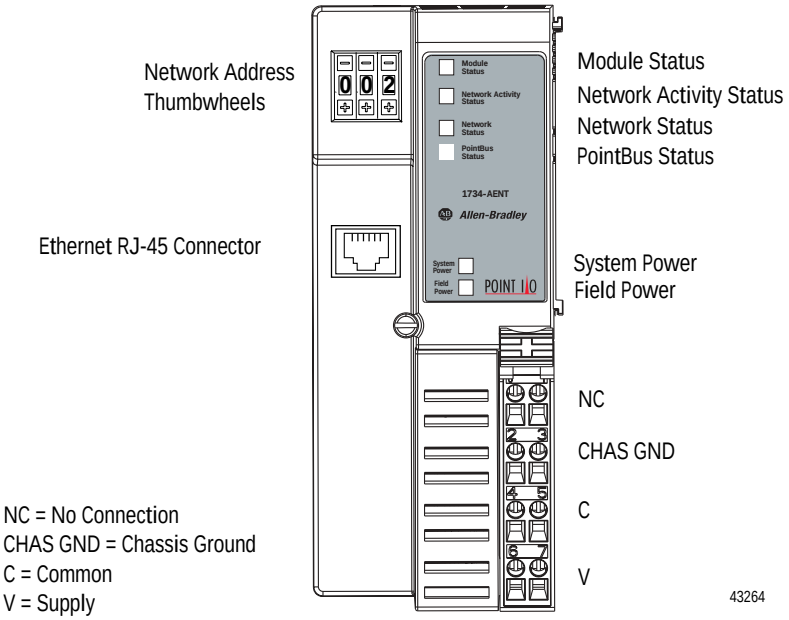
7. Set the network address thumbwheel switches to the value used on the replaced module (see **Set the Network Address** on page 3--6 in the next chapter).

8. Insert the end of the terminal block (RTB) opposite the handle into the base unit. This end has a curved section that engages with the wiring base.

9. Rotate the terminal block into the wiring base until it locks itself into place.

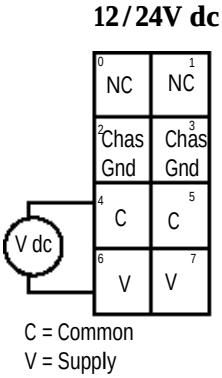
Wiring

Refer to the illustration to wire the Ethernet adapter

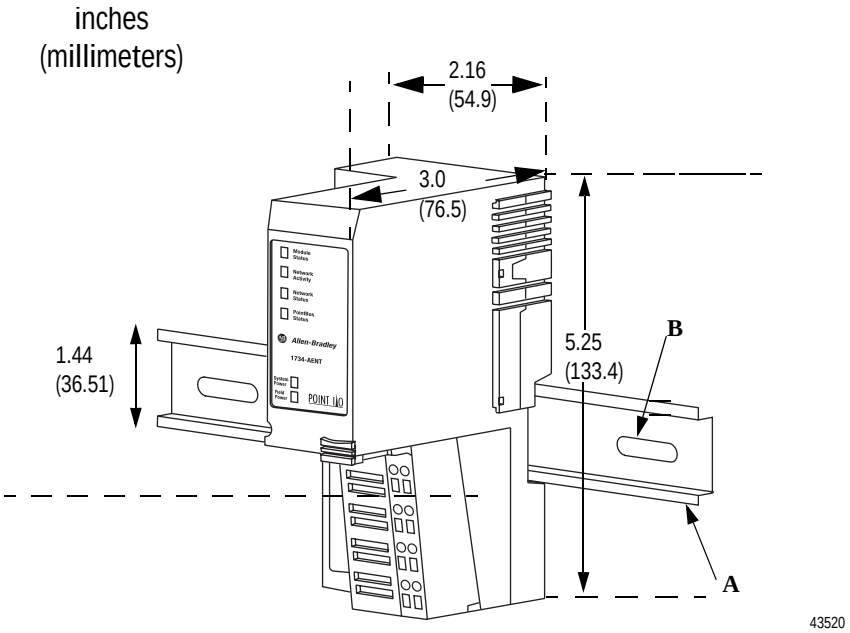


ATTENTION

Do not connect 120/240V ac power to this supply.



Mounting Dimensions



A = DIN rail
B = Secure DIN rail approximately every 200mm

1734-AENT
3.0H x 2.16W x 5.25D
(76.2H x 54.9W x 133.4D)

What's Next?

The following chapter describes how to configure the adapter to communicate on your EtherNet/IP network by providing an IP address, Gateway address, and Subnet mask.

Notes:

Configure the 1734-AENT Adapter for Your EtherNet/IP Network

What This Chapter Contains

Before you can use your 1734-AENT adapter in an EtherNet/IP network you must configure it with an IP address, Subnet mask, and optional Gateway address. This chapter describes these configuration requirements and the procedures for providing them. There are several way you can do this:

- Using the Rockwell BootP utility, version 2.3 or greater, that ships with RSLogix 5000 or RSLinx software. You can also use this utility to reconfigure a device whose IP address must be changed.
- Using a third party DHCP server.
- Using the Network Address thumbwheel switches.
- Having your network administrator configure the adapter via the network server.

The following table lists where to find specific information within this chapter.

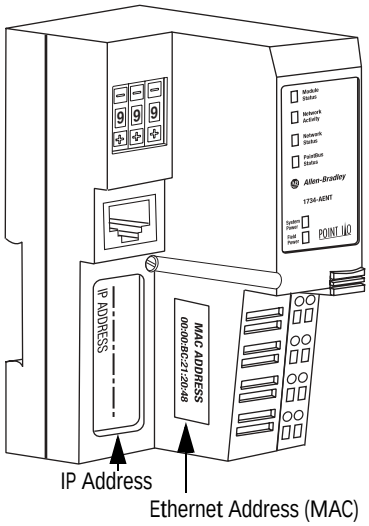
ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Configuration Requirements

Before you can use your 1734-AENT adapter, you must configure its IP address, its subnet mask, and optionally, gateway address. You can use the Rockwell BootP utility, version 2.3 or greater, to perform the configuration. You can also use a DHCP server or the network address switches to configure these parameters.

If the 1734-AENT needs to be reset to factory defaults, see the Important note on page A--9.



IMPORTANT

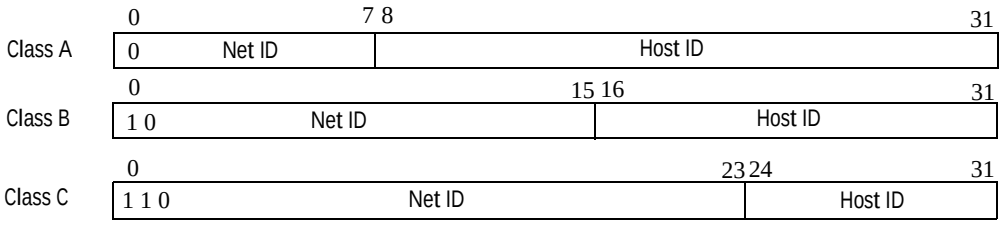
If using the BootP/DHCP utility, you will need to know the Ethernet hardware address of your adapter. Rockwell assigns each 1734-AENT adapter a unique 48-bit hardware address at the factory. The address is printed on a label on the side of your 1734-AENT adapter as shown in the figure at left. It consists of six hexadecimal digits separated by colons. This address is fixed by the hardware and cannot be changed.

If you change or replace the 1734-AENT adapter, you must enter the new Ethernet hardware address of the adapter when you configure the new adapter.

IP Address

The IP address identifies each node on the IP network (or system of connected networks). Each TCP/IP node on a network (including the 1734-AENT adapter) must have a unique IP address.

The IP address is 32 bits long and has a net ID part and a Host ID part. Networks are classified A, B, C, (or other). The class of the network determines how an IP address is formatted.



You can distinguish the class of the IP address from the first integer in its dotted-decimal IP address as follows:

Range of first integer	Class	Range of first integer	Class
0 -127	A	192 - 223	C
128 -191	B	224 - 255	other

Each node on the same physical network must have an IP address of the same class and must have the same net ID. Each node on the same network must have a different Host ID thus giving it a unique IP address.

IP addresses are written as four decimal integers (0-255) separated by periods where each integer gives the value of one byte of the IP address.

EXAMPLE

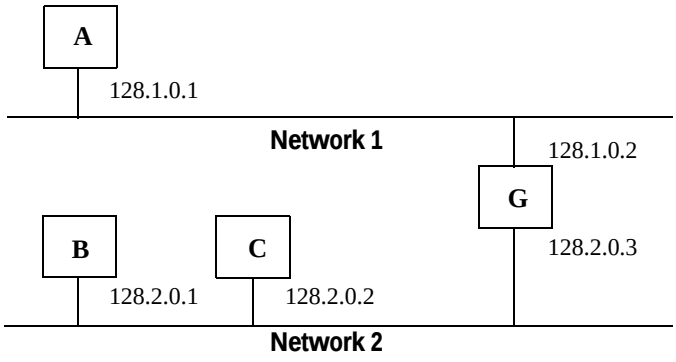
For example, the 32-bit IP address:

10000000 00000001 00000000 00000001 is written as 128.1.0.1.

Gateway Address

This section applies to multi-network systems. If you have a single network system, please skip to the next section.

The Gateway Address is the default address of a network. It provides a single domain name and point of entry to the site. Gateways connect individual physical networks into a system of networks. When a node needs to communicate with a node on another network, a gateway transfers the data between the two networks. The following figure shows gateway G connecting Network 1 with Network 2.



When host B with IP address 128.2.0.1 communicates with host C, it knows from C's IP address that C is on the same network. In an Ethernet environment, B can then resolve C's IP address into a hardware address (MAC address) and communicate with C directly.

When host B communicates with host A, it knows from A's IP address that A is on another network (the net IDs are different). In order to send data to A, B must have the IP address of the gateway connecting the two networks. In this example, the gateway's IP address on Network 2 is 128.2.0.3.

The gateway has two IP addresses (128.1.0.2 and 128.2.0.3). The first must be used by hosts on Network 1 and the second must be used by hosts on Network 2. To be usable, a host's gateway must be addressed using a net ID matching its own.

Subnet Mask

The Subnet Mask is used for splitting IP networks into a series of subgroups, or subnets. The mask is a binary pattern that is matched up with the IP address to turn part of the Host ID address field into a field for subnets.

EXAMPLE

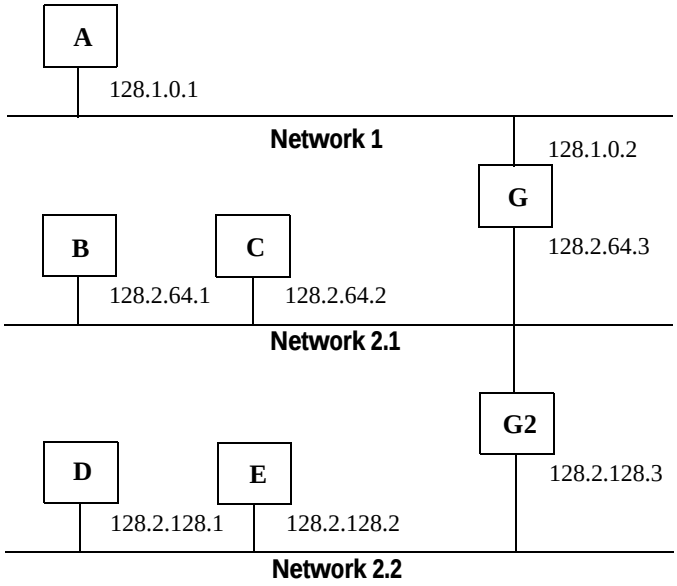
Take Network 2 (a Class B network) in the previous example and add another physical network. Selecting the following subnet mask would add two additional net ID bits, allowing for four physical networks:

11111111 11111111 **11**000000 00000000 = 255.255.192.0

These two bits of the Host ID used to extend the net ID

Two bits of the Class B host ID have been used to extend the net ID. Each unique combination of bits in the part of the Host ID where subnet mask bits are 1 specifies a different physical network.

The new configuration is:

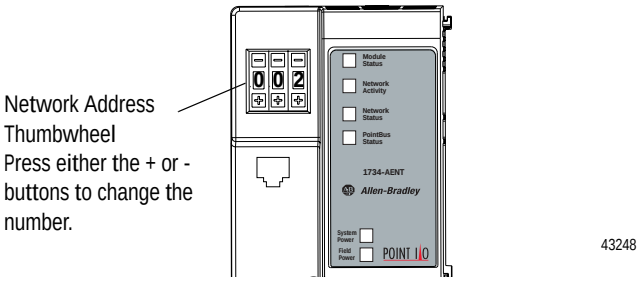


A second network with Hosts D and E has been added. Gateway G2 connects Network 2.1 with Network 2.2. Hosts D and E will use Gateway G2 to communicate with hosts not on Network 2.2. Hosts B and C will use Gateway G to communicate with hosts not on Network 2.1. When B is communicating with D, G (the configured Gateway for B) will route the data from B to D through G2.

Set the Network Address

You can set the network Internet Protocol (IP) address 3 different ways:

1. Using the thumbwheel switches located on the module
2. Using a Dynamic Host Configuration Protocol (DHCP) server, such as Rockwell Automation BootP/DHCP
3. Retrieving the IP address from nonvolatile memory.



The adapter reads the thumbwheel switches only at powerup to determine if the switches are set to a valid number. Press either the + or - buttons to change the number. Valid settings range from 001 to 254. When the switches are set to a valid number, the adapter's IP address will be 192.168.1.xxx (where xxx represents the number set on the switches). The adapter's subnet mask will be 255.255.255.0 and the gateway address is set to 0.0.0.0. The adapter will not have a host name assigned, or use any Domain Name System when using the thumbwheel settings.

If the switches are set to an invalid number (i.e. 000 or a value greater than 254), the adapter checks to see if DHCP is enabled. If DHCP is enabled, the adapter requests an address from a DHCP server. The DHCP server will also assign other Transport Control Protocol (TCP) parameters.

If DHCP is not enabled, the adapter will use the IP address (along with other TCP configurable parameters) stored in nonvolatile memory. The factory default switch setting is 999, and DHCP is enabled.

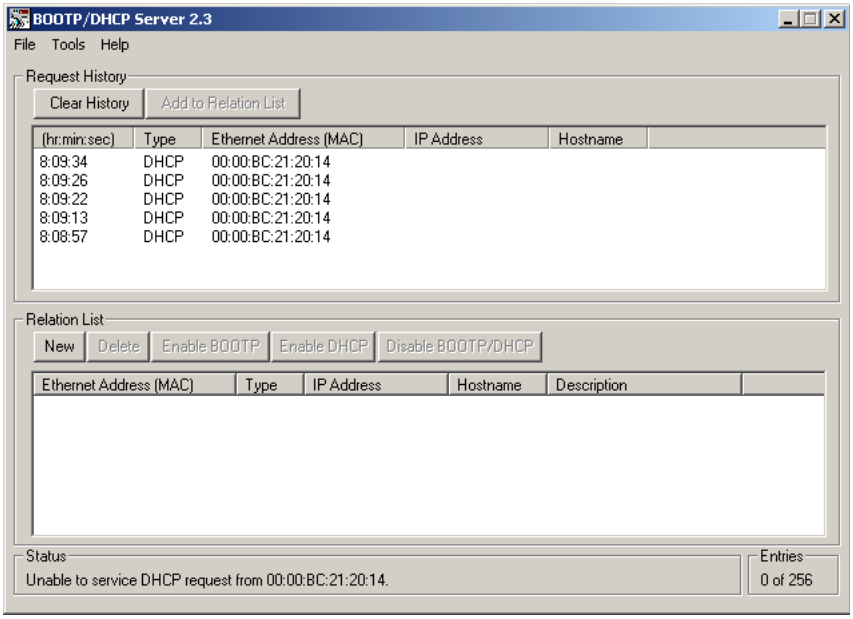
Use the Rockwell BootP/DHCP Utility

The Rockwell BootP/DHCP utility is a stand alone program that incorporates the functionality of standard BootP software with a user friendly graphical interface. It is located in the **Utils** directory on the **RSLogix 5000** installation CD. The 1734-AENT adapter must have DHCP enabled (factory default and the network address switches set to an illegal value) to use the utility.

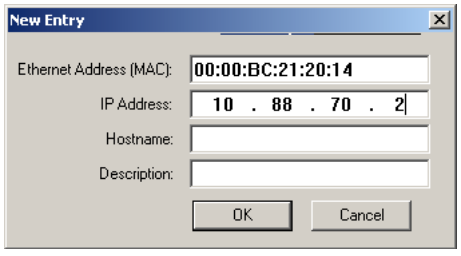
To configure your adapter using the BootP utility, perform the following steps:

1. Run the BootP software.

   In the **BOOTP Request History** panel you will see the hardware addresses of devices issuing BootP requests.

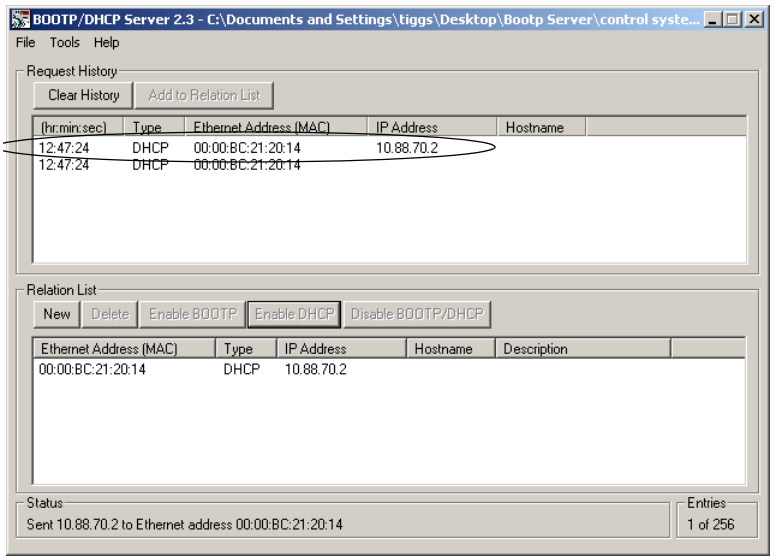


2. Double-click on the hardware address of the device you want to configure. You will see the **New Entry** pop-up window with the device's Ethernet Address (MAC).



3. Enter the **IP Address** you want to assign to the device and click on **OK**.

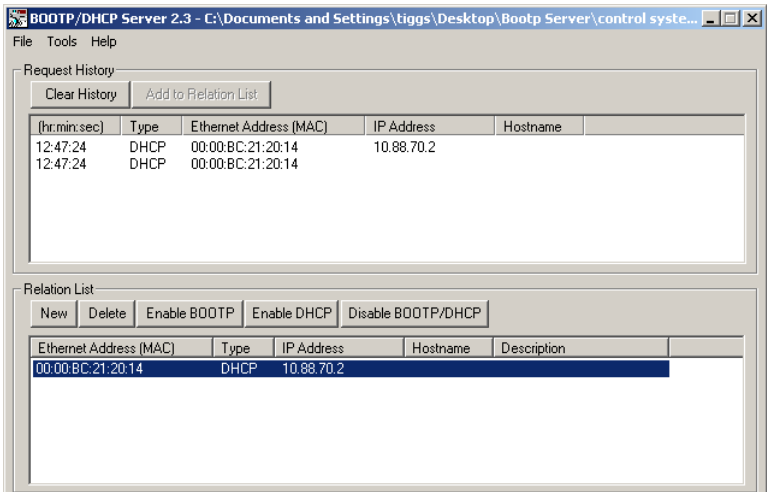
The device will be added to the **Relation List**, displaying the Ethernet Address (MAC) and corresponding IP Address, Hostname and Description (if applicable).



When the address displays in the **IP Address** column in the Request History section, it signifies that the IP address assignment has been made.

4. To assign this configuration to the device, highlight the device in the **Relation List** panel and click on the **Disable BOOTP/DHCP** button. When power is cycled to the device, it will use the configuration you assigned and not issue a DHCP request.

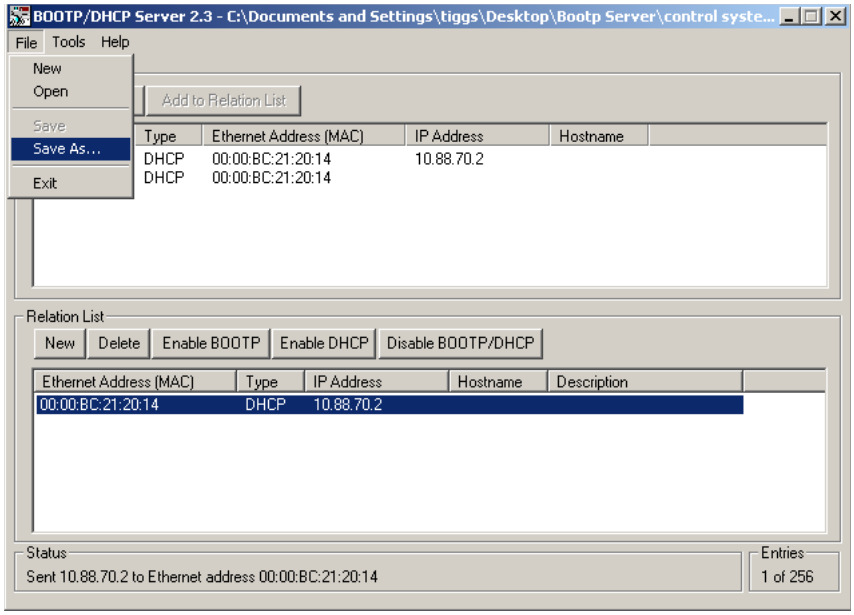
Note: To enable DHCP for a device that has had DHCP disabled, highlight the device in the Relation List and click on the **Enable DHCP** button. You must have an entry for the device in the Relation List panel to re-enable DHCP.



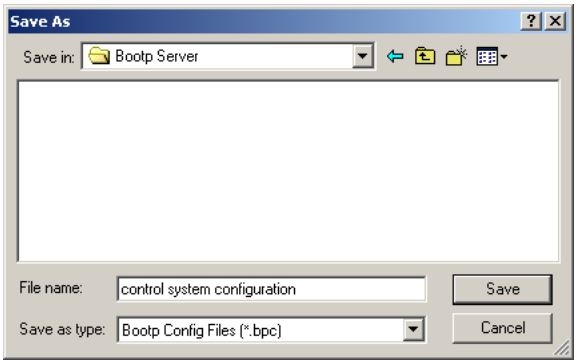
Save the Relation List

You can save the **Relation List** to use later. To save the Relation List perform the following steps:

1. Select **Save As...** from the **File** menu.



You will see the following window.

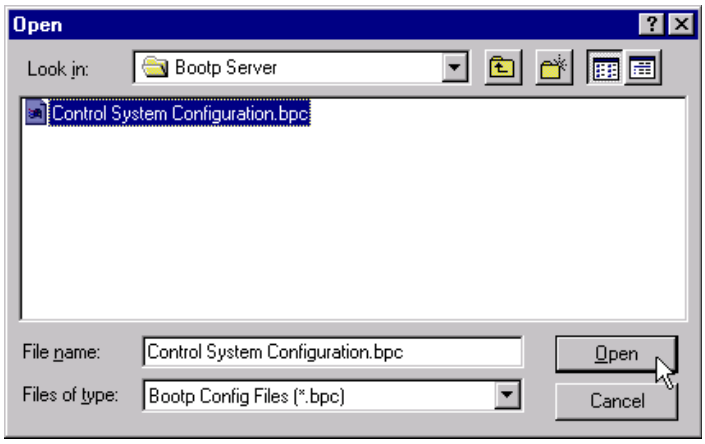


2. Select the folder you want to **Save in**:

3. Enter a **File** name for the Relation List (e.g., “control system configuration”) and click on **Save**.

   You can leave the **Save as type** at the default setting: “Bootp Config Files (*.bpc)”.

You can then open the file containing the Relation List at a later session.



Use DHCP Software to Configure Your Adapter

DHCP (Dynamic Host Configuration Protocol) software automatically assigns IP addresses to client stations logging onto a TCP/IP network. DHCP is based on BootP and maintains some backward compatibility. The main difference is that BootP was designed for manual configuration, while DHCP allows for dynamic allocation of network addresses and configurations to newly attached devices.

Be cautious about using DHCP software to configure your adapter. A DHCP server typically assigns a finite lease time to the offered IP address. When 50 percent of the leased time has expired, the 1734-AENT adapter will attempt to renew its IP address with the DHCP server. The possibility exists that the adapter will be assigned a different IP address, which would cause the adapter to cease communicating with the ControlLogix controller. Please refer to the sections **Configure the 1734-AENT with Fixed IP Address** on page 4--18 to configure the adapter with a fixed IP address.

ATTENTION

To avoid unintended control, the 1734-AENT adapter must be assigned a fixed IP address. The IP address of this adapter should not be dynamically provided. If a DHCP server is used, it must be configured to assign a fixed IP address for your adapter.

Failure to observe this precaution may result in unintended machine motion or loss of process control.

What's Next?

The following chapter describes an example application in which you configure discrete I/O using a rack optimized connection.

Configure the 1734-AENT for Direct Connection in RSLogix 5000

About the Example Application

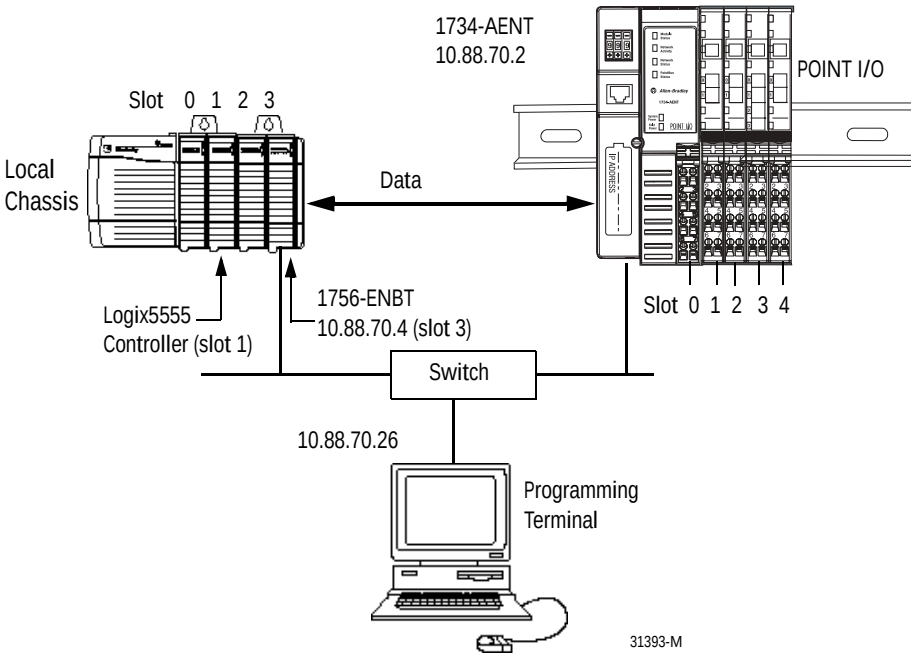
In this example, a ControlLogix processor communicates with POINT I/O via the 1734-AENT adapter using a direct connection. The adapter will make a direct connection to each of the modules referenced by the data. Note that the modules presented in this chapter are configured using RSLogix 5000, version 11.

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Set Up the Hardware

In this example, a ControlLogix chassis contains the Logix 5555 processor in slot 1 and a 1756-ENBT bridge module in slot 3. The 1734-AENT adapter is mounted on a DIN rail in slot 0, with a 1734-OW2/C relay output module in slot 1, a 1734-OV4E/C sink output module in slot 2, and a power supply (not shown).



To work along with this example set up your system as shown above.

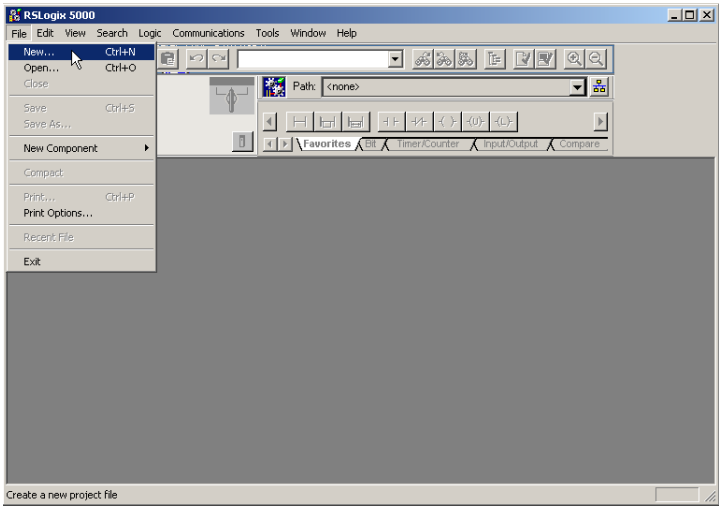
- Note that in the example application, the Logix5555 controller and 1756-ENBT module (firmware version 2.3 or higher) are assumed to be in the slots shown above.
- Verify the IP addresses for your programming terminal, 1756-ENBT module, and 1734-AENT adapter.
- Verify the position (slot) of the I/O modules on the DIN rail.
- Verify that all wiring and cabling is properly connected.
- Make sure your communication driver (e.g., AB_ETH-1 or AB-ETHIP-1) is configured in RSLinx as described in Appendix B.

Create the Example Application

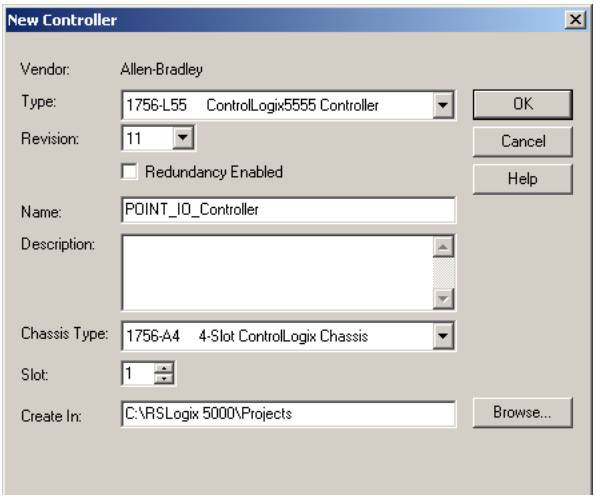
Perform the following steps to create the example application:

1. Start **RSLogix 5000 Enterprise Series**. The RSLogix 5000 Main Window will open.

2. From the **File** menu, select **New**.



   The **New Controller** pop-up window will open.



3. Enter an appropriate **Name** for the Controller, e.g., “POINT_IO_Controller.”

4. Select the correct **Version, Chassis Type** and **Slot** number of the Logix5555 controller, and the folder where you want to save the RSLogix 5000 file (**Create In**). The **Description** is optional.

   Note: Version 11 of RSLogix 5000 lets you choose to enable redundancy. This example does not use redundancy. If you are going to use redundancy in your system, check the **Redundancy Enabled** box so that a check mark appears.

5. Click on **OK**.

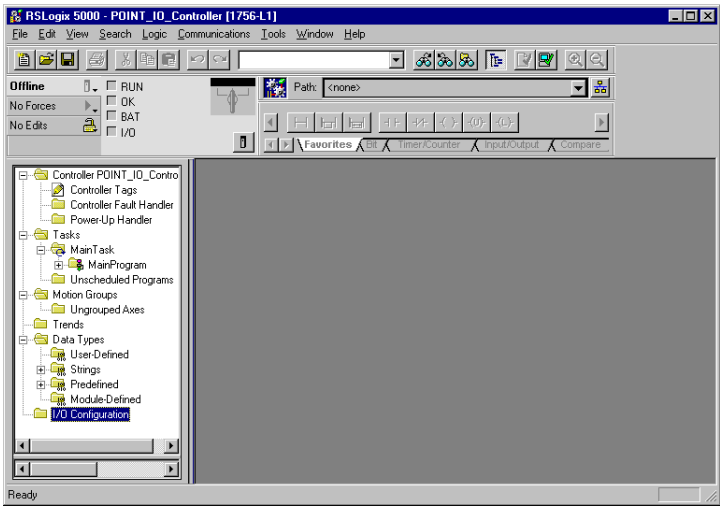
Configure the I/O

You now add the POINT I/O modules to the controller's I/O configuration. To do this you first add the local 1756-ENBT module to the I/O configuration. Next you add the 1734-AENT adapter as a "child" of the 1756-ENBT module. Then you add the I/O modules as "children" of the 1734-AENT adapter.

IMPORTANT Click on the **Help** buttons on the configuration screens shown in this section if you need assistance in selecting and setting the parameters.

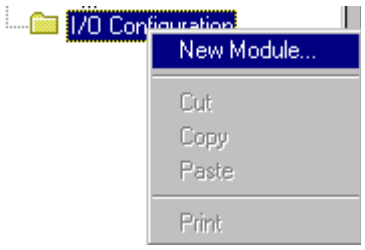
Add the Local EtherNet/IP Bridge to the I/O Configuration

1. Select the I/O Configuration folder in the project window and click the right mouse button.



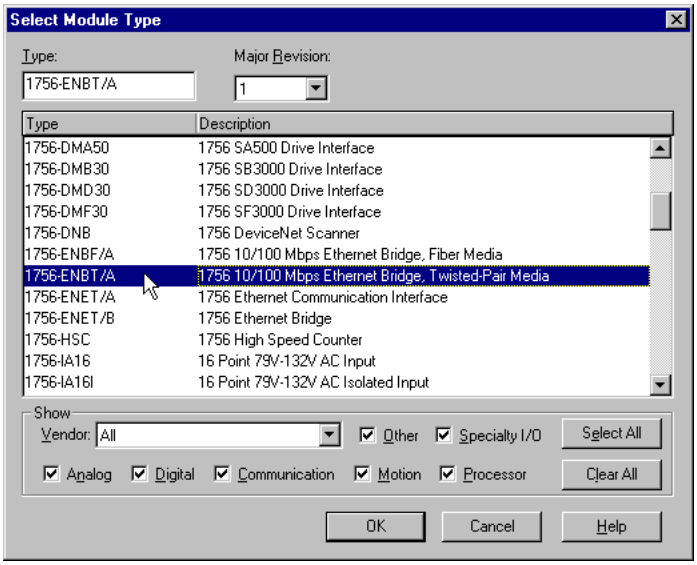
A pop-up window will open.

2. Click on **New Module**.



The **Select Module Type** window will open.

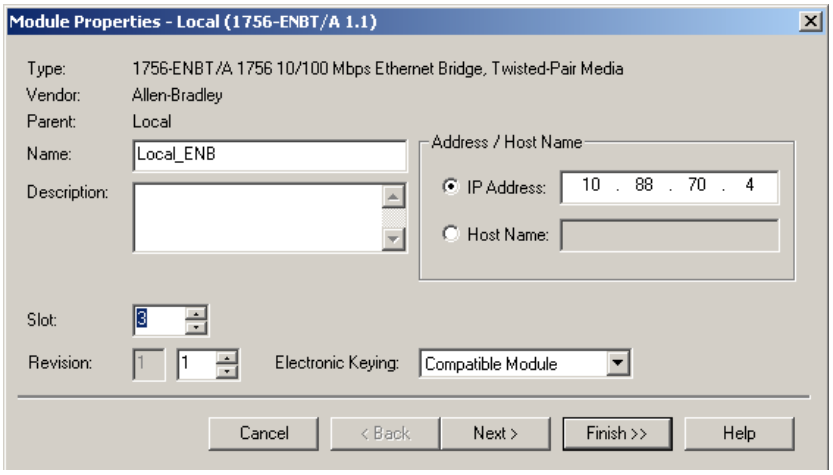
3. Select the **1756-ENBT** EtherNet/IP Bridge and click on **OK**.



The **Module Properties** window will open.

4. We used the following values:

Name	Local_ENB
IP Address	10.88.70.4
Slot	3
Electronic Keying	Compatible Module
Revision	1.1

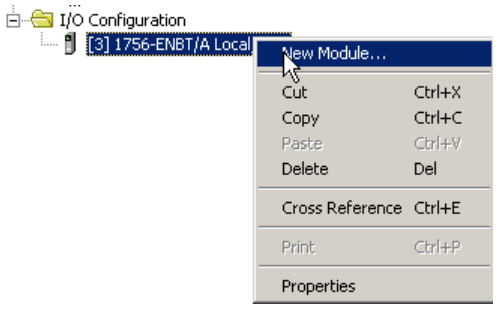


5. Click on **Finish** to accept the configuration.

Add the POINT I/O Adapter to the I/O Configuration

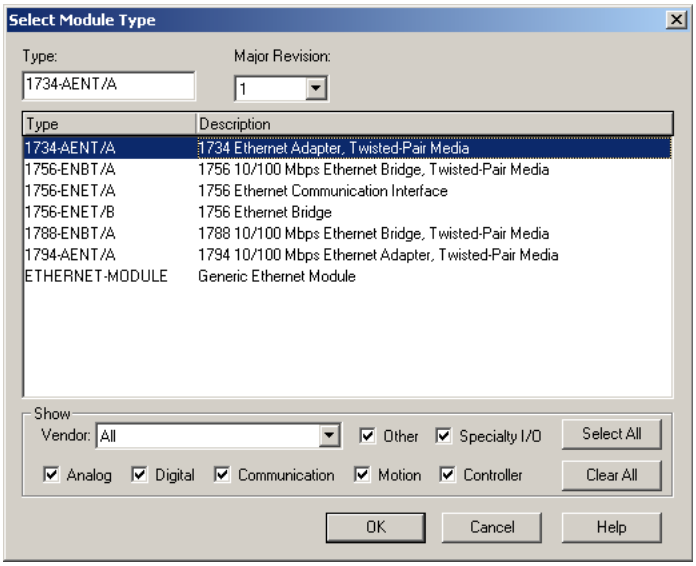
Next, you must add the 1734-AENT adapter as a “child” of the local 1756-ENBT module.

1. In the Project window, right click on the local 1756-ENBT module under the I/O Configuration folder and select **New Module** from the pop-up window.



   The **Select Module Type** window will open.

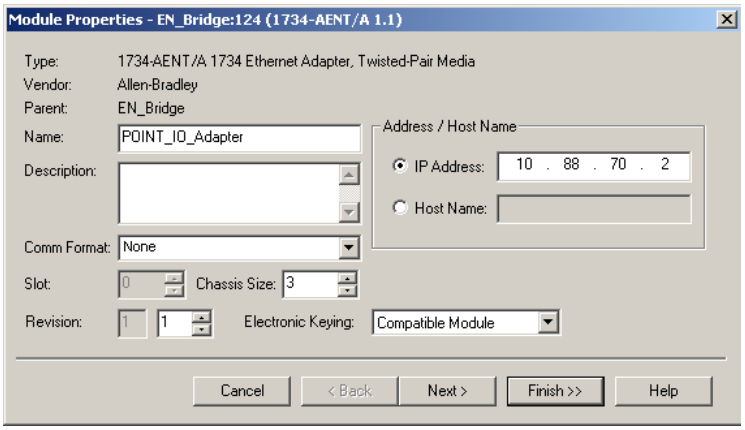
2. Select the **1734-AENT/A** Ethernet adapter from the list and click on **OK**.



The **Module Properties** window will open.

3. We used the following values:

Name	POINT_IO_Adapter
IP Address	10.88.70.2
Comm Format	None
Chassis Size	3
Electronic Keying	Compatible Module
Revision	1.1
Note that the **Slot** field is disabled because the slot is automatically 0 for the 1734-AENT.	



IMPORTANT The chassis size equals 1 for the adapter + the number of POINT I/O modules installed (physically present on the POINT I/O backplane).

Comm Format choices:

- none = the adapter will make a direct connection to each of the modules referenced by the data.
- rack optimization = digital I/O data is collected into a rack image. (**Note:** This does not include analog or specialty I/O modules.)
- listen only - rack optimization = read or verify data only, but does not control the modules (when you have multiple processors - one processor is used to control and the other processors are used to monitor).

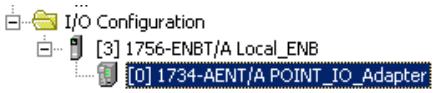
Because we are making a direct connection, **None** is chosen as the **Comm Format**.

4. Click **Next**.

Because None was entered as the **Comm Format** on the **Module Properties** window, the RPI (requested packet interval) is disabled.

5. Click on the **Finish** button to accept the configuration.

The 1734-AENT adapter will appear indented under the local 1734-ENBT in the I/O Configuration folder.



Add the POINT I/O Modules to the I/O Configuration

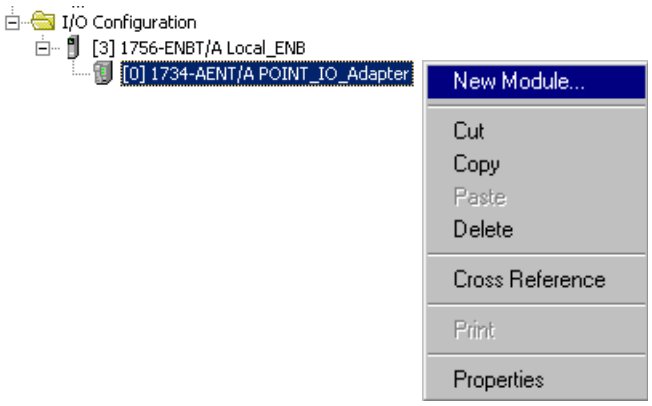
You must now add the POINT I/O modules to the I/O Configuration List under the 1734-AENT adapter.

In this example, you will add a 1734-OW2 relay output and a 1734-OV4E sink output module with standard configurations. Use these steps as a guide when you are configuring different I/O modules for your system.

TIP This example application uses the I/O modules' default configurations. For more information, see the POINT I/O Selection Guide, publication no. 1734-SG001.

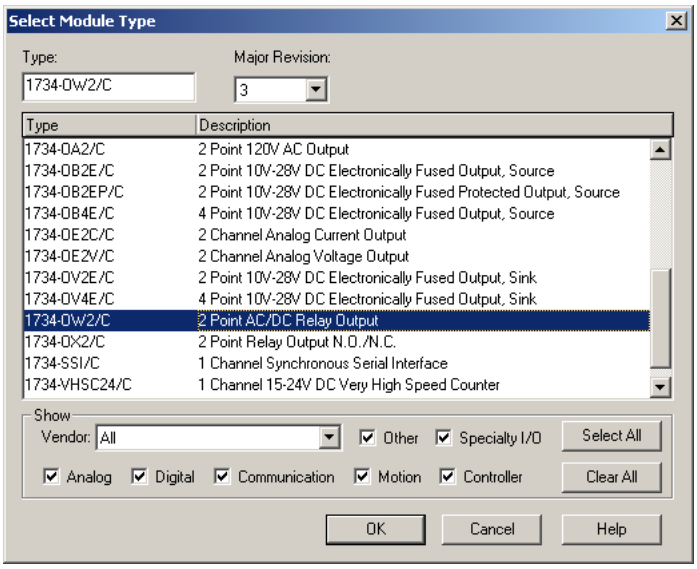
Add the Relay Output Module

1. Right click on the remote **1734-AENT** adapter under the I/O Configuration folder and select **New Module**.



The **Select Module Type** window will open.

2. Select the **1734-OW2/C** relay output module from the list and click on **OK**.

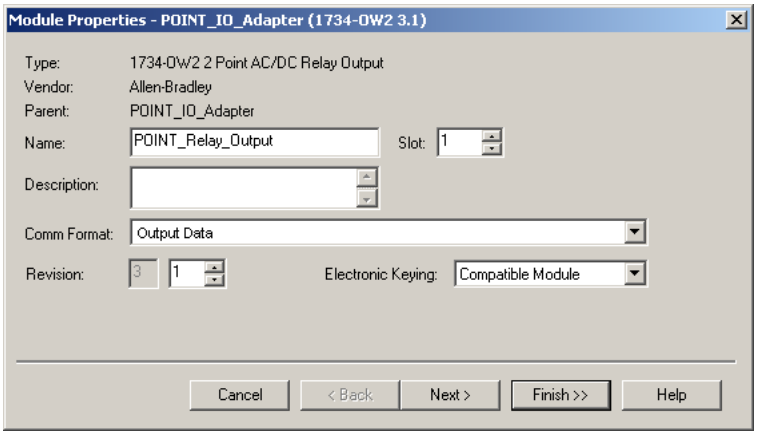


TIP At the bottom of the **Select Module Type** screen, you can choose **Clear All** and then select a type of module (analog, digital, specialty) to narrow your search.

The **Module Properties** window will open.

3. We used the following values:

Name	POINT_Relay_Output
Slot	1
Comm Format	Output Data
Electronic Keying	Compatible Module
Revision	3.1



The **Comm Format** is **Output Data**, indicating a direct connection, because on the adapter's property window, we set the **Comm Format** to **None**.

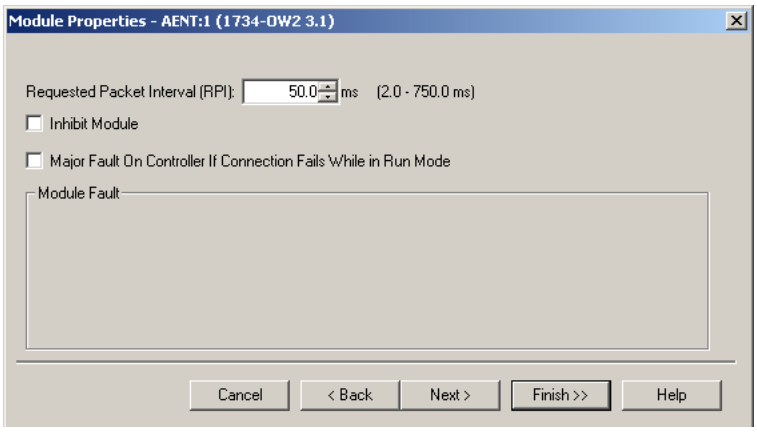
If you are using a discrete input module, then the **Comm Format** would be **Input Data**.

4. Choose **Next**.

   Notice that RPI is selectable on the screen below since it is a direct connection.

5. Enter the RPI (requested packet interval) to set how often the data is exchanged with the 1734-AENT.

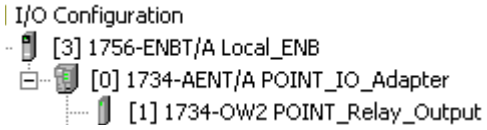
IMPORTANT To avoid overloading the 1734-AENT, it is recommended that the RPI be no less than 10 ms for rack connections and 50 ms for direct connections.



6. Enter **50** for the RPI.

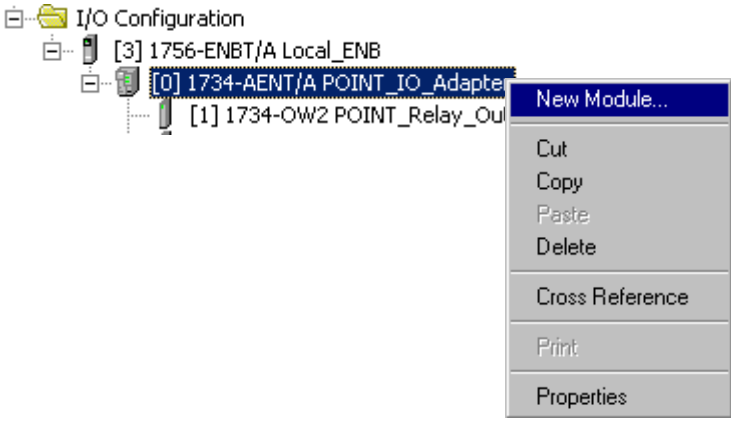
7. Click on the **Finish** button to save the configuration.

The relay output module will appear in the I/O configuration indented under the 1734-AENT adapter.



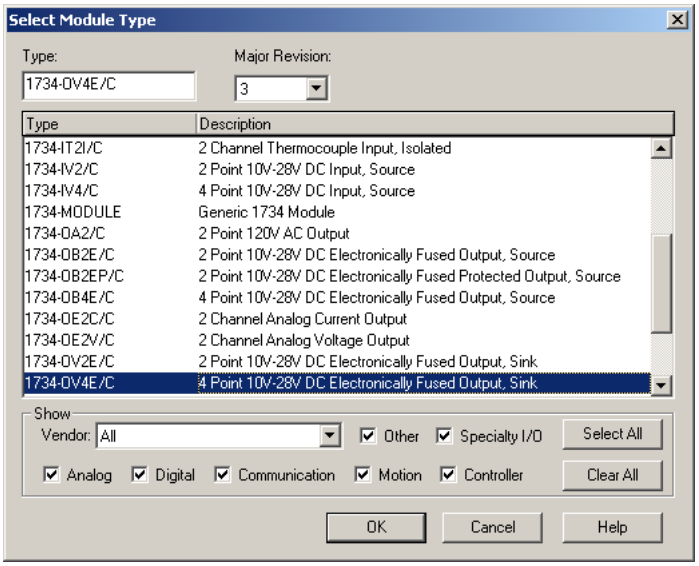
Add the Digital Output Module

8. Right click on the **1734-AENT** adapter and again select **New Module**.



The **Select Module Type** window will open.

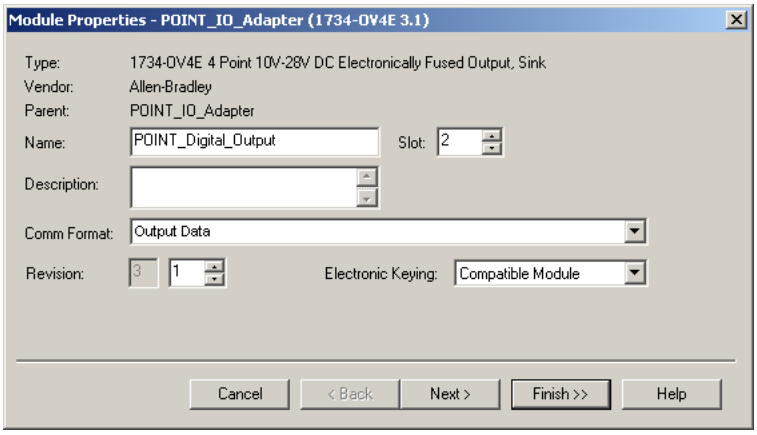
9. Select the **1734-OV4E/C** digital output module from the list.



The **Module Properties** window will open.

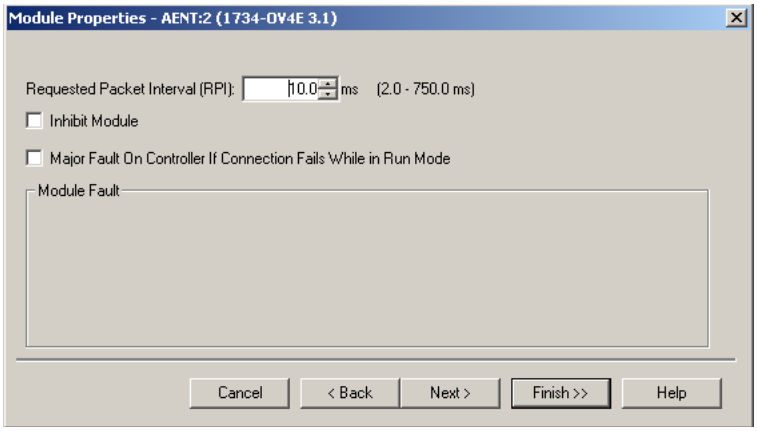
10. We used the following values:

Name	POINT_Digital_Output
Slot	2
Comm Format	Output Data
Electronic Keying	Compatible Module
Revision	3.1

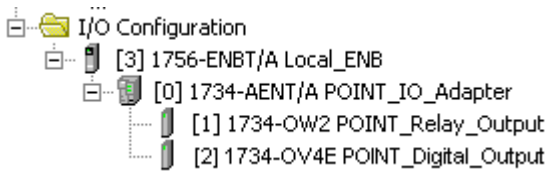


11. Click the **Next** button.

12. Leave 10 ms. as the RPI for the 1734-OV4E module.



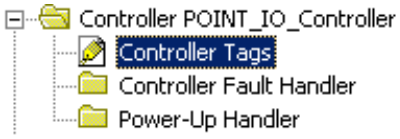
13. Click on the **Finish** button to accept the configuration. The I/O Configuration in the Project window should look similar to the one shown below.



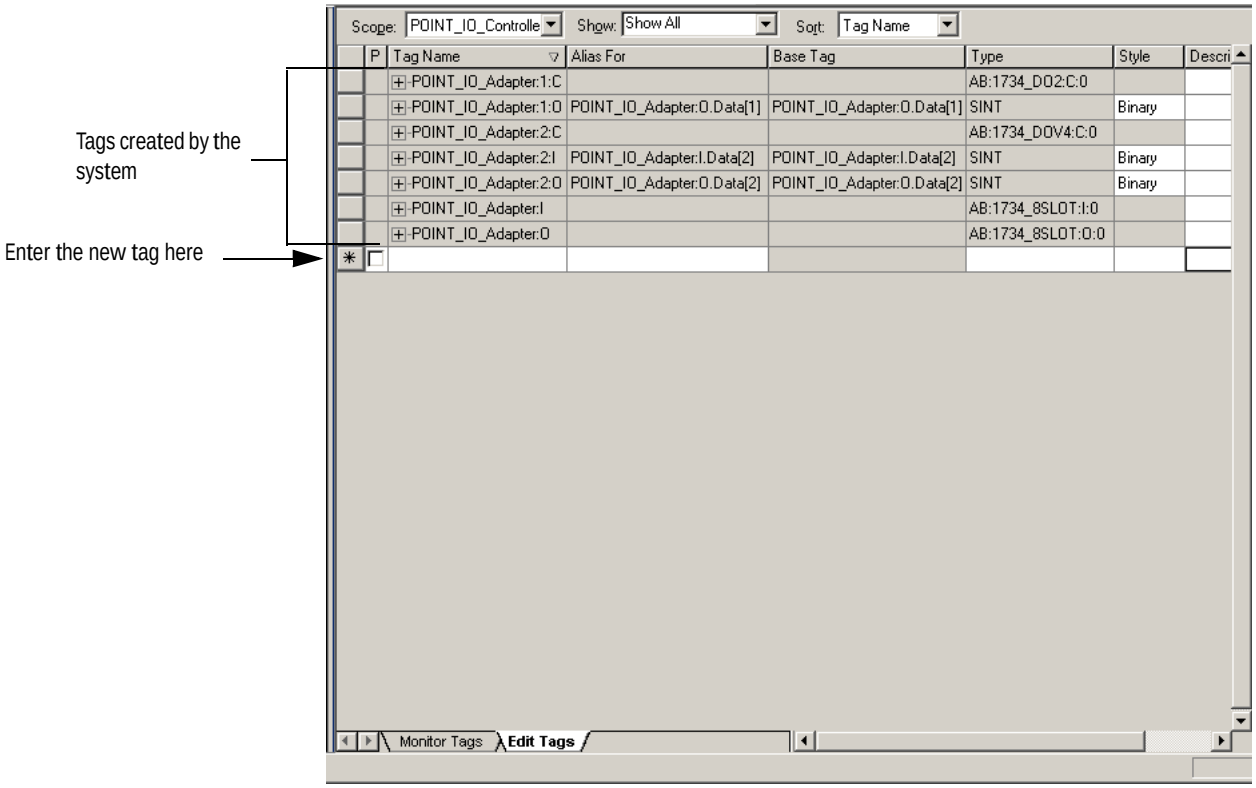
Edit the Controller Tags

When you add modules to the I/O configuration the system creates tags for those modules to use in the application program. For the example application you need to add one more Controller Tag.

1. Double-click on the **Controller Tags** folder in the project window.

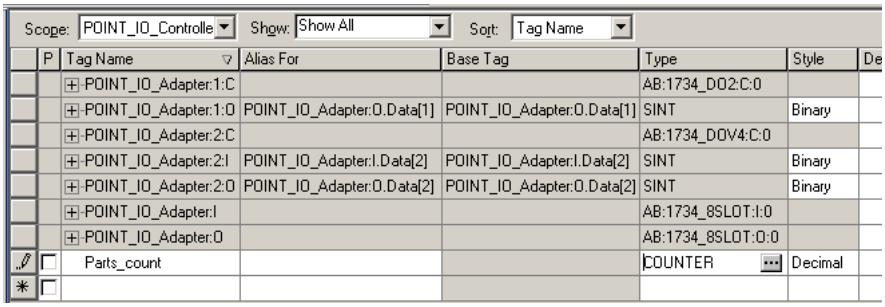


The **Controller Tags** window will open. You will see the tags created for the 1734-AENT and digital I/O modules.



2. Click on the **Edit Tags** tab at the bottom of the Controller Tags window and create the following tag:

Tag	Type
Parts_Count	Counter

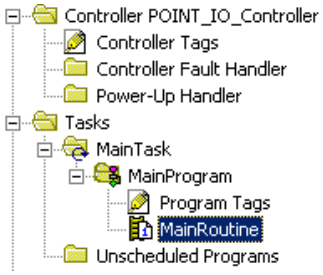


3. Close the **Controller Tags** window.

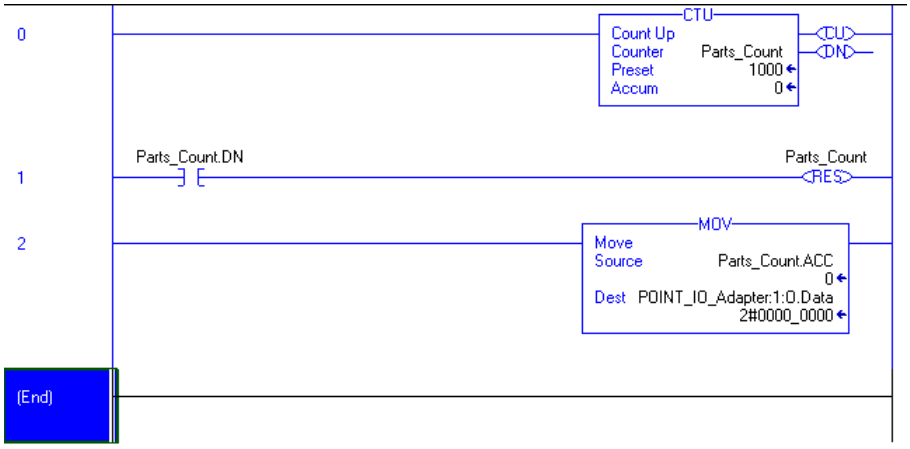
Create the Ladder Program

Next create the example ladder program to test the I/O.

1. Double-click on **Main Routine** under the **Main Program** folder.



2. Enter the following ladder program using the tags previously created.

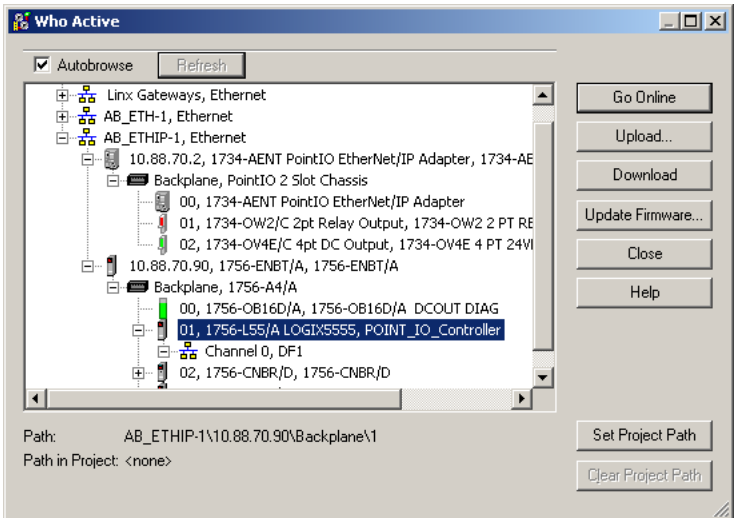


3. **Save** the program.

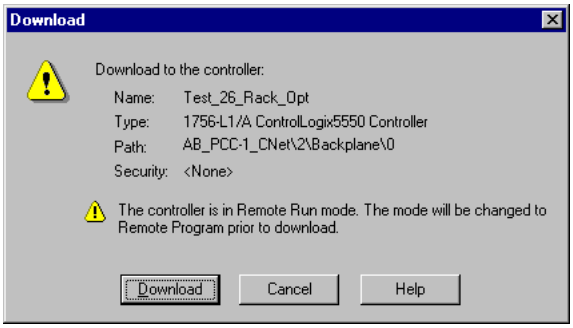
Download the Program to the Controller

Follow this procedure to download the program we just saved to the ControlLogix controller.

1. From the main menu, choose **Communications>Who-Active**.
2. Navigate to select the slot where the processor is located in the chassis.
3. Choose **Set Project Path**.
4. Choose **Download**.

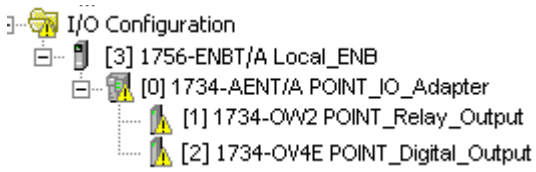


5. Choose **Download**.



You see this window.

Notice that the 1756-ENBT Bridge is now online. If yellow triangles are present, see the following section.

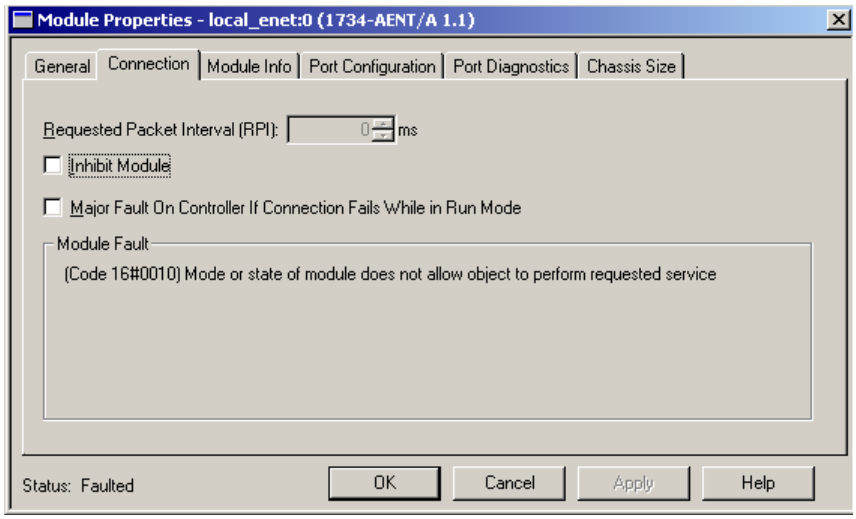


Verify the Module Chassis Size

You have now built the I/O tree in RSLogix 5000, and the RSLogix 5000 software used the chassis size from the 1734-AENT **General** tab. Now you need to download this new chassis size value into the 1734-AENT adapter hardware. This procedure will synchronize the chassis size value from the RSLogix 5000 software into the 1734-AENT hardware.

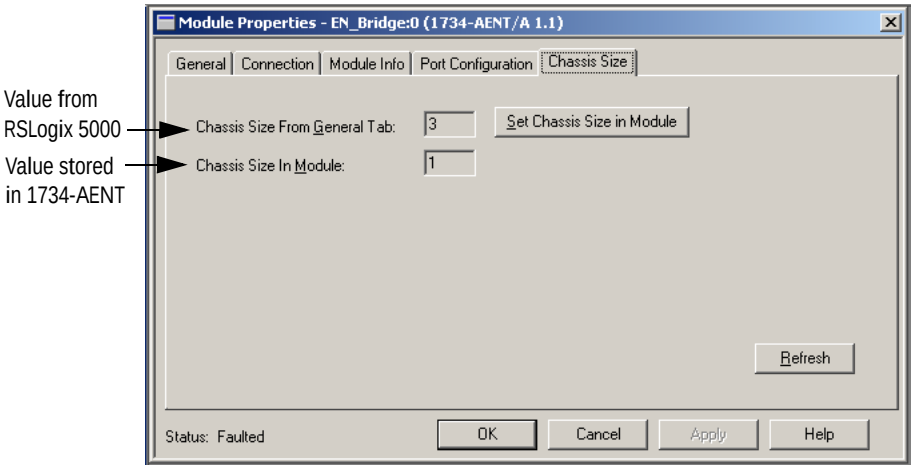
1. Verify that RSLogix 5000 is online.
2. Right click on the 1734-AENT under I/O Configuration in the Project window.
3. Select **Properties**.
4. Click the **Connection** tab.

   You see the Module Fault error code.

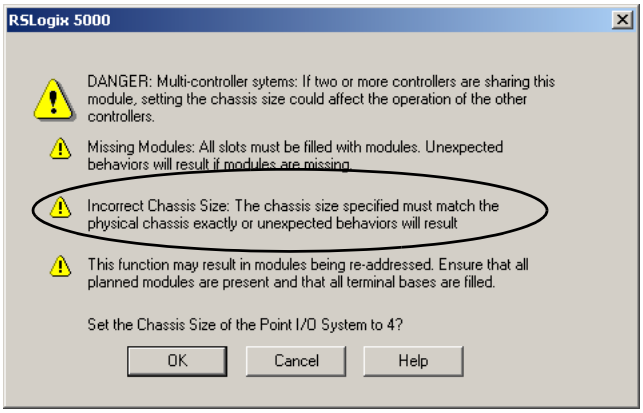


5. Click the **Chassis Size** tab.

6. Click **Set Chassis Size in Module**.

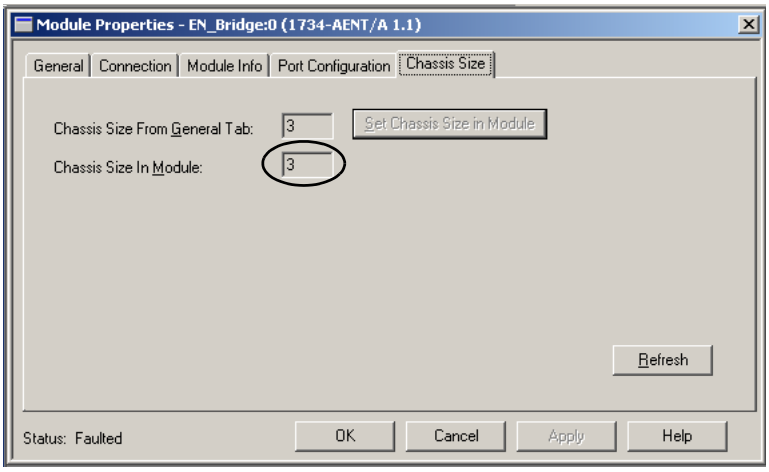


7. Read and acknowledge the warning screen.



8. Click **OK** to continue.

Notice the chassis size in the module has been modified to 3.



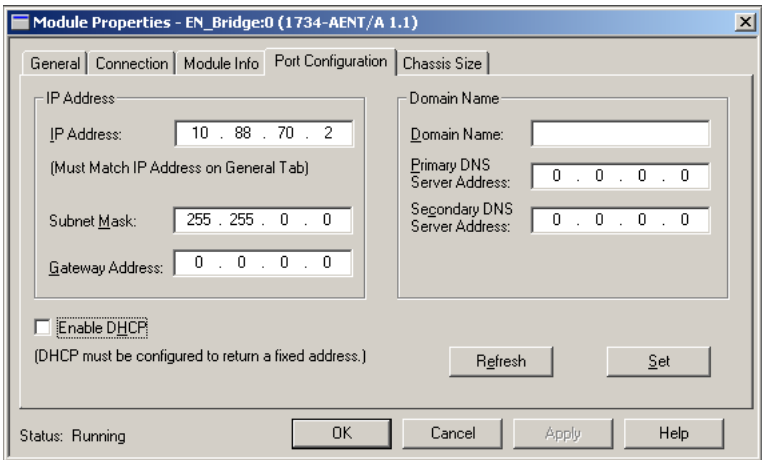
9. Click **OK**.

   At this point, your PointBus status LED should be solid green. All the yellow triangles in your I/O configuration should be gone.

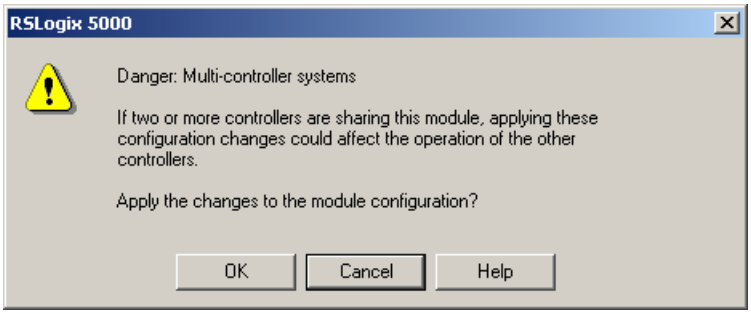
Configure the 1734-AENT with Fixed IP Address

To configure the 1734-AENT with a fixed IP address to prevent the adapter from ceasing to communicate with the ControlLogix controller:

1. Click on the **Port Configuration** tab in the 1734-AENT properties window.
2. Click the **Enable DHCP** box so that there is **not** a check mark in the box.



3. Click the **Set** button.
4. Read and acknowledge the warning.

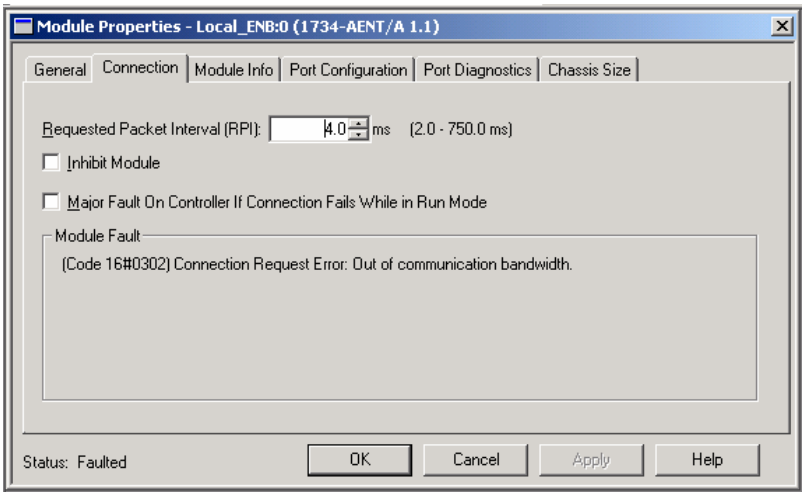


5. Click **OK**.
6. Click the **Refresh** button to verify the changes.

An Overloaded 1734-AENT

Each POINT I/O connection established with the 1734-AENT will consume a portion of the microprocessor's bandwidth. The amount of bandwidth used by a connection depends on a number of variables, including the Requested Packet Interval (RPI), the number of POINT I/O modules involved in the connection, and the rate of change of the I/O. The 1734-AENT continuously monitors this bandwidth and will reject requests for new connections when there is insufficient bandwidth available to support the new connection.

The condition where the 1734-AENT cannot support the connection due to a limit of the microprocessor's bandwidth is shown below.



If this condition is encountered, the only action that can be taken is to alter the existing connections to reduce the amount of microprocessor bandwidth consumed. The most likely fixes for this condition include:

- Increase the RPI
- Decrease the number of connections.

Notes:

Configure the 1734-AENT for Direct Connection and Rack Optimization in RSLogix 5000

What's in This Chapter

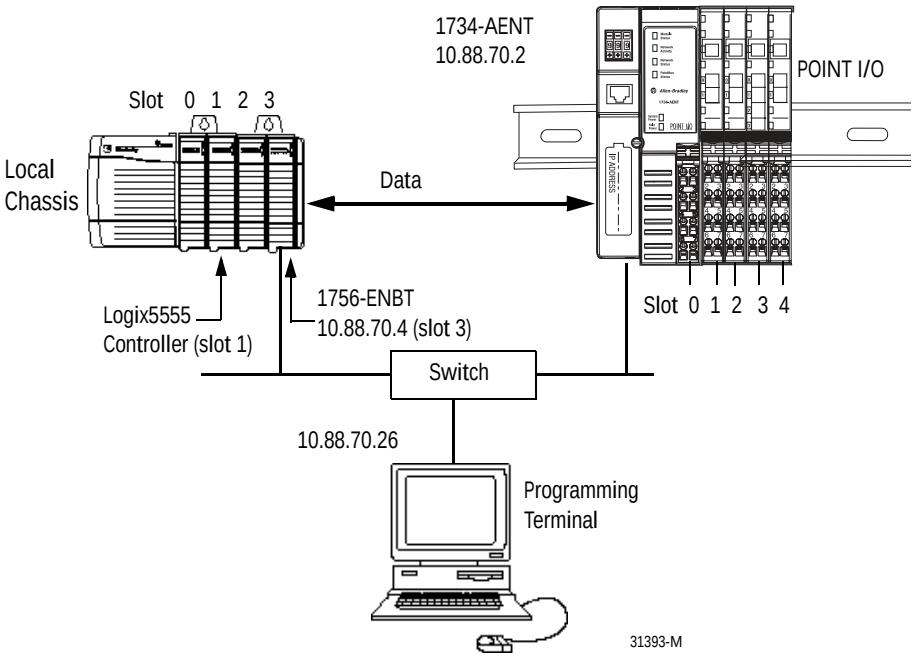
This chapter guides you through the steps required to configure your 1734 POINT I/O Ethernet Adapter for both direct connection and rack optimization using RSLogix 5000. You can mix communication formats for different I/O modules communicating through the same adapter. I/O modules set up to use rack optimization will communicate at the rate of the RPI configured for the 1734-AENT adapter. I/O modules configured for direct communication will communicate at their own set RPIs and ignore the 1734-AENT adapter's RPI. Note that the modules presented in this chapter are configured using RSLogix 5000, version 11. The chapter contains the following main sections:

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Set Up the Hardware

In this example, a ControlLogix chassis contains the Logix 5555 processor in slot 1 and a 1756-ENBT bridge module in slot 3. The 1734-AENT adapter is mounted on a DIN rail in slot 0, with a 1734-OW2/C relay output module in slot 1, a 1734-OV4E/C sink output module in slot 2, and a power supply (not shown).



To work along with this example set up your system as shown above.

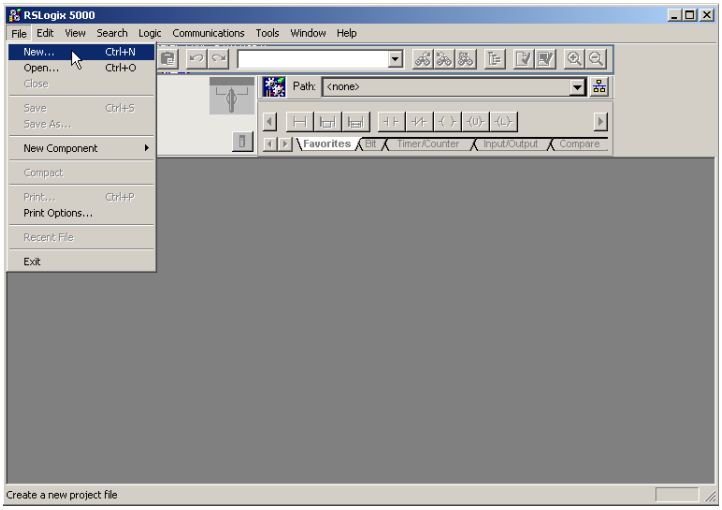
- Note that in the example application, the Logix5555 controller and 1756-ENBT module (firmware version 2.3 or higher) are assumed to be in the slots shown above.
- Verify the IP addresses for your programming terminal, 1756-ENBT module, and 1734-AENT adapter.
- Verify the position (slot) of the I/O modules on the DIN rail.
- Verify that all wiring and cabling is properly connected.
- Make sure your communication driver (e.g., AB_ETH-1 or AB-ETHIP-1) is configured in RSLinx as described in Appendix B.

Create the Example Application

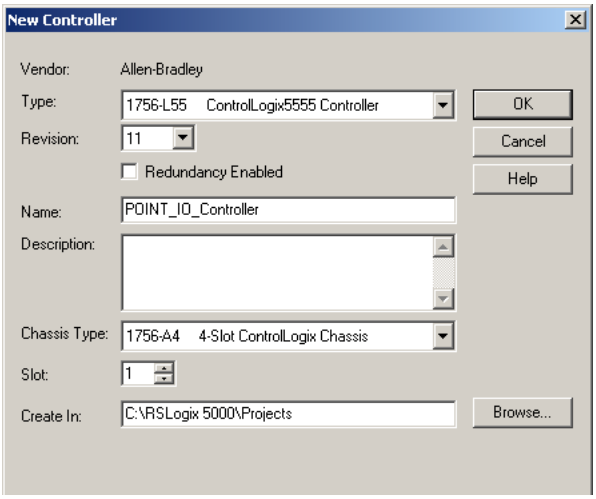
Perform the following steps to create the example application:

1. Start **RSLogix 5000 Enterprise Series**. The RSLogix 5000 Main Window will open.

2. From the **File** menu, select **New**.



The New Controller pop-up window will open.



3. Enter an appropriate **Name** for the Controller, e.g., “POINT_IO_Controller.”

4. Select the correct **Version**, **Chassis Type** and **Slot** number of the Logix5555 controller, and the folder where you want to save the RSLogix 5000 file (**Create In**). The **Description** is optional.

   Note: Version 11 of RSLogix 5000 lets you choose to enable redundancy. This example does not use redundancy. If you are going to use redundancy in your system, check the **Redundancy Enabled** box so that a check mark appears.

Click on **OK.**

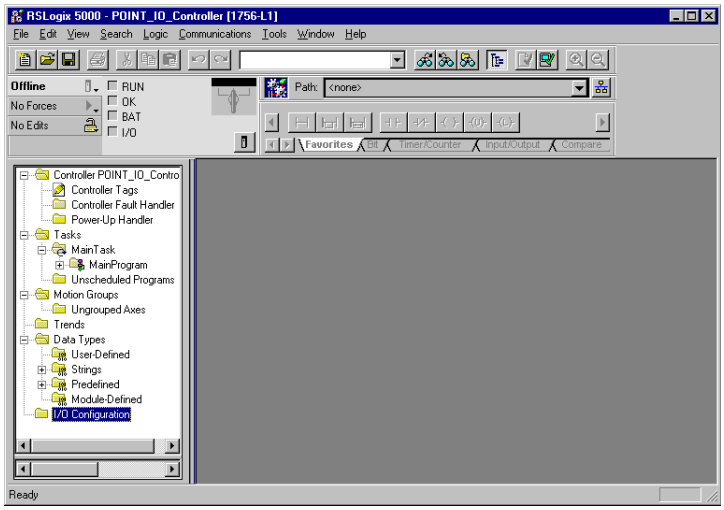
Configure the I/O

You now add the POINT I/O modules to the controller's I/O configuration. To do this you first add the local 1756-ENBT module to the I/O configuration. Next you add the 1734-AENT adapter as a "child" of the 1756-ENBT module. Then you add the I/O modules as "children" of the 1734-AENT adapter.

IMPORTANT Click on the **Help** buttons on the configuration screens shown in this section if you need assistance in selecting and setting the parameters.

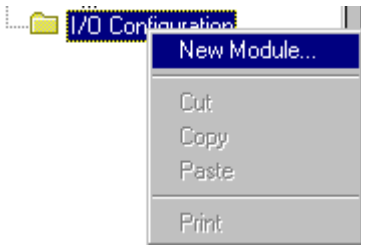
Add the Local EtherNet/IP Bridge to the I/O Configuration

1. Select the I/O Configuration folder in the project window and click the right mouse button.



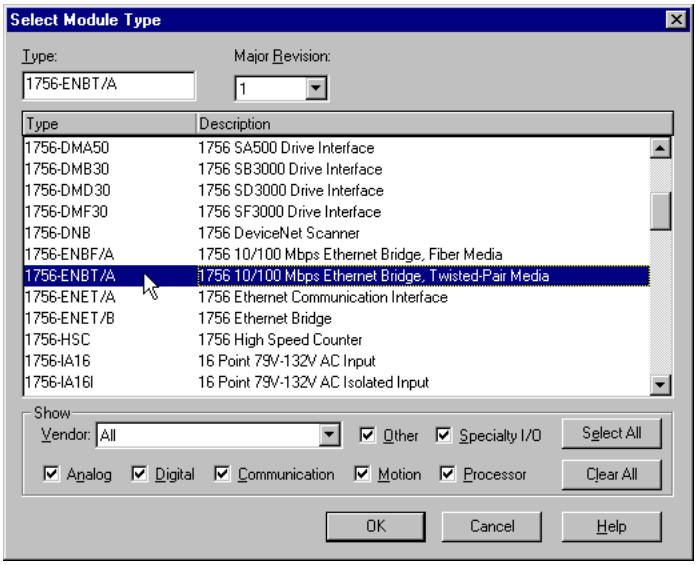
A pop-up window will open.

2. Click on **New Module**.



The **Select Module Type** window will open.

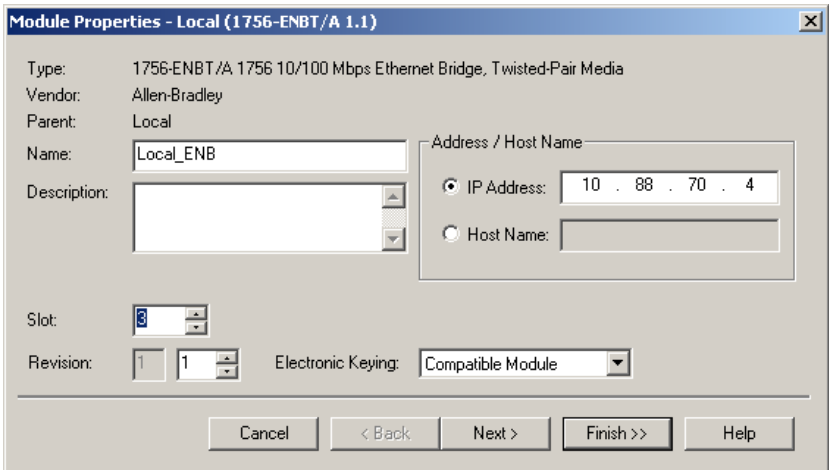
3. Select the **1756-ENBT** EtherNet/IP Bridge and click on **OK**.



The **Module Properties** window will open.

4. We used the following values:

Name	Local_ENB
IP Address	10.88.70.4
Slot	3
Electronic Keying	Compatible Module
Revision	1.1

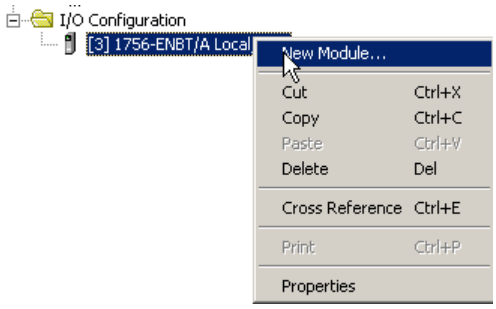


5. Click on **Finish** to accept the configuration.

Add the POINT I/O Adapter to the I/O Configuration

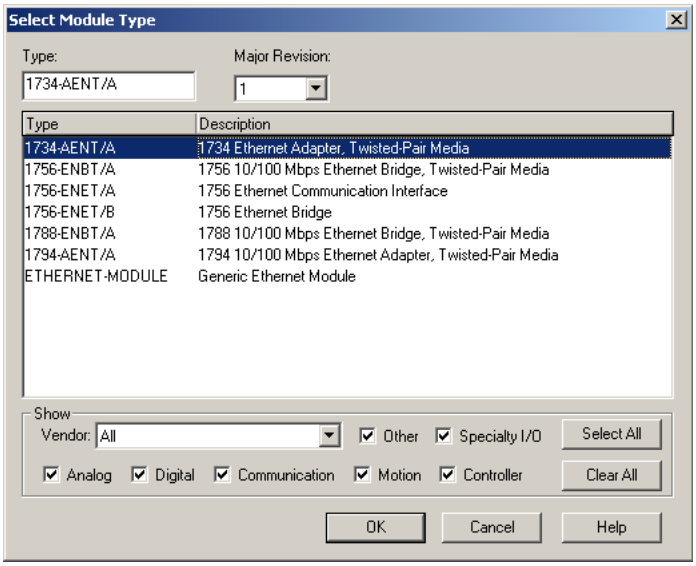
Next, you must add the 1734-AENT adapter as a “child” of the local 1756-ENBT module.

1. In the Project window, right click on the local 1756-ENBT module under the I/O Configuration folder and select **New Module** from the pop-up window.



   The **Select Module Type** window will open.

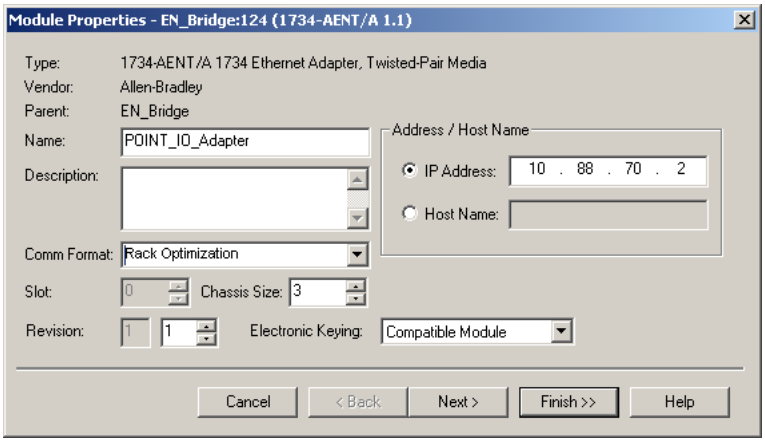
2. Select the **1734-AENT/A** Ethernet adapter from the list and click on **OK**.



The **Module Properties** window will open.

3. We used the following values:

Name	POINT_IO_Adapter
IP Address	10.88.70.2
Comm Format	Rack Optimization
Chassis Size	3
Electronic Keying	Compatible Module
Revision	1.1
Note that the **Slot** field is disabled because the slot is automatically 0 for the 1734-AENT.	



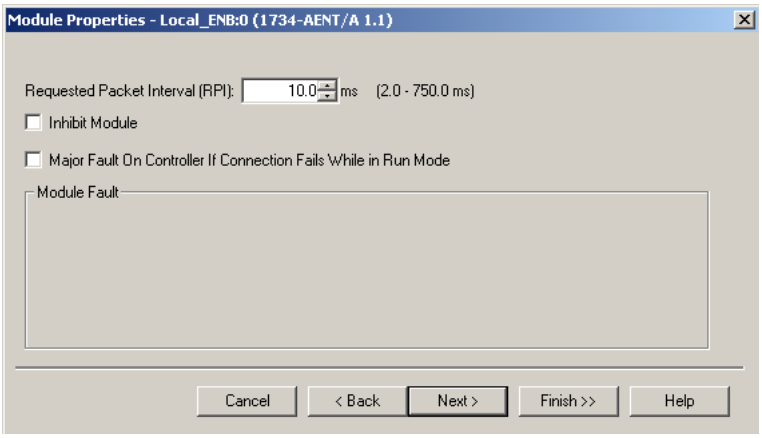
IMPORTANT The chassis size equals 1 for the adapter + the number of POINT I/O modules installed (physically present on the POINT I/O backplane).

- Comm Format choices:
  - none = the adapter will make a direct connection to each of the modules referenced by the data
  - rack optimization = digital I/O data is collected into a rack image. (**Note:** This does not include analog or specialty I/O modules.)
  - listen only - rack optimization = read or verify data only, but does not control the modules (when you have multiple processors - one processor is used to control and the other processors are used to monitor).

Because we are making a mixed connection (both a direct connection and rack optimized connection), **Rack Optimization** is chosen as the **Comm Format**.

4. Click on **Next**.

The following window will open:

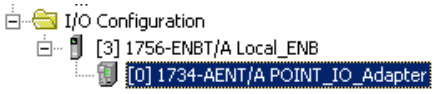


5. Verify that the **Requested Packet Interval** (RPI) is appropriate for your system (10 ms for this example). This will be used for the rack optimized connection to the I/O modules.

IMPORTANT To avoid overloading the 1734-AENT, it is recommended that the RPI be no less than 10 ms for rack connections and 50 ms for direct connections.

6. Click on the **Finish** button to accept the configuration.

The 1734-AENT adapter will appear indented under the local 1734-ENBT in the I/O Configuration folder.

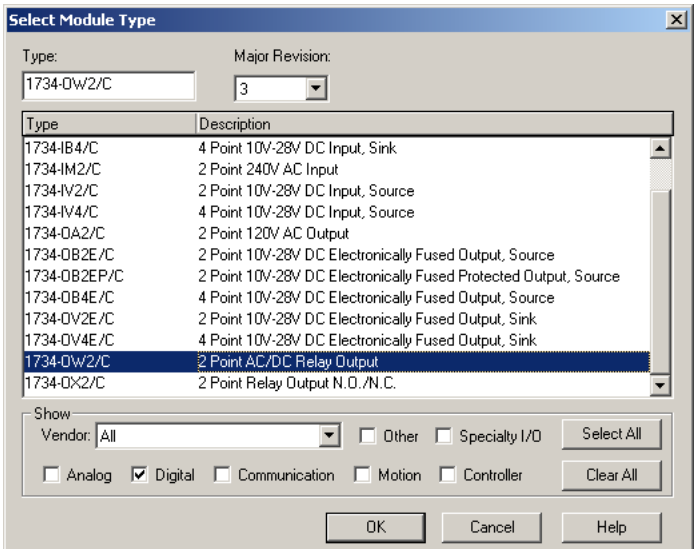


Add the POINT I/O Module and Configure For Direct Connection

1. Highlight the 1734-AENT under I/O configuration, right click and select **New Module**.

IMPORTANT If the 1734-AENT chassis size is exceeded, (i.e., you try to add more modules than you configured) the **New Module** selection will be dimmed out and disabled. You will not be able to add any more POINT I/O modules until the 1734-AENT chassis size is increased.

2. Choose the 1734-OW2/C from the list of modules.

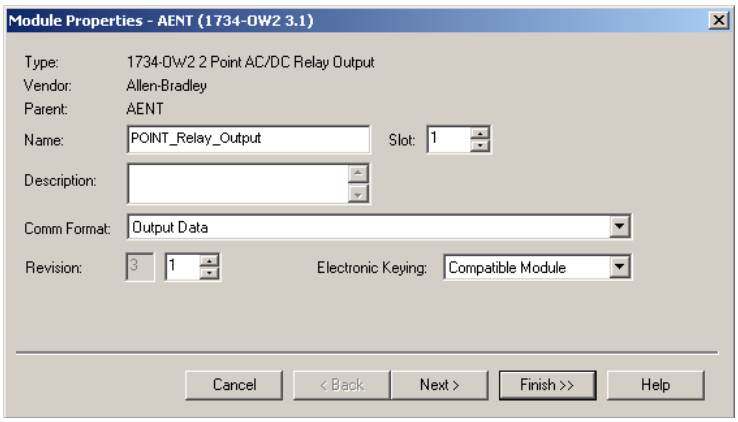


TIP At the bottom of the **Select Module Type** screen, you can choose **Clear All** and then select a type of module (analog, digital, specialty) to narrow your search.

3. Click **OK**.

   The **Module Properties** window will open.

4. Enter a **Name** (optional), **Slot Number**, and the **Comm Format**.



   The **Comm Format** is **Output Data** because we are configuring a mixed direct connection and rack optimized connection, with the 1734-OW2/C Relay Output module configured for a direct connection.

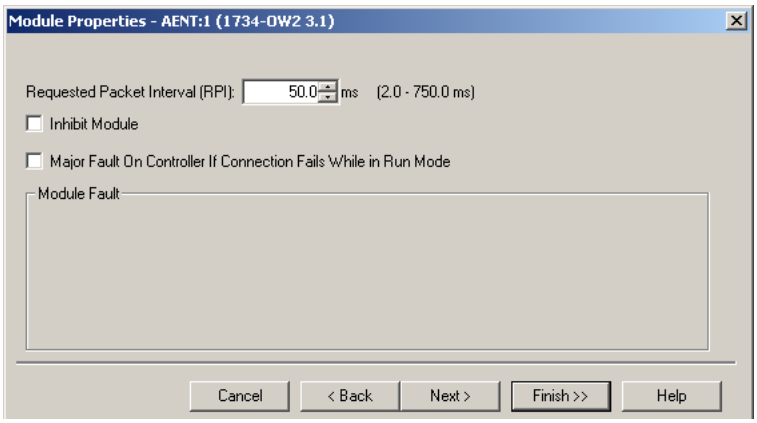
   If you are using a discrete input module, then the **Comm Format** would be **Input Data** for a direct connection.

5. Choose **Next.**

Notice that RPI is selectable on the screen below since it is a direct connection.

6. Enter the RPI (requested packet interval) to set how often the data is exchanged with the 1734-AENT.

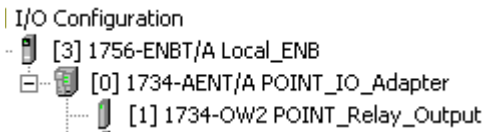
IMPORTANT To avoid overloading the 1734-AENT, it is recommended that the RPI be no less than 10 ms for rack connections and 50 ms for direct connections.



7. Enter **50** for the RPI.

8. Choose **Finish**.

Notice that the 1734-OW2 is now under the I/O configuration.

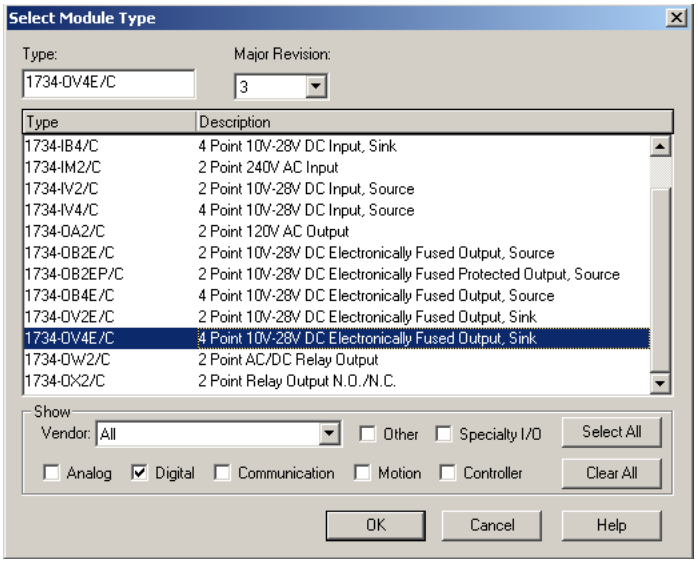


Add the POINT I/O Module and Configure For Rack Optimization

1. Highlight the 1734-AENT under I/O Configuration, right click and select **New Module**.

   The **Select Module Type** window will open.

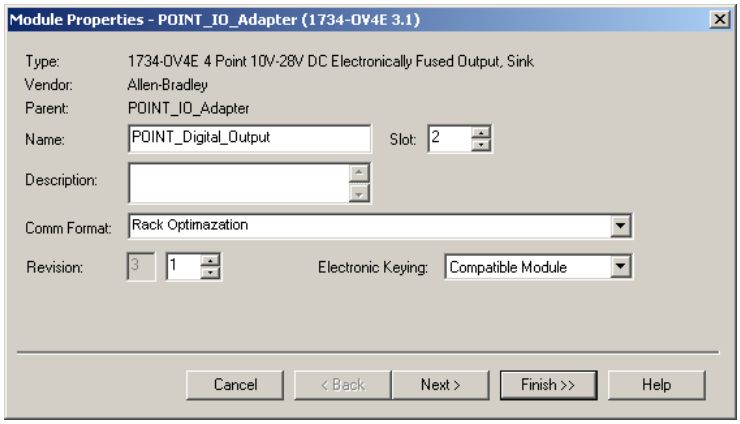
2. Choose the 1734-OV4E/C module.



3. Click **OK**.

   The **Module Properties** window will open.

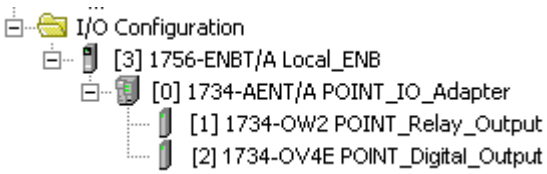
4. Enter a **Name**, **Slot**, **Comm Format**, and **Comm Format**.



   The **Comm Format** is **Rack Optimization** because we are configuring a mixed direct connection and rack optimized connection, with the 1734-OVE4/C digital output module configured for a rack optimized connection.

The output data for the 1734-OW2 is a separate and distinct module on the network. The 1734-OV4E is part of the rack connection.

5. Click on the **Finish** button to accept the configuration. The I/O Configuration in the Project window should look similar to the one shown below.



6. Choose **Finish**.

7. Choose **File>Save** and enter the name and location of the RSLogix 5000 file.

Download the Program to the Controller

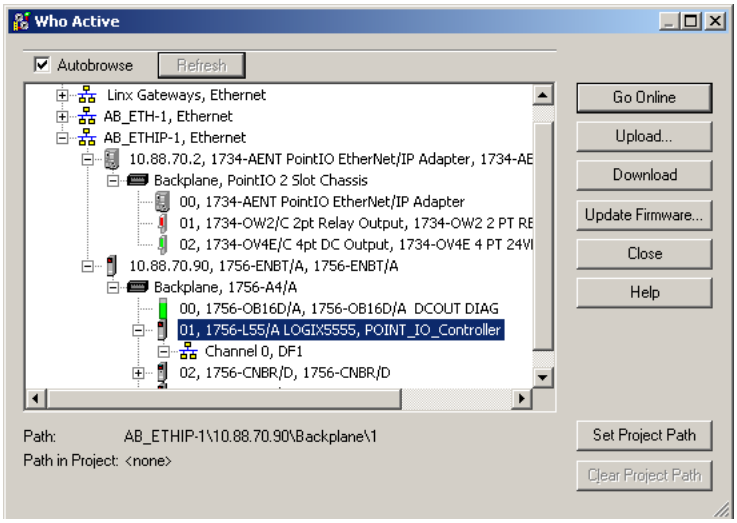
Follow this procedure to download the program we just saved to the ControlLogix controller.

1. From the main menu, choose **Communications>Who-Active**.

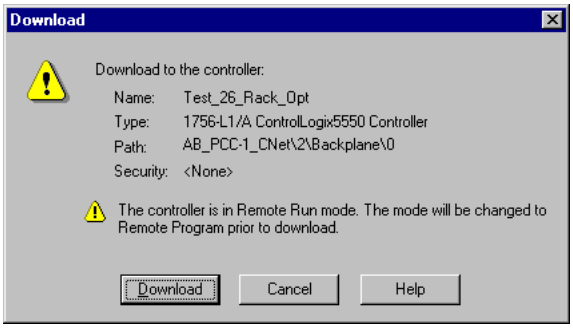
2. Navigate to select the slot where the processor is located in the chassis.

3. Choose **Set Project Path**.

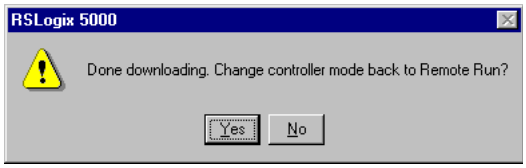
4. Choose **Download**.



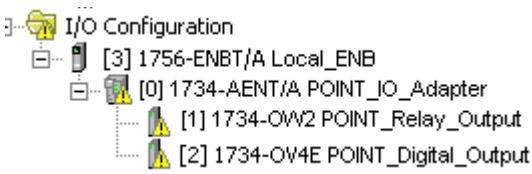
5. Choose **Download**.



You see this window.



Notice that the 1756-ENBT Bridge is now online. If yellow triangles are present, see the following section.

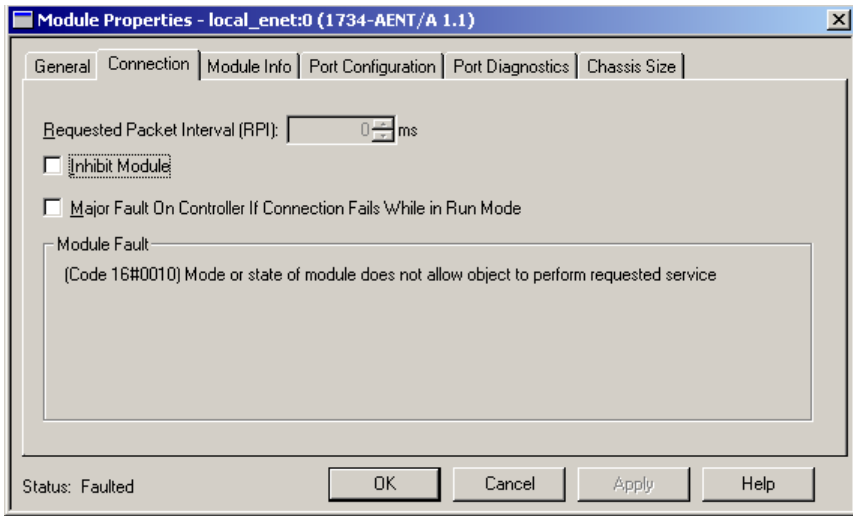


Verify the Module Chassis Size

You have now built the I/O tree in RSLogix 5000, and the RSLogix 5000 software used the chassis size from the 1734-AENT **General** tab. Now you need to download this new chassis size value into the 1734-AENT adapter hardware. This procedure will synchronize the chassis size value from the RSLogix 5000 software into the 1734-AENT hardware. You must be online to perform this procedure.

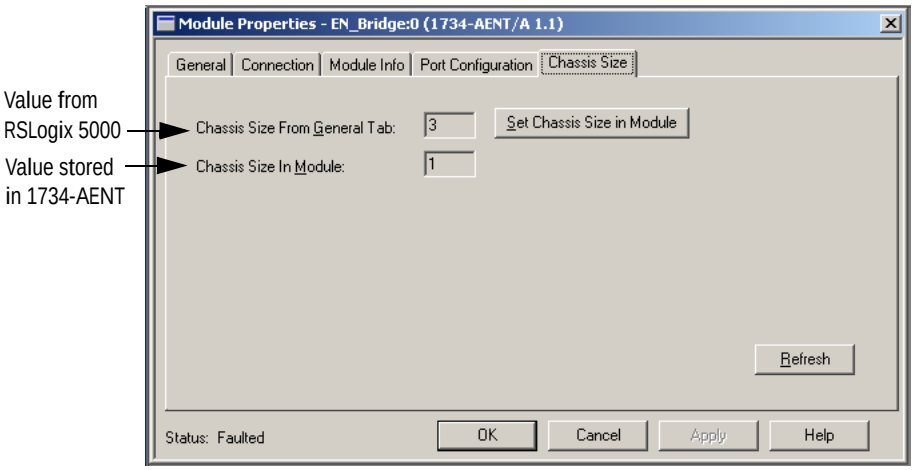
1. Verify that RSLogix 5000 is online.
2. Right click on the 1734-AENT under I/O Configuration in the Project window.
3. Select **Properties**.
4. Click the **Connection** tab.

You see the Module Fault error code.

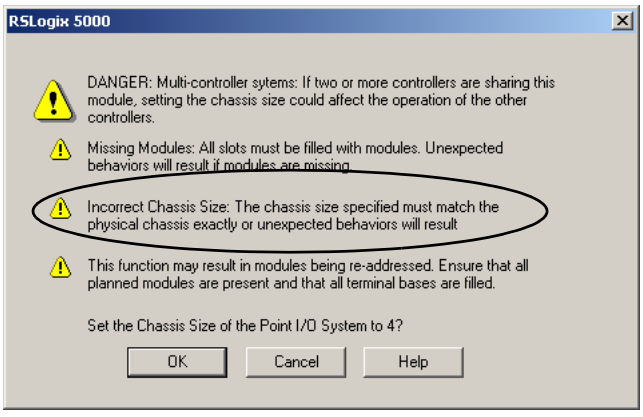


5. Click the **Chassis Size** tab.

6. Click **Set Chassis Size in Module**.

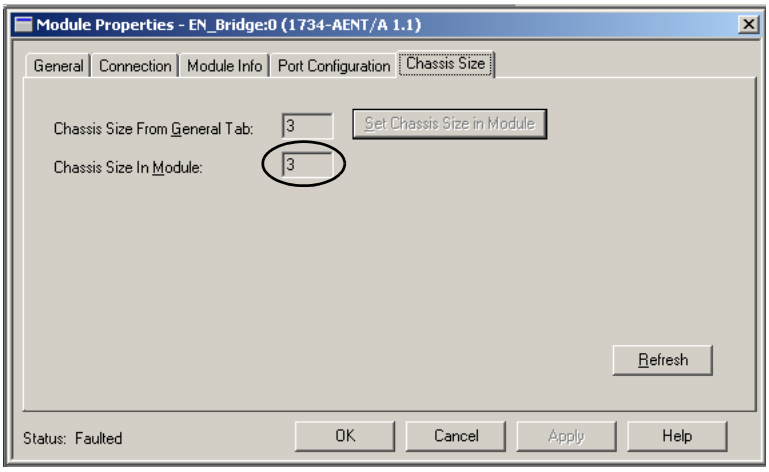


7. Read and acknowledge the warning screen.



8. Click **OK** to continue.

   Notice the chassis size in the module has been modified to 3.



9. Click **OK**.

   At this point, you PointBus status LED should be solid green. All the yellow triangles in your I/O configuration should be gone.

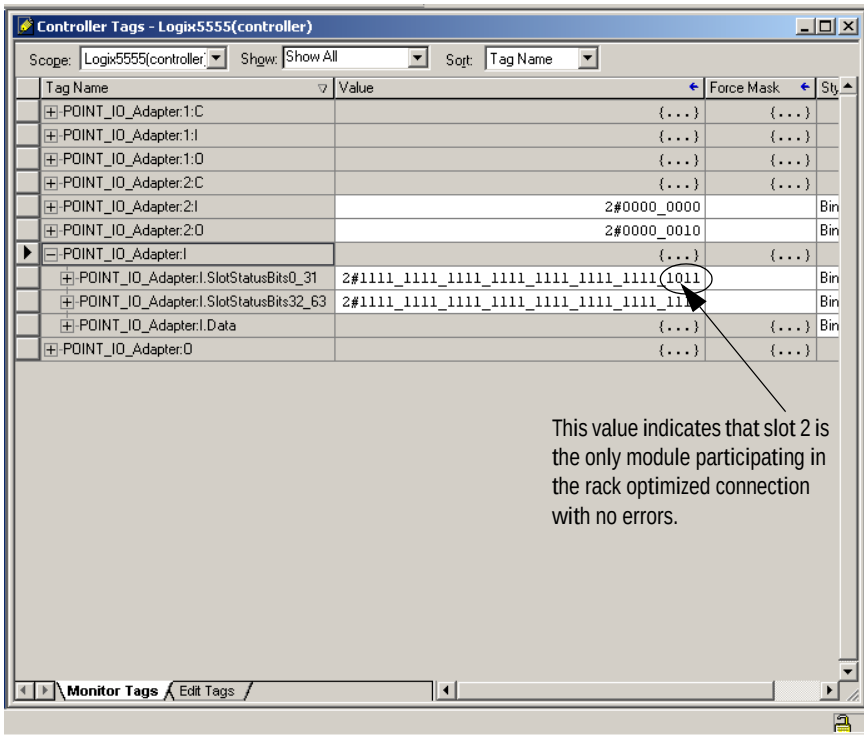
10. Click **OK** to close the window.

11. Click **File>Save** to save the project.

Access Module Data via the 1734-AENT Adapter

Use the following information to use the 1734 POINT I/O Ethernet adapter module data in the ladder logic program.

- POINT_IO_Adapter = the name you gave to your Ethernet adapter
- # = slot number of POINT I/O module
- C = configuration, I = input, O = output



Use the controller tags in your ladder program to read input data or write output data.

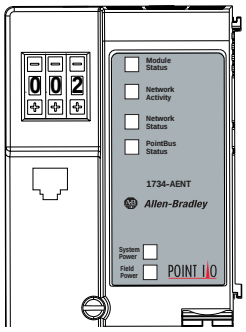
- For RSLogix 5000 programming instructions, refer to RSLogix 5000 Getting Results, publication no. 9399-RLD300GR.
- For ControlLogix controller information, refer to ControlLogix System User Manual, publication no. 1756-UM001.
- Slot Status Bits: The Slot Status bits display the connection status for each of the POINT I/O modules that use a rack optimized connection. Bit 0 is reserved for the adapter and always reports a value of 1. Each of the other bits (1-63) correspond to a POINT I/O module that may be installed in the POINT I/O backplane. Note that in this example, the 1734-AENT is configured for both rack optimized and direct connections. The slot status bits indicate that the module in slot 2 is installed and operating correctly (0=module participating with no errors and 1=module not participating or connection error (typically, module removed/missing)).

LED Status Indicators

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Interpret the Status Indicators



Indication	Probable Cause
System Power	
Off	Not active; field power is off or dc-dc converter problem
Green	System power on; dc-dc converter active (5V dc)
Field Power	
Off	Not active; field power is off
Green	Power on; 24V dc present

Indication	Probable Cause
Module Status	
Off	No power applied to device
Flashing Red/Green	LED powerup test (module self-test)
Green	Device is operating normally
Flashing Red	Recoverable fault has occurred: Firmware (NVS) update

Indication	Probable Cause
Solid Red	Unrecoverable fault has occurred: • Self-test failure (checksum failure, or ramtest failure at powerup) • Firmware fatal error
Network Status	
Off	Device not initialized. The module does not have an IP address
Flashing Green	No CIP connections. Device has an IP address, but no CIP connections are established
Green	CIP connections. Device on-line and has an IP address, and CIP connections are established
Flashing Red	One or more Ethernet connections has timed-out
Solid Red	No link. The module is not physically connected to a powered Ethernet Device
Flashing Red/Green	The module is performing a self-test (only occurs during powerup test)
Network Activity	
Off	No link established
Flashing Green/Off	Transmit or receive activity
Steady Green	Link established
PointBus Status	
Off	Device not powered - check module status indicator
Flashing Red/Green	LED powerup test
Flashing Red	Recoverable fault has occurred: • at powerup the number of expected modules does not equal the number of modules present • a module is missing • node fault (I/O connection timeout)
Red	Unrecoverable fault has occurred: • the adapter is bus off • the adapter has failed its duplicate MAC ID check
Flashing Green	Adapter online with no PointBus connections established. Adapter chassis size has not been configured
Green	Adapter online with PointBus connections established (normal operation, run mode)

Safety Approvals and Specifications

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Safety Approvals

Safety Approval information for the 1734-AENT is below.

The following information applies when operating this equipment in hazardous locations:		**Informations sur l'utilisation de cet équipement en environnements dangereux:**	
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.		Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.	
WARNING 	**EXPLOSION HAZARD -** Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. Substitution of components may impair suitability for Class I, Division 2. If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**AVERTISSEMENT** 	**RISQUE D'EXPLOSION –** Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2. S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Specifications

Specifications information for the 1734-AENT is below.

Specifications - 1734-AENT EtherNet/IP Adapter	
Expansion I/O Capacity	Maximum of 63 modules Maximum of 5 Rack Optimized connections (for digital modules only) Maximum of 25 direct connections 1734-AENT backplane current output = 1.0A. The actual number of modules can vary. Add up the current requirements of the modules you want to use to make sure they do not exceed the amperage limit of 1.0A for the 1734-AENT. Backplane current can be extended beyond 1.0A by using 1734-EP24DC backplane extension Power Supplies. Add multiple 1734-EP24DC modules to reach the 63 module maximum). **Cat. No. — PointBus Current Requirements** 1734-IB2 — 75mA 1734-IB4 — 75mA 1734-IV2 — 75mA 1734-IV4 — 75mA 1734-OB2E — 75mA 1734-OB2EP — 75mA 1734-OB4E — 75mA 1734-OV2E — 75mA 1734-OV4E — 75mA 1734-OW2 — 80mA 1734-OX2 — 100mA 1734-IE2C — 75mA 1734-OE2C — 75mA 1734-IE2V — 75mA 1734-OE2V — 75mA 1734-IA2 — 75mA 1734-IM2 — 75mA 1734-OA2 — 75mA 1734-IJ2 — 160mA 1734-IK2 — 160mA 1734-IR2 — 220mA 1734-IT2I — 175mA 1734-SSI — 110mA 1734-VHSC5 — 180mA 1734-VHSC24 — 180mA 1734-232ASC — 75mA 1734-485ASC — 75mA
Ethernet Communication Rate	10/100Mbits/s, half or full-duplex
Module Location	Starter module - left side of the 1734 system
Power Supply Specifications	
Input Voltage Rating	24V dc nominal 10-28.8V dc range
Field Side Power Requirements	24V dc (+20% = 28.8V dc maximum) @ 400mA maximum
Inrush Current	6A maximum for 10ms
Interruption	Output voltage will stay within specifications when input drops out for 10ms at 10V with maximum load

General Specifications	
Indicators	3 red/green status indicators Adapter status PointBus status Network status 3 green status indicators: Network activity status System Power (PointBus 5V power) Field Power (24V from field supply)
Power Consumption	4.5W maximum @ 28.8V dc
Power Dissipation	15.5W maximum @ 28.8V
PointBus Output Current	1A maximum @ 5V dc ±5% (4.75 - 5.25)
Input Overvoltage Protection	Reverse polarity protected
Thermal Dissipation	9.5 BTU/hr maximum @ 28.8V dc
Isolation Voltage	Tested to withstand 1250V rms for 60s
Field Power Bus Nominal Voltage Supply Voltage Range Supply Current	 24V dc 10-28.8V dc range, 10A maximum
Dimensions Inches (Millimeters)	3.0H x 2.16W x 5.25L (76.2H x 54.9W x 133.4L)
Environmental Conditions	
Operational Temperature	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20 to 55°C (-4 to 131°F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40 to 85°C (-40 to 185°F)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5 to 95% noncondensing
Shock Operating Nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock) 30g peak acceleration 50g peak acceleration
Vibration	IEC 60068-2-6 (Test Fc, Operating) Tested 5g @ 10-500Hz
ESD Immunity	IEC 61000-4-2: 4kV contact discharges 8kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 2000MHz 10V/m with 200Hz 50% pulse 100%AM from 900MHz
EFT/B Immunity	IEC 61000-4-4: ±4kV at 2.5kHz on power ports ±2kV at 5.0kHz on signal ports

Surge Transient Immunity	IEC 61000-4-5: ±1kV line-line(DM) and ±2kV line-earth(CM) on signal ports ±1kV line-line(DM) and ±2kV line-earth(CM) on power ports
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80MHz
Emissions	CISPR 11: Group 1, Class A
Enclosure Type Rating	None (open-style)
Conductors Wire Size Category	14- 22 AWG (2.5-0.25mm^2) solid or stranded wire rated at 75^{o}C or higher 3/64 inch (1.2mm) insulation maximum 2[1]
Ethernet Connector	RJ-45, Category 5
Terminal Base Screw Torque	7 pound-inches (0.8Nm)
Mass	9.0 oz/255 grams
Certifications (when product is marked)	c-**UL**-us UL Listed Industrial Control Equipment, certified for US and Canada c-**UL**-us UL Listed for Class I, Division 2, Groups A, B, C, and D Hazardous locations, certified for US and Canada **CE**[2] European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity **C-Tick**[2] Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions **ODVA** ODVA conformance tested to EtherNet/IP specifications

1 Use this conductor category information for planning conductor routing as described in publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."

2 See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1734-AENT Adapter Web Pages

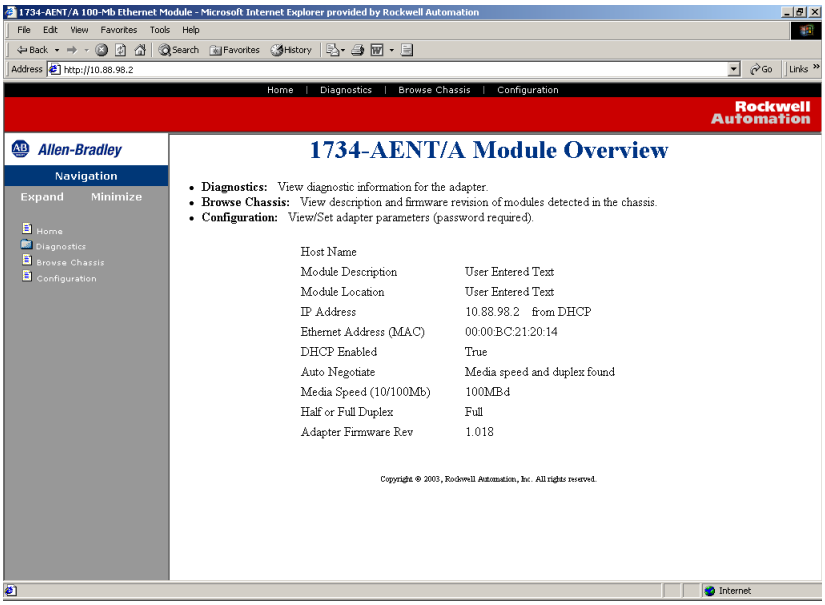
Web Page Diagnostics

The 1734-AENT adapter's Web pages offer extensive internal and network diagnostics. To view the Web pages, enter the adapter's IP address into Netscape or Microsoft Internet Explorer. You will see the Web page shown below:

IMPORTANT Make sure that your PC Internet LAN setting and your TCP/IP settings are configured to access the subnet on which your adapter communicates.

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.



The adapter's Web pages provide the following:

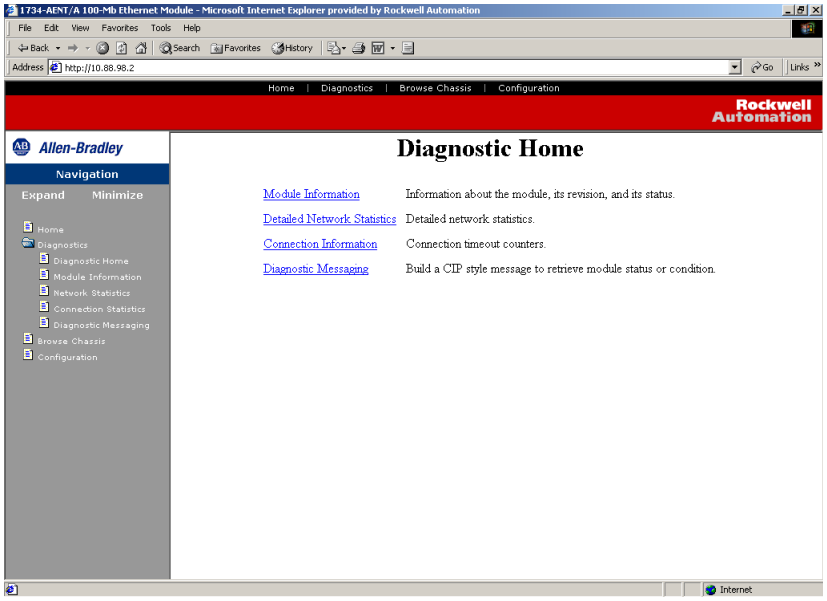
- Diagnostic information
- Browse Chassis capability
- Configuration information

Some examples of these pages are shown on the following figures.

Diagnostic Information

From the **Diagnostic Home** page you can access other diagnostic web pages, including:

- Module Information
- Detailed Network Statistics
- Connection Information
- Diagnostic Messaging

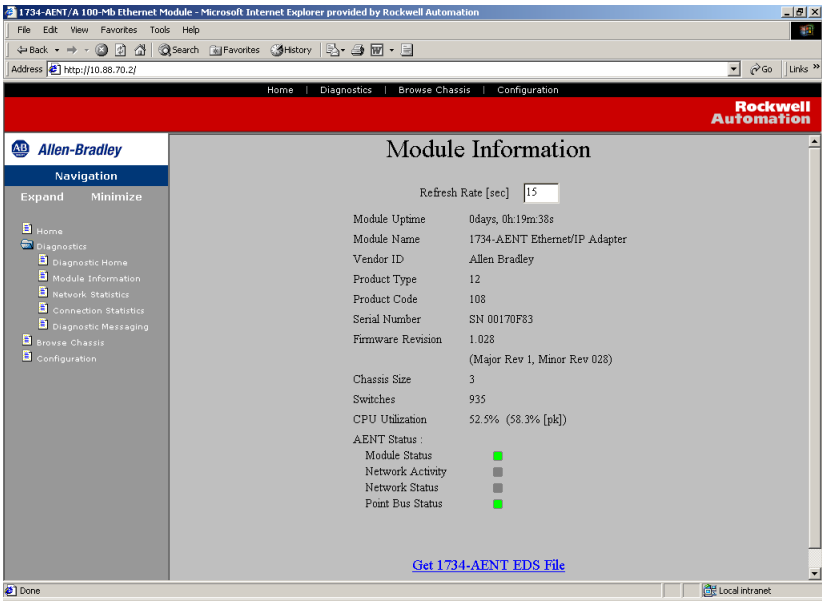


Module Information

On the **Module Information** page, you can obtain module specifications, such as the module name, module uptime information, vendor ID, product type, product code, firmware revision, status switches, and CPU utilization.

EDS Files

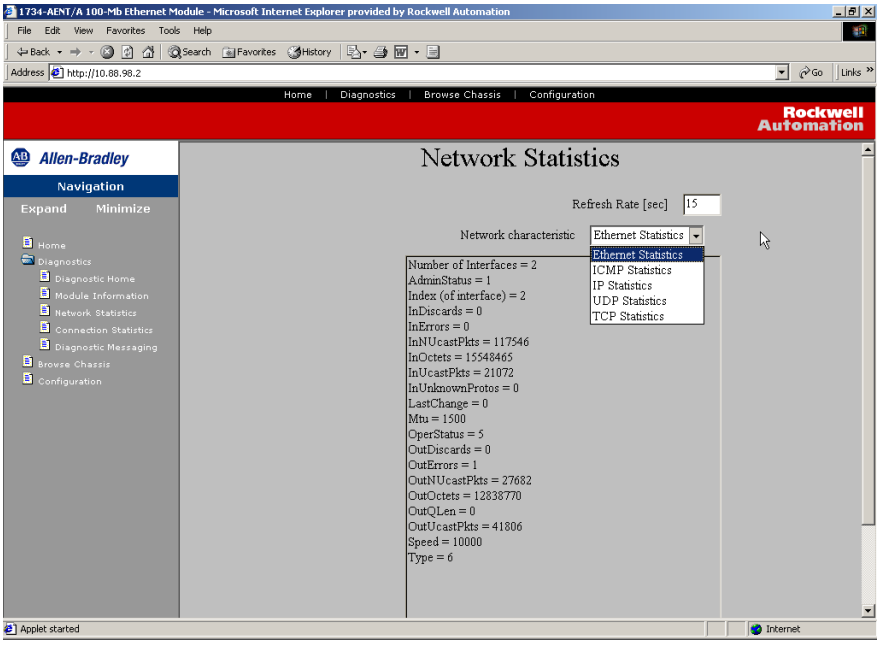
You can access the 1734-AENT EDS files from the **Module Information** page. These EDS files are coming from your adapter. You can also be directed to access other modules' EDS files from the **Module Information** page. Click on the **Get 1734-AENT EDS File** link to download a zip file that will contain the adapter's EDS file.



Network Statistics

The **Network Statistics** page provides information that echoes the state of The Network Statistics page provides information that echoes the state of the module. You can obtain statistics for the following networks:

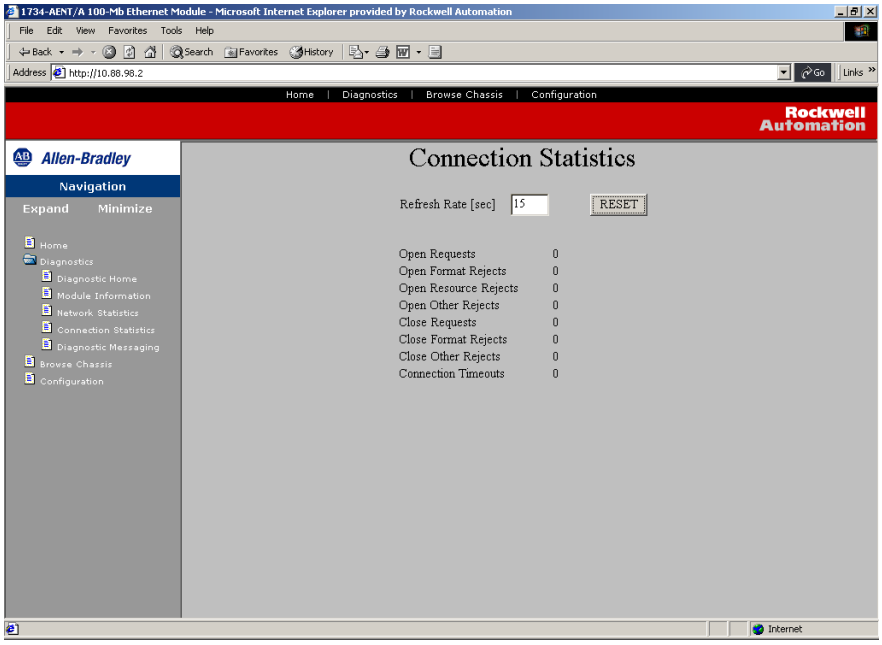
- Ethernet
- ICMP
- IP
- UDP
- TCP



Connection Statistics

The **Connection Statistics** page list CIP-related statistic and connection activity. You can obtain the following statistics:

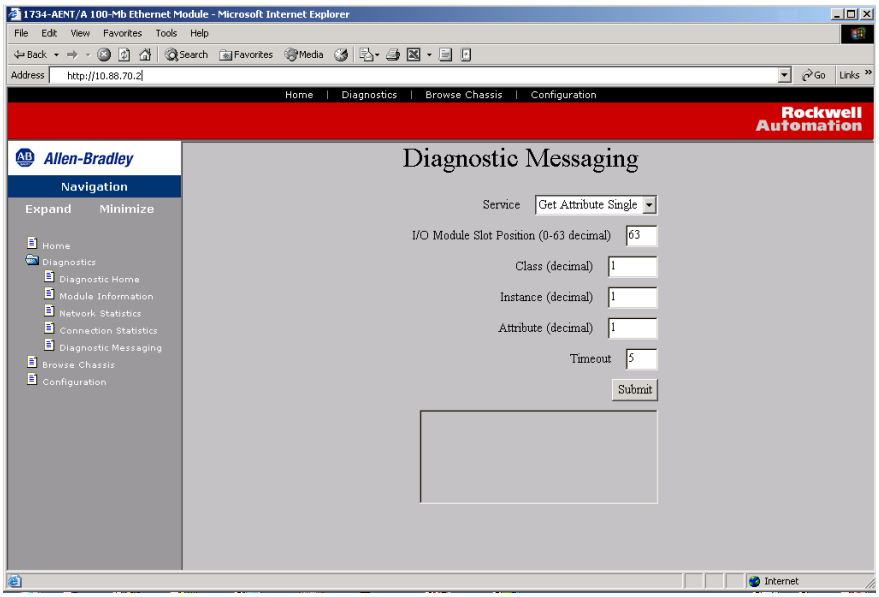
- requests
- rejects
- timeouts



Diagnostic Messaging

The **Diagnostic Messaging** page lets you retrieve module status or conditions, such as:

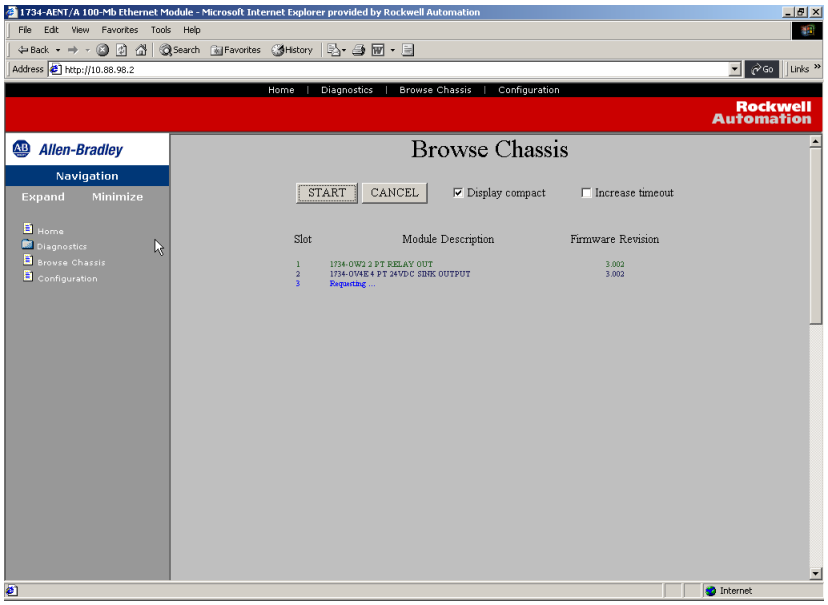
- Service
- I/O slot position
- Class
- Instance
- Attribute
- Timeout



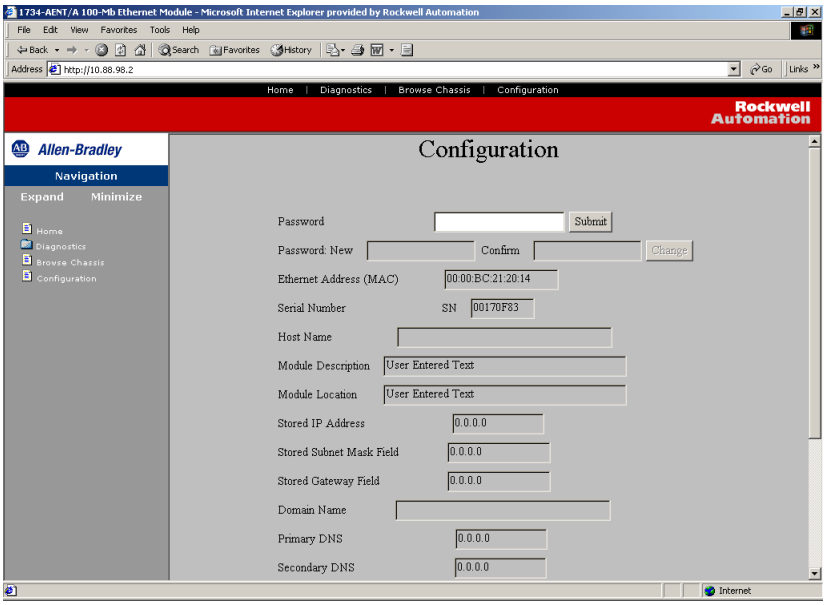
Browse Chassis

Browse the chassis to see what modules are present on the system. A query will run from slot 1 to slot 63. The **Browse Chassis** page will display the modules that were found based on this query. The **Browse Chassis** page provides an easy and helpful way to see what modules the adapter is recognizing on your system.

- Select the **Display compact** button so a check mark appears to decrease the font size. This may make it easier to read the screen.
- Select the **Increase timeout** button so a check mark appears to increase the time of the browse query. This will increase the time the modules are given to respond to the query. This function is useful when you are browsing a busy system.



Configuration



The **Configuration** page provides a way for you to configure the TCP/IP parameters for your adapter, such as, Host Name, IP Address, Gateway Address, Subnet Mask, etc.

By default, the password for the screen is **password** (case sensitive). Once you enter the password and click the **Submit** button, you can enter a new password. Click the **Change** button to accept the new password.

Entering module information in the **Host Name**, **Module Description**, and **Module Location** fields. The description and location will help you quickly and easily identify where the module is in the facility.

As you enter the parameters in the field and press the **Enter** or **Update** (on the web page) key, the field will turn blue to indicate that the value is accepted.

For security purposes, you can disable the adapter's web pages. Click in the box to the right of **Disable Web Server** so a check mark appears to disable this page.

You have 10 minutes to make changes on this page and to save the new data. A timer on the top of the page helps you keep track of the elapsed time. The timer is enabled after you enter the password and click the **Submit** button.

IMPORTANT The values on this page are in non-volatile memory. Changes to these parameters do not take effect until the 1734-AENT has been reset or the power has been cycled.

IMPORTANT

If you set the thumbwheels on the 1734-AENT to the value 888 and then power cycle the module, the following will occur:

- the DHCP Enabled function will be enabled (set to True)
- the Ethernet link will be negotiated automatically (the Auto Negotiate function will be set to True)
- the web server will be enabled (the Disabled Web Server function will be disabled)
- the password for this page will reset to the factory default (the word "password" is the factory default password)

Note the value of the switches before you enter the 888 value because you will return the adapter to those values once this process is complete.

Notes:

Configure the RSLinx Ethernet Communication Driver

What This Appendix Contains

In order to communicate with your 1734-AENT adapter over your network you must configure the RSLinx Ethernet communication driver (AB_ETH) or the EtherNet/IP driver (AB-ETHIP). You can configure the AB_ETH driver with the IP addresses of all the Ethernet devices on your system. You will need one of these drivers to download the example application programs in this manual.

The following table lists the contents of this appendix and where to find specific information:

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Install the RSLinx Software

Use the following procedure to install RSLinx software on your computer.

1. Insert the CD in the CD-ROM drive.

   Note: The CD-ROM supports Windows Autorun. Once inserted into the CD-ROM drive, if you have Autorun configured, the installation will automatically start at the first setup screen.

   If Autorun is not configured for your CD-ROM drive, go to step 2.

2. From the **Start** menu, choose **Run**.

   You will see the **Run** pop-up window.

3. Type **d:/setup** (if it doesn't appear automatically), where **d:** is your CD-ROM driver letter.

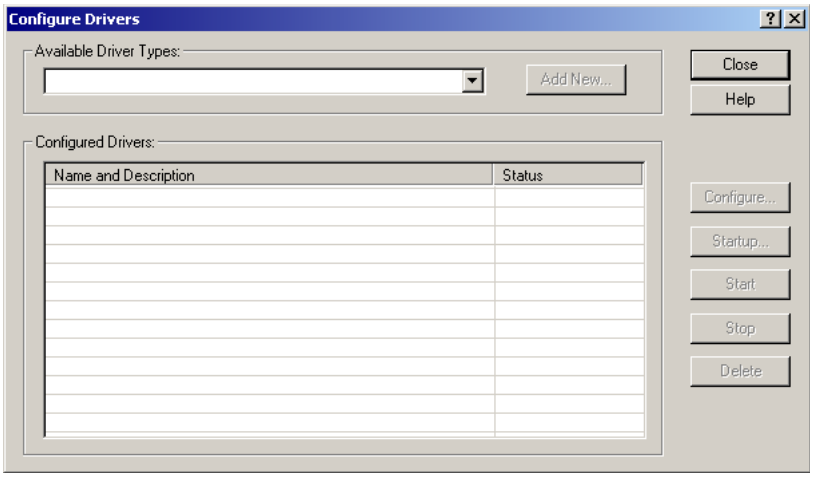
4. Click on **OK**.

You will see the progress bar, followed by the welcome screen.

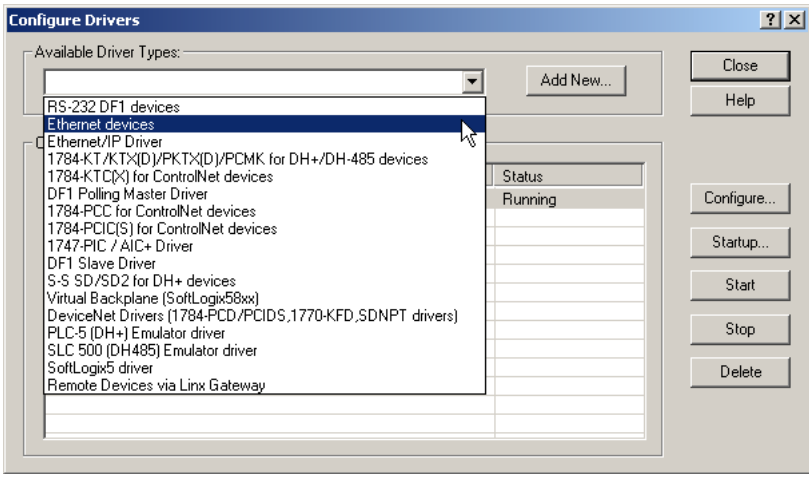
Configure the AB_ETH Driver

To configure the AB-ETH Ethernet communication driver perform the following steps:

1. Start **RSLinx**.
2. From the **Communications** menu, select **Configure Drivers**.

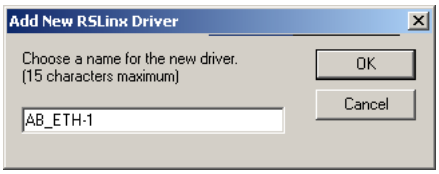


3. Click on the arrow to the right of the **Available Driver Types** box. The **Available Driver Types** list will appear.
4. Select **Ethernet Devices** and click on **Add/New**.



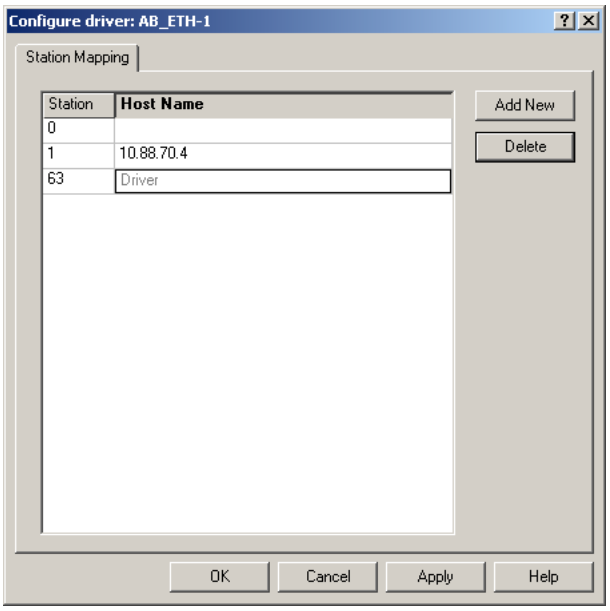
You will be prompted to name the driver.

5. Select the default driver name (e.g., AB_ETH-1) or type in your own name and click on **OK**.



The **Configure driver** window will appear with the **Station Mapping** page open.

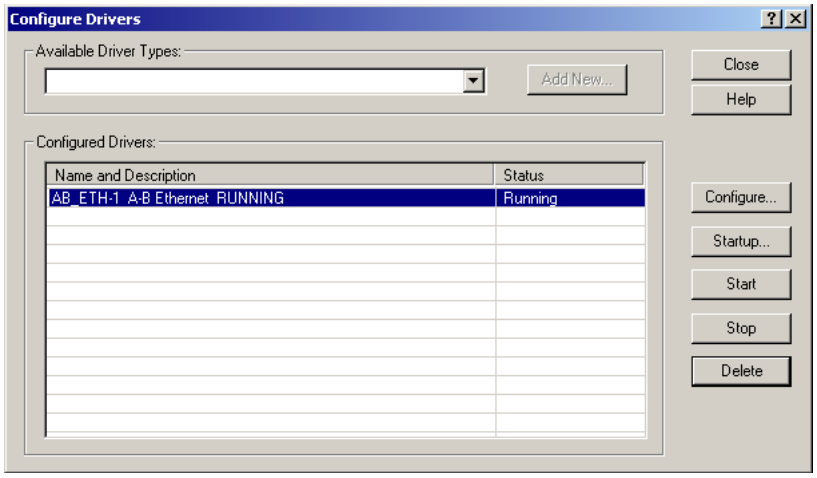
6. Click on **Add New** and enter the IP address or Host Name of your Ethernet device (e.g., 10.88.70.4, “Pump1”, etc.).



7. Repeat step 6 for each additional Ethernet device you need to access.

8. When you are done entering the IP addresses, click on **Apply**. Then click on **OK** to close the **Configure driver** window.

The new driver will appear in the list of configured drivers. (Your list will display the drivers you have configured on your workstation.)

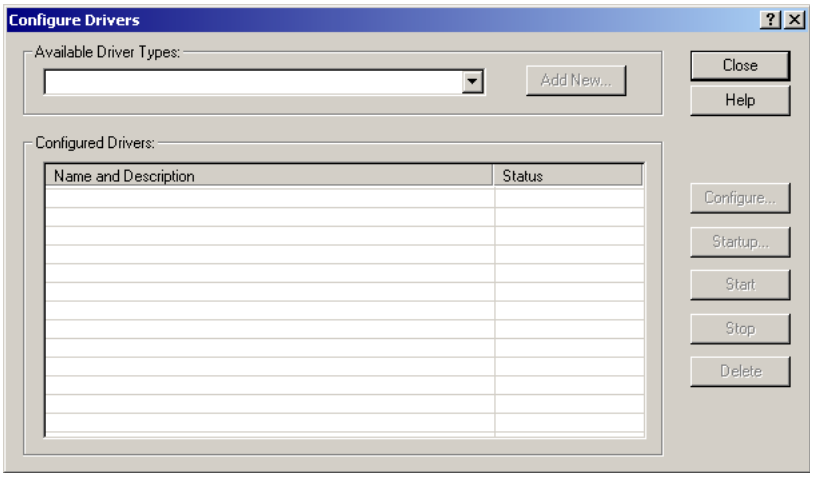


9. Close RSLinx.

Configure the AB_ETH/IP Driver

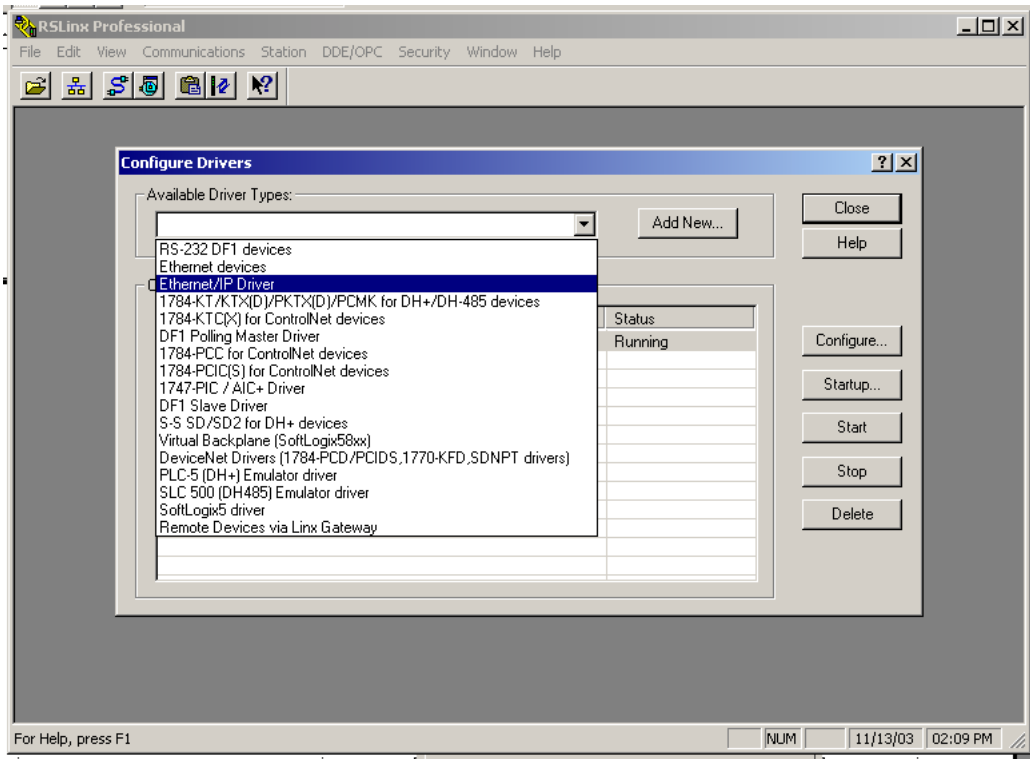
To configure the AB-ETHIP Ethernet communication driver perform the following steps:

1. Start **RSLinx**.
2. From the **Communications** menu, select **Configure Drivers**.

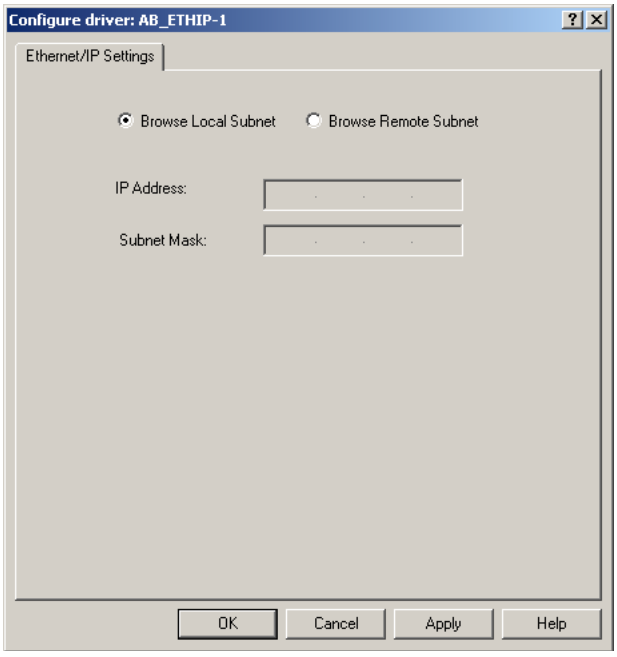


3. Click on the arrow to the right of the **Available Driver Types** box. The **Available Driver Types** list will appear.

4. Select **EtherNet/IP Devices** and click on **Add/New**.



You see this window.

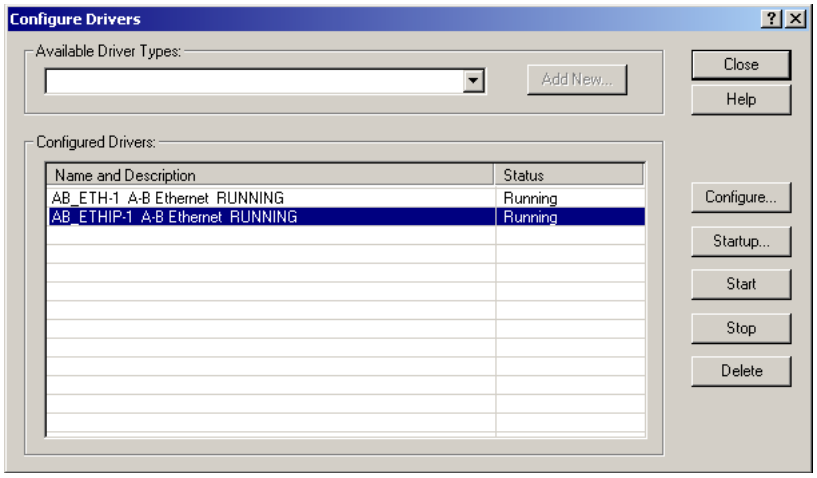


5. Make sure the **Browse Local Subnet** button is selected.

RSLinx will browse your local subnet and automatically read the IP address.

6. Click **OK**.

   The AB-ETHIP driver is now configured and appears in the configured drivers window.



7. Close RSLinx.

1734-POINT I/O Module/RSLogix 5000 Controller Tag Reference

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

1734 POINT I/O Catalog Numbers

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
Digital Modules	
1734-IA2/C	2 POINT 120V AC Input
1734-IB2/C	2 POINT 10V-28V DC Input, Sink
1734-IB4/C	4 POINT 10V-28V DC Input, Sink
1734-IM2/C	2 POINT 240V AC Input
1734-IV2/C	2 POINT 10V-28V DC Input, Source
1734-IV4/C	4 POINT 10V-28V DC Input, Source
1734-OA2/C	2 POINT 120V AC Output
1734-OB2E/C	2 POINT 10V-28V DC Electronically Fused Output, Source
1734-OB2EP/C	2 POINT 10V-28V DC Electronically Fused Protected Output, Source
1734-OB4E/C	4 POINT 10V-28V DC Electronically Fused Output, Source
1734-OV2E/C	2 POINT 10V-28V DC Electronically Fused Output, Sink
1734-OV4E/C	4 POINT 10V-28V DC Electronically Fused Output, Sink
1734-OW2/C	2 POINT AC/DC Relay Output
1734-OX2/C	2 POINT Relay Output N.O./N.C.
Analog Modules	
1734-IE2C/C	2 Channel Analog Current Input
1734-IE2V/C	2 Channel Analog Voltage Input
1734-IR2/C	2 Channel RTD Input
1734-IT2I/C	2 Channel Thermocouple Input, Isolated
1734-OE2C/C	2 Channel Analog Current Output
1734-OE2V/C	2 Channel Analog Voltage Output

1734 POINT I/O Catalog Number	RSLogix5000 Module Description
Specialty I/O	
1734-232ASC/C	1 Channel ASCII Interface Module
1734-IJ/C	1 Channel 5V DC Encoder/Counter
1734-IK/C	1 Channel 15-24V DC Encoder/Counter
1734-SSI/C	1 Channel Synchronous Serial Interface
1734-VHSC24/C	1 Channel 15-24V DC Very High Speed Counter
1734-VHSC5/C	1 Channel 5V DC Very High Speed Counter

Note that all POINT I/O modules must be Series C or above for RSLogix5000 V.11 compatibility.

The 1734-232ASC/A (Series A) is presently the only exception to the Series C requirement. It can be used in RSLogix 5000 V.11 with a Generic Profile, OR it can be used in RSLogix 5000 V.12 with a Thin Profile.

Valid Number Ranges for RSLogix 5000 Data Types

Type	Number of Bits	Range
BIT	1 Bit	0 or 1
SINT	8 Bit	-128 to +127
INT	16 Bit	-32,768 to 32,767
DINT	32 Bit	-2,147,483,648 to 2,147,483,647

Accepted parameter values are dependent on POINT I/O Module type and Tag type.

Discrete 2 POINT Input

1734-IA2
2 POINT 120V AC Input

1734-IB2
2 POINT 10V-28V DC Input, Sink

1734-IM2
2 POINT 240V AC Input

1734-IV2
2 POINT 10V-28V DC Input, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Filter Off On Time - POINT 0	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 0	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter Off On Time - POINT 1	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 1	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)

Input Data	Data Type	Default Value	Valid Data Values
Input Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Output Data	Data Type	Default Value	Valid Data Values
None			

* POINT I/O Modules support the Unsigned Integer data type UINT (0-65,535 range).

RSLogix 5000 supports the signed Integer data type INT (-32,768 to +32,767 range).

Filter Time Note:

To enter Filter values from +32,768 to +65,535 µs, use this conversion formula:

Desired Filter Value (in µs) - 65536 = Entered Filter Value (in µs).
Example: For a 40ms filter time, 40000 - 65536 = -25536

Discrete 4 POINT Input

1734-IB4
4 POINT 10V-28V DC Input, Sink

1734-IV4
4 POINT 10V-28V DC Input, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Filter Off On Time - POINT 0	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 0	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter Off On Time - POINT 1	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 1	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter Off On Time - POINT 2	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 2	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter Off On Time - POINT 3	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)
Filter On Off Time - POINT 3	INT	1,000	-32,768 to 32,767 µs * (0 - 65,535)

Input Data	Data Type	Default Value	Valid Data Values
Input Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

Output Data	Data Type	Default Value	Valid Data Values
None			

* POINT I/O Modules support the Unsigned Integer data type UINT (0-65,535 range).

RSLogix 5000 supports the signed Integer data type INT (-32,768 to +32,767 range).

Filter Time Note

To enter Filter values from +32,768 to +65,535 µs, use this conversion formula:

Desired Filter Value (in µs) - 65536 = Entered Filter Value (in µs).
Example: For a 40ms filter time, 40000 - 65536 = -25536

Discrete 2 POINT Output – Without Diagnostic Status

1734-OA2
2 POINT 120V AC Output

1734-OW2
2 POINT AC/DC Relay Output

1734-OX2
2 POINT Relay Output N.O./N.C.

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Input Data	Data Type	Default Value	Valid Data Values
None			

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Discrete 2 POINT Output – With Over Load and Open Load Diagnostic Status

1734-OB2E
2 POINT 10V-28V DC Electronically Fused Output, Source

1734-OB2EP
2 POINT 10V-28V DC Electronically Fused Protected Output, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
No Load Enable - POINT 0, 1 (Wire Off Diagnostic)	SINT, BIT	1	0=Disabled **1=Enabled**
Auto Restart Enable - POINT 0, 1 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1 (Open Load or Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1 (Open Load or Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Discrete 2 POINT Output – With Over Load Diagnostic Status

1734-OV2E
2 POINT 10V-28V DC Electronically Fused Output, Sink

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On
Auto Restart Enable - POINT 0, 1 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1 (Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1 (Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1	SINT, BIT	0	**0=Off** 1=On

Discrete 4 POINT Output – With Over Load and Open Load Diagnostic Status

1734-OB4E
4 POINT 10V-28V DC Electronically Fused Output, Source

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
No Load Enable - POINT 0, 1, 2, 3 (Wire Off Diagnostic)	SINT, BIT	1	0=Disabled **1=Enabled**
Auto Restart Enable - POINT 0, 1, 2, 3 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1, 2, 3 (Open Load or Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1, 2, 3 (Open Load or Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

Discrete 4 POINT Output – With Over Load Diagnostic Status

1734-OV4E
4 POINT 10V-28V DC Electronically Fused Output, Sink

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Fault Value** 1=Hold Last State
Fault Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Program Mode - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Program Value** 1=Hold Last State
Program Value - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On
Auto Restart Enable - POINT 0, 1, 2, 3 (Over Load Behavior)	SINT, BIT	0	**0=Latch Off** 1=Auto Retry
Fault Latch Enable - POINT 0, 1, 2, 3 (Over Load)	SINT, BIT	0	**0=No Latching** 1=Alarms Latch

Input Data	Data Type	Default Value	Valid Data Values
Status Data - POINT 0, 1, 2, 3 (Over Load)	SINT, BIT	0	**0=Off** 1=On (Load Fault)

Output Data	Data Type	Default Value	Valid Data Values
Output Data - POINT 0, 1, 2, 3	SINT, BIT	0	**0=Off** 1=On

Analog 2 Channel Input

1734-IE2C
2 Channel Analog Current Input

Configuration Data	Data Type	Default Value	Valid Data Values
Low Engineering Channel 0	INT	3,277	-32,768 to 32,767
High Engineering Channel 0	INT	16,383	-32,768 to 32,767
Digital Filter Channel 0	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 0	INT	3,113	-32,768 to 32,767
High Alarm Limit Channel 0	INT	16,547	-32,768 to 32,767
Low Low Alarm Limit Channel 0	INT	2,867	-32,768 to 32,767
High High Alarm Limit Channel 0	INT	16,793	-32,768 to 32,767
Range Type Channel 0	SINT	3	**3=4-20mA** 8=0-20mA
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Low Engineering Channel 1	INT	3,277	-32,768 to 32,767
High Engineering Channel 1	INT	16,383	-32,768 to 32,767
Digital Filter Channel 1	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 1	INT	3,113	-32,768 to 32,767
High Alarm Limit Channel 1	INT	16,547	-32,768 to 32,767
Low Low Alarm Limit Channel 1	INT	2,867	-32,768 to 32,767
High High Alarm Limit Channel 1	INT	16,793	-32,768 to 32,767
Range Type Channel 1	SINT	3	**3=4-20mA** 8=0-20mA
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Notch Filter **(Channel 0 & 1)**	SINT	2	1=50Hz **2=60Hz** 4=250Hz 6=500Hz
Real Time Sample **(Channel 0 & 1)**	INT	100	0 to 10,000 ms

1734-IE2C
2 Channel Analog Current Input

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-IE2V
2 Channel Analog Voltage Input

Configuration Data	Data Type	Default Value	Valid Data Values
Low Engineering Channel 0	INT	0	-32,768 to 32,767
High Engineering Channel 0	INT	10,000	-32,768 to 32,767
Digital Filter Channel 0	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 0	INT	500	-32,768 to 32,767
High Alarm Limit Channel 0	INT	9,500	-32,768 to 32,767
Low Low Alarm Limit Channel 0	INT	200	-32,768 to 32,767
High High Alarm Limit Channel 0	INT	9,800	-32,768 to 32,767
Range Type Channel 0	SINT	2	0=-10 to +10V 2=0 to 10V
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Low Engineering Channel 1	INT	0	-32,768 to 32,767
High Engineering Channel 1	INT	10,000	-32,768 to 32,767
Digital Filter Channel 1	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 1	INT	500	-32,768 to 32,767
High Alarm Limit Channel 1	INT	9,500	-32,768 to 32,767
Low Low Alarm Limit Channel 1	INT	200	-32,768 to 32,767
High High Alarm Limit Channel 1	INT	9,800	-32,768 to 32,767
Range Type Channel 1	SINT	2	0=-10 to +10V **2=0 to 10V**
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Notch Filter **(Channel 0 & 1)**	SINT	2	1=50Hz **2=60Hz** 4=250Hz 6=500Hz
Real Time Sample **(Channel 0 & 1)**	INT	100	0 to 10,000 ms

1734-IE2V
2 Channel Analog Voltage Input

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange

Output Data	Data Type	Default Value	Valid Data Values
None			

1734-IR2
2 Channel RTD Input

Configuration Data	Data Type	Default Value	Valid Data Values
Low Engineering Channel 0	INT	1,000	-32,768 to 32,767
High Engineering Channel 0	INT	5,000	-32,768 to 32,767
Digital Filter Channel 0	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 0	INT	-32,768	-32,768 to 32,767
High Alarm Limit Channel 0	INT	32,767	-32,768 to 32,767
Low Low Alarm Limit Channel 0	INT	-32,768	-32,768 to 32,767
High High Alarm Limit Channel 0	INT	32,767	-32,768 to 32,767
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Sensor Type Channel 0	SINT	1	0=Ohms **1=100 Ω Pt α385** 2=200 Ω Pt α385 5=100 Ω JPt α3916 6=200 Ω JPt α3916 9=10 Ω Cu α427 10=120 Ω Ni α672 11=100 Ω Ni α618 12=120 Ω Ni α618
Temperature Mode Channel 0	SINT	1	0=Custom Scale **1=°C** 2=°F 3=°K 4=°R
Low Engineering Channel 1	INT	1,000	-32,768 to 32,767
High Engineering Channel 1	INT	5,000	-32,768 to 32,767
Digital Filter Channel 1	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 1	INT	-32,768	-32,768 to 32,767
High Alarm Limit Channel 1	INT	32,767	-32,768 to 32,767
Low Low Alarm Limit Channel 1	INT	-32,768	-32,768 to 32,767
High High Alarm Limit Channel 1	INT	32,767	-32,768 to 32,767
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

1734-IR2
2 Channel RTD Input

Configuration Data	Data Type	Default Value	Valid Data Values
Sensor Type Channel 1	SINT	1	0=Ohms **1=100 Ω Pt α385** 2=200 Ω Pt α385 5=100 Ω JPt α3916 6=200 Ω JPt α3916 9=10 Ω Cu α427 10=120 Ω Ni α672 11=100 Ω Ni α618 12=120 Ω Ni α618
Temperature Mode Channel 1	SINT	1	0=Custom Scale **1=°C** 2=°F 3=°K 4=°R
Notch Filter **(Channel 0 & 1)**	SINT	1	0=50Hz **1=60Hz** 2=100Hz 3=120Hz 4=200Hz 5=240Hz 6=300Hz 7=400Hz 8=480Hz

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Output Data	**Data Type**	**Default Value**	**Valid Data Values**
None			

1734-IT2
2 Channel Thermocouple Input, Isol.

Configuration Data	Data Type	Default Value	Valid Data Values
Cold Junction Notch Filter	SINT	1	0=50Hz **1=60Hz**
Cold Junction Mode	SINT	1	0=None **1=Channel 0** 2=Channel 1 3=Average Both
Low Engineering Channel 0	INT	0	-32,768 to 32,767
High Engineering Channel 0	INT	7,000	-32,768 to 32,767
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Notch Filter Channel 0	SINT	1	0=50Hz **1=60Hz** 2=100Hz 3=120Hz 4=200Hz 5=240Hz 6=300Hz 7=400Hz 8=480Hz
Sensor Type Channel 0	SINT	5	0=mV 1=B 2=C 3=E 4=J **5=K** 6=N 7=R 8=S 9=T
Digital Filter Channel 0	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 0	INT	-32,768	-32,768 to 32,767
High Alarm Limit Channel 0	INT	32,767	-32,768 to 32,767
Low Low Alarm Limit Channel 0	INT	-32,768	-32,768 to 32,767
High High Alarm Limit Channel 0	INT	32,767	-32,768 to 32,767

1734-IT2
2 Channel Thermocouple Input, Isol.

Configuration Data	Data Type	Default Value	Valid Data Values
Temperature Mode Channel 0	SINT	1	0=mV/Custom Scale **1=°C** 2=°F 3=°K 4=°R
Cold Junction Enable Channel 0	SINT	1	0=Disabled **1=Enabled**
Cold Junction Offset Channel 0	INT	0	0 to 7,000 (0.00-70.00)
Low Engineering Channel 1	INT	0	-32,768 to 32,767
High Engineering Channel 1	INT	7,000	-32,768 to 32,767
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Notch Filter Channel 1	SINT	1	0=50Hz **1=60Hz** 2=100Hz 3=120Hz 4=200Hz 5=240Hz 6=300Hz 7=400Hz 8=480Hz
Sensor Type Channel 1	SINT	5	0=mV 1=B 2=C 3=E 4=J **5=K** 6=N 7=R 8=S 9=T
Digital Filter Channel 1	INT	0	0 to 10,000 ms
Low Alarm Limit Channel 1	INT	-32,768	-32,768 to 32,767
High Alarm Limit Channel 1	INT	32,767	-32,768 to 32,767
Low Low Alarm Limit Channel 1	INT	-32,768	-32,768 to 32,767
High High Alarm Limit Channel 1	INT	32,767	-32,768 to 32,767

1734-IT2
2 Channel Thermocouple Input, Isol.

Configuration Data	Data Type	Default Value	Valid Data Values
Temperature Mode Channel 1	SINT	1	0=mV/Custom Scale **1=°C** 2=°F 3=°K 4=°R
Cold Junction Enable Channel 1	SINT	1	0=Disabled **1=Enabled**
Cold Junction Offset Channel 1	INT	0	0 to 7,000 (0.00-70.00)

Input Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm Bit 4 LowLowAlarm Bit 5 HighHighAlarm Bit 6 Underrange Bit 7 Overrange
Cold Junction Data	INT	0	-32,768 to 32,767

Output Data	Data Type	Default Value	Valid Data Values
None			

Analog 2 Channel Output

1734-OE2C
2 Channel Analog Current Output

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Value Channel 0	INT	0	-32,768 to 32,767
Program Value Channel 0	INT	0	-32,768 to 32,767
Low Engineering Channel 0	INT	1,638	-32,768 to 32,767
High Engineering Channel 0	INT	8,191	-32,768 to 32,767
Low Limit Channel 0	INT	-32,768	-32,768 to 32,767
High Limit Channel 0	INT	32,767	-32,768 to 32,767
Range Type Channel 0	SINT	0	**0=4-20mA** 2=0-20mA
Fault Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Fault Value Channel 1	INT	0	-32,768 to 32,767
Program Value Channel 1	INT	0	-32,768 to 32,767
Low Engineering Channel 1	INT	1,638	-32,768 to 32,767
High Engineering Channel 1	INT	8,191	-32,768 to 32,767
Low Limit Channel 1	INT	-32,768	-32,768 to 32,767
High Limit Channel 1	INT	32,767	-32,768 to 32,767
Range Type Channel 1	SINT	0	**0=4-20mA** 2=0-20mA
Fault Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value

1734-OE2C
2 Channel Analog Current Output

Configuration Data	Data Type	Default Value	Valid Data Values
Idle Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

Input Data	Data Type	Default Value	Valid Data Values
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm

Output Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767

1734-OE2V
2 Channel Analog Voltage Output

Configuration Data	Data Type	Default Value	Valid Data Values
Fault Value Channel 0	INT	0	-32,768 to 32,767
Program Value Channel 0	INT	0	-32,768 to 32,767
Low Engineering Channel 0	INT	0	-32,768 to 32,767
High Engineering Channel 0	INT	10,000	-32,768 to 32,767
Low Limit Channel 0	INT	-32,768	-32,768 to 32,767
High Limit Channel 0	INT	32,767	-32,768 to 32,767
Range Type Channel 0	SINT	1	**1=0 to 10V** 3=-10 to +10V
Fault Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 0	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Limit Alarm Latch Channel 0	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 0	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled
Fault Value Channel 1	INT	0	-32,768 to 32,767
Program Value Channel 1	INT	0	-32,768 to 32,767
Low Engineering Channel 1	INT	0	-32,768 to 32,767
High Engineering Channel 1	INT	10,000	-32,768 to 32,767
Low Limit Channel 1	INT	-32,768	-32,768 to 32,767
High Limit Channel 1	INT	32,767	-32,768 to 32,767
Range Type Channel 1	SINT	1	**1=0 to 10V** 3=-10 to +10V
Fault Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value
Idle Mode Channel 1	SINT	1	0=Hold Last State **1=Go to Low Clamp** 2=Go to High Clamp 3=Go to Fault Value

1734-OE2V
2 Channel Analog Voltage Output

Configuration Data	Data Type	Default Value	Valid Data Values
Limit Alarm Latch Channel 1	SINT	0	**0=No Latching** 1=Alarms Latch
Alarm Disable Channel 1	SINT	0	**0=Alarms Enabled** 1=Alarms Disabled

Input Data	Data Type	Default Value	Valid Data Values
Status Byte Channel 0	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm
Status Byte Channel 1	SINT	0	Bit 0 Fault Bit 1 Calibration Bit 2 LowAlarm Bit 3 HighAlarm

Output Data	Data Type	Default Value	Valid Data Values
Data Channel 0	INT	0	-32,768 to 32,767
Data Channel 1	INT	0	-32,768 to 32,767

Specialty I/O

1734-VHSC24
1 Channel 15-24V DC Very High Speed Counter

1734-VHSC5
1 Channel 5V DC Very High Speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Counter Config	SINT	0	
Config_0	BIT 0		**0000=0=Counter**
Config_1	BIT 1		0001=1=Encoder X1
Config_2	BIT 2		0010=2=Encoder X2
Config_3	BIT 3		0011=3=PWM 0100=4=Encoder X4 0101=5=Period/Rate 0110=6=Continuous/Rate 0111=7=Rate Measurement 1000=8=Pulse Generator
Mode_4	BIT 4		**000=Store Count Disable**
Mode_5	BIT 5		001=Store/Continue
Mode_6	BIT 6		010=Store/Wait/Resume 011=Store,Reset/Wait/Start 100=Store,Reset/Start
Z Input	BIT 7		**0=Z Input Not Inverted** 1=Z Input Is Inverted
Filter	SINT	120	
Filter_0	BIT 0	(0x78H)	0000=No Filter
Filter_1	BIT 1		0001=50 KHz
Filter_2	BIT 2		0010=5 KHz
Filter_3	BIT 3		0100=500 Hz **1000=50 Hz**
FilterA	BIT 4		0=Input A/B/Z Not Filtered
FilterB	BIT 5		**1=Input A/B/Z Is Filtered**
FilterZ	BIT 6		
Decimal Position	SINT	0	Counter Config 0, 1, 2, 3, 4: -128 to +127 (0 - 255) Counter Config 5, 6, & 7: -4 to +2
Time Base (in 10 ms intervals)	INT	0	Counter Config 3 & 7 only: 0-3000 ms (10 ms to 3 sec)
Gate Interval (Product of Time Base x Gate Interval must be ≤ 3000 ms)	SINT	0	Counter Config 3 & 7 only: -128 to +127 (0 - 200)

1734-VHSC24
1 Channel 15-24V DC Very High Speed Counter

1734-VHSC5
1 Channel 5V DC Very High Speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Scalar	SINT	0	Counter Config 5, 6, 8 only: -128 to +127 (0 - 255) Single Bit only: 0, 1, 2, 4, 8, 16, 32, 64, -128
Output Ties 0 Out 0 Window 1 Out 0 Window 2 Out 0 Window 3 Out 0 Window 4	SINT BIT 0 BIT 1 BIT 2 BIT 3	0	 **0=Output 0 Not Tied** 1=Output 0 Tied to Window Counter Config 3 (PWM): Output 0 Window 1 PWM In
Output Ties 1 Out 1 Window 1 Out 1 Window 2 Out 1 Window 3 Out 1 Window 4	SINT BIT 0 BIT 1 BIT 2 BIT 3	0	 **0=Output 1 Not Tied** 1=Output 1 Tied to Window Counter Config 3 (PWM): Output 1 Window 1 PWM In
Rollover	DINT	16,777,215	1 to 16,777,216
Preset (< Rollover)	DINT	0	0 to 16,777,215
On Value 1 Off Value 1 On Value 2 Off Value 2 On Value 3 Off Value 3 On Value 4 Off Value 4	DINT DINT DINT DINT DINT DINT DINT DINT	0 0 0 0 0 0 0 0	Counter Config 3, 5, 6, 7: 0 to 16,777,215 Counter Config 0, 1, 2, 4: 0 to Rollover Value
SS PWM Value (<0 or >9500 =Hold Last State)	INT	0	**0** to 9500 (0.00% to 95.00%)
SS Counter Control SS Counter Reset SS Counter Preset SS Value Reset (Stored / Accum. Count)	SINT BIT 0 BIT 1 BIT 2	0	 **0=Count Unchanged** 1=Count Cleared **0=Count Unchanged** 1=Count Set to Preset **0=Count Unchanged** 1=Count Cleared

1734-VHSC24
1 Channel 15-24V DC Very High Speed Counter

1734-VHSC5
1 Channel 5V DC Very High Speed Counter

Configuration Data	Data Type	Default Value	Valid Data Values
SS Output Control	SINT	0	
SS Out 0 Force	BIT 0		**0=Output Off** 1=Output Forced On
SS Out 0 En	BIT 1		**0=Output Disabled** 1=Output Enabled
SS Out 0 Electronic Fuse	BIT 2		**0=Auto Retry** 1=Latch Off
SS Out 0 Diagnostic Speed	BIT 3		**0=< 8ms Response** 1=50ms Response
SS Out 1 Force	BIT 4		**0=Output Off** 1=Output Forced On
SS Out 1 En	BIT 5		**0=Output Disabled** 1=Output Enabled
SS Out 1 Electronic Fuse	BIT 6		**0=Auto Retry** 1=Latch Off
SS Out 1 Diagnostic Speed	BIT 7		**0=< 8ms Response** 1=50ms Response

To enter values from +128 to +255, use these conversion formulas:

Decimal Position Note:

Desired Decimal Position Value - 256 = Entered Decimal Position Value.
Example: For a divisor of 200, 200 - 256 = -56

Gate Interval Note:

Desired Gate Interval Value - 256 = Entered Gate Interval Value.
Example: For a Gate Interval of 200, 200 - 256 = -56

Scalar Note:

Desired Scalar Value - 256 = Entered Scalar Value.
Example: For a Scalar of 128, 128 - 256 = -128

1734-VHSC24
1 Channel 15-24V DC Very High Speed Counter

1734-VHSC5
1 Channel 5V DC Very High Speed Counter

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	0 to 16,777,215
Stored Data	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Status	INT	0	
Zero Frequency Detected	BIT 1		**0=No Fault** 1=Fault Detected
Stored Data Count_2 Stored Data Count_3	BIT 2 BIT 3		Cycles thru **0,** 1, 2, 3, **0**, Increments after update
A Input Status B Input Status Z Input Status	BIT 4 BIT 5 BIT 6		**0=Input A/B/Z is Off** 1=Input A/B/Z is On
Output Status_8 (Output 0) Output Status_9 (Output 1)	BIT 8 BIT 9		**0=Output is Off** 1=Output is On
Output Fault_10 (Output 0) Output Fault_11 (Output 1)	BIT 10 BIT 11		**0=No Fault** 1=Open or Over Load
Not Ready	BIT 13		**0=Module Ready** 1=Module Initializing
EEPROM Fault	BIT 14		**0=No Fault** 1=EEPROM data bad
Program Fault (incomplete / incorrect / conflict)	BIT 15		**0=No Fault** 1=Bad Configuration (See **Program Fault Note** on the next page)

Stored Data Note:

To interpret values from -2,147,483,648 to -1, use this conversion formula:
Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.
Example: For a read value of -1,794,967,296:
-1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

Program Fault Note

Programming Fault Error bit - If an incomplete, incorrect, or conflicting set of configuration parameters are sent to the module, the Program Fault bit will be asserted and an error code will be placed in the Programming Error Code word (assembly 6816). The module will **not** enter a normal operational state. Bit definitions (decimal) for the error codes are:

10 An invalid assembly was chosen for poll consumption (0, 105 or 106 are valid).

9 The decimal point position is outside of the acceptable range.

8 Counter 0 window ON & OFF values are equal and not zero OR
Counter 0 window ON & OFF value is greater than the Rollover.

7 A tie has been connected to an unprogrammed window.

6 A configuration was selected that requires the scalar and none was programmed OR
Multiple scalars were selected.

5 The preset is out of range (Rollover).

4 A rollover of zero was programmed through PWM was not selected OR
A rollover was programmed and PWM was selected OR
Rollover is out of range (>0x01000000).

3 A configuration requiring a time base was selected and no gate interval was set OR
Gate interval is out of range (>200) OR
Product of time base and gate interval is greater than 3 seconds.

2 A time base was entered that is not a multiple of 10 OR
Time base is out of range (>3000, i.e., 3 seconds).

1 ZF/BF/AF were selected and no filter was programmed OR
Multiple filters were selected.

0 A reserved configuration/mode was programmed.

1734-VHSC24
1 Channel 15-24V DC Very High Speed Counter

1734-VHSC5
1 Channel 5V DC Very High Speed Counter

Output Data	Data Type	Default Value	Valid Data Values
PWM Value	INT	0	**0** to 9500 (**0.00**% to 95.00%)
Counter Control	SINT	0	
Counter Reset	BIT 0	0	**0=Count Unchanged** 1=Count Cleared
Counter Preset	BIT 1	0	**0=Count Unchanged** 1=Count Set to Preset
Value Reset (Stored / Accumulated Count)	BIT 2	0	**0=Count Unchanged** 1=Count Cleared
Output Control	SINT	0	
Output 0 Force	BIT 0	0	**0=Output Off** 1=Output Forced On
Output 0 Enable	BIT 1	0	**0=Output Disabled** 1=Output Enabled
Output 0 Electronic Fuse	BIT 2	0	**0=Auto Retry** 1=Latch Off
Output 0 Diagnostic Speed	BIT 3	0	**0=< 8ms Response** 1=50ms Response
Output 1 Force	BIT 4	0	**0=Output Off** 1=Output Forced On
Output 1 Enable	BIT 5	0	**0=Output Disabled** 1=Output Enabled
Output 1 Electronic Fuse	BIT 6	0	**0=Auto Retry** 1=Latch Off
Output 1 Diagnostic Speed	BIT 7	0	**0=< 8ms Response** 1=50ms Response

1734-IJ
1 Channel 5V DC Encoder / Counter

1734-IK
1 Channel 15-24V DC Encoder / Counter

Configuration Data	Data Type	Default Value	Valid Data Values
Counter Config	SINT	0	
Config_0	BIT 0		**0000=0=Counter**
Config_1	BIT 1		0001=1=Encoder X1
Config_2	BIT 2		0010=2=Encoder X2
Config_3	BIT 3		0100=4=Encoder X4 0101=5=Period/Rate 0111=7=Rate Measurement
Mode_4	BIT 4		**000=Store Count Disable**
Mode_5	BIT 5		001=Store/Continue
Mode_6	BIT 6		010=Store/Wait/Resume 011=Store,Reset/Wait/Start 100=Store,Reset/Start
Z Input	BIT 7		**0=Z Input Not Inverted** 1=Z Input Is Inverted
Filter	SINT	120	
Filter_0	BIT 0	(0x78H)	0000=No Filter
Filter_1	BIT 1		0001=50 KHz
Filter_2	BIT 2		0010=5 KHz
Filter_3	BIT 3		0100=500 Hz **1000=50 Hz**
FilterA	BIT 4		0=Input A/B/Z Not Filtered
FilterB	BIT 5		**1=Input A/B/Z Is Filtered**
FilterZ	BIT 6		
Decimal Position	SINT	0	Counter Config 0, 1, 2, 4: -128 to +127 (0 - 255) Counter Config 5 & 7: -4 to +2
Time Base (in 10 ms intervals)	INT	0	Counter Config 7 only: 0-3000 ms (10 ms to 3 sec)
Gate Interval (Product of Time Base x Gate Interval must be ≤ 3000 ms)	SINT	0	Counter Config 7 only: -128 to +127 (0 - 200)
Scalar	SINT	0	Counter Config 5 only: -128 to +127 (0 - 255) 0, 1, 2, 4, 8, 16, 32, 64, -128
Rollover	DINT	16,777,215	1 to 16,777,216
Preset (< Rollover)	DINT	0	0 to 16,777,215

1734-IJ
1 Channel 5V DC Encoder / Counter

1734-IK
1 Channel 15-24V DC Encoder / Counter

Configuration Data	Data Type	Default Value	Valid Data Values
SS Counter Control	SINT	0	
SS Counter Reset	BIT 0		**0=Count Unchanged** 1=Count Cleared
SS Counter Preset	BIT 1		**0=Count Unchanged** 1=Count Set to Preset
SS Value Reset	BIT 2		**0=Count Unchanged** 1=Count Cleared

To enter values from +128 to +255, use these conversion formulas:

Decimal Position Note:

Desired Decimal Position Value - 256 = Entered Decimal Position Value.
Example: For a divisor of 200, 200 - 256 = -56

Gate Interval Note:

Desired Gate Interval Value - 256 = Entered Gate Interval Value.
Example: For a Gate Interval of 200, 200 - 256 = -56

Scalar Note:

Desired Scalar Value - 256 = Entered Scalar Value.
Example: For a Scalar of 128, 128 - 256 = -128

1734-IJ
1 Channel 5V DC Encoder / Counter

1734-IK
1 Channel 15-24V DC Encoder / Counter

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	0 to 16,777,215
Stored Data	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Status Zero Frequency Detected	INT BIT 1	0	 **0=No Fault** 1=Fault Detected
Stored Data Count_2	BIT 2		Cycles thru **0,** 1, 2, 3, **0**,
Stored Data Count_3	BIT 3		Increments after update
A Input Status B Input Status Z Input Status	BIT 4 BIT 5 BIT 6		**0=Input A/B/Z is Off** 1=Input A/B/Z is On
Not Ready	BIT 13		**0=Module Ready** 1=Module Initializing
EEPROM Fault	BIT 14		**0=No Fault** 1=EEPROM data bad
Program Fault (incomplete / incorrect / conflict)	BIT 15		**0=No Fault** 1=Bad Configuration (See **Program Fault Note** on the next page)

Stored Data Note:

To interpret values from -2,147,483,648 to -1, use this conversion formula:

Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.
Example: For a read value of -1,794,967,296:-1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

Program Fault Note

Programming Fault Error bit - If an incomplete, incorrect, or conflicting set of configuration parameters are sent to the module, the Program Fault bit will be asserted and an error code will be placed in the Programming Error Code word (assembly 6816). The module will **not** enter a normal operational state. Bit definitions (decimal) for the error codes are:

10 An invalid assembly was chosen for poll consumption (0, 105 or 106 are valid).

9 The decimal point position is outside of the acceptable range.

8 Counter 0 window ON & OFF values are equal and not zero OR
Counter 0 window ON & OFF value is greater than the Rollover.

7 A tie has been connected to an unprogrammed window.

6 A configuration was selected that requires the scalar and none was programmed OR
Multiple scalars were selected.

5 The preset is out of range (Rollover).

4 A rollover of zero was programmed through PWM was not selected OR
A rollover was programmed and PWM was selected OR
Rollover is out of range (>0x01000000).

3 A configuration requiring a time base was selected and no gate interval was set OR
Gate interval is out of range (>200) OR
Product of time base and gate interval is greater than 3 seconds.

2 A time base was entered that is not a multiple of 10 OR
Time base is out of range (>3000, i.e., 3 seconds).

1 ZF/BF/AF were selected and no filter was programmed OR
Multiple filters were selected.

0 A reserved configuration/mode was programmed.

1734-IJ
1 Channel 5V DC Encoder / Counter

1734-IK
1 Channel 15-24V DC Encoder / Counter

Output Data	Data Type	Default Value	Valid Data Values
Counter Control	SINT	0	
Counter Reset	BIT 0	0	**0=Count Unchanged** 1=Count Cleared
Counter Preset	BIT 1	0	**0=Count Unchanged** 1=Count Set to Preset
Value Reset (Stored / Accumulated Count)	BIT 2	0	**0=Count Unchanged** 1=Count Cleared

1734-SSI
1 Channel Synchronous Serial Interface

Configuration Data	Data Type	Default Value	Valid Data Values
Run	SINT	1	0=Module Not Running **1=Module Is Running**
Gray Binary	SINT	1	0=Binary Code **1=Gray Code**
Word Length	SINT	13	2 to 31
Data Speed	SINT	5	**5=125K Baud** 6=250K Baud 7=500K Baud 8=1M Baud 9=2M Baud
G2B Convert (Gray to Binary)	SINT	0	**0=No Convert** 1=Convert
Standardization (Divide / Shift using Trailing)	SINT	0	**0=No Standardization** 1=Apply Standardization
SSI Word Delay Time	INT	64	-32,768 to 32,767 µs (16 - 65,535)
Trailing (No. of Trailing Bits)	SINT	0	**0** to 16
Input Latch Control InputLatch_0 InputLatch_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Falling Edge of Input 10=Rising Edge of Input 11=Both Edges of Input
Sensor Resolution (Positions per Rev. or Stroke)	INT	1	-32,768 to 32,767 counts (1 - 65,535)
Sensor Cycle (Total Revolutions or Strokes)	INT	1	-32,768 to 32,767 counts (1 - 65,535)
Compare 0 Value	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Compare 1 Value	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Compare 0 Control Compare0_0 Compare0_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Up Direction 10=Down Direction 11=Both Directions
Compare 1 Control; Compare1_0 Compare1_1	SINT BIT 0 BIT 1	0	**00=Off** 01=Up Direction 10=Down Direction 11=Both Directions

SSI Word Delay Time Note:

To enter Delay values from +32,768 to +65,535 µs, use this conversion formula:

Desired Delay Value (in µs) - 65536 = Entered Delay Value (in µs).
Example: For a 40ms delay time, 40000 - 65536 = -25536

Sensor Resolution Note:

To enter Resolution values from +32,768 to +65,535 µs, use this conversion formula:

Desired Resolution Value - 65536 = Entered Resolution Value.
Example: For a 40,000 count sensor, 40000 - 65536 = -25536

Sensor Cycle Note:

To enter Cycle values from +32,768 to +65,535, use this conversion formula:

Desired Cycle Value - 65536 = Entered Cycle Value.
Example: For 50,000 sensor cycle rotations, 50000 - 65536 = -15536

Compare 0,1 Value Note:

To enter Compare values from +2,147,483,647 to +4,294,967,295, use this conversion formula:

Desired Compare Value - 4,294,967,296 = Entered Compare Value.
Example: For a 3,000,000,000 compare value,
3,000,000,000 - 4,294,967,296 = -1,294,967,296

1734-SSI
1 Channel Synchronous Serial Interface

Input Data	Data Type	Default Value	Valid Data Values
Present Data	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Latched Data	DINT	0	-2,147,483,648 to 2,147,483,647 (0 - 4,294,967,295)
Status	INT	0	
Input Status	BIT 0		**0=Input is Off** 1=Input is On
Run	BIT 1		**0=Module is not Running** 1=Module is Running
Decreasing Count	BIT 2		**0=Count not Decreasing** 1=Count is Decreasing
Increasing Count	BIT 3		**0=Count not Increasing** 1=Count is Increasing
Compare0 Reached Compare1 Reached	BIT 4 BIT 5		**0=Compare not Reached** 1=Compare was Reached
Compare0 Status Compare1 Status	BIT 6 BIT 7		**0=Compare Off** 1=Compare On
Power Fault	BIT 8		**0=No 24Vdc Power Fault** 1=24Vdc Power Fault
Configuration Fault	BIT 9		**0=No FPGA Config Fault** 1=FPGA Config data bad
Communication Fault	BIT 10		**0=No FPGA Comm Fault** 1=FPGA Comm Fault
Input Data Fault	BIT 11		**0=No Input Data Fault** 1=Input Power Fault (short)
Data Latched	BIT 12		**0=Input Data Not Latched** 1=Input Data Latched

Present / Latched Data Note:

To interpret values from -2,147,483,648 to -1, use this conversion formula:

Stored Data Tag Value + 4,294,967,296 = Actual Stored Data Tag Value.
Example: For a read value of -1,794,967,296:
-1,794,967,296 + 4,294,967,296 = 2,500,000,000 actual value

1734-SSI
1 Channel Synchronous Serial Interface

Output Data	Data Type	Default Value	Valid Data Values
Control	SINT	0	
Latch Acknowledge	BIT 0	0	**0=Latch Not Cleared** 1=Latch Cleared
Compare 0 Acknowledge	BIT 1	0	**0=Compare0 Not Reset** 1=Compare0 Reset
Compare 1 Acknowledge	BIT 2	0	**0=Compare1 Not Reset** 1=Compare1 Reset
Compare 0 Select	BIT 3	0	**0=Compare0 Not Selected** 1=Compare0 Selected
Compare 1 Select	BIT 4	0	**0=Compare1 Not Selected** 1=Compare1 Selected

1734-232ASC
1 Channel ASCII Interface Module

Configuration Data	Data Type	Default Value	Valid Data Values
Serial Character Format (ASCII Format: Data Bits / Parity / Stop)	SINT	0	**0=7N2** 1=7E1 2=7O1 3=8N1 4=8N2 5=8E1 6=8O1 7=7E2 8=7O2
Serial Comm Speed (Baud Rate of the Serial Port)	SINT	0	**0=9600** 1=1200 2=2400 3=4800 4=19.2K 5=38.4K
Max Receive Characters	SINT	20	-128 to +127 (0 - 128)
Receive Start Delimiter Mode	SINT	0	**0=No Start Delimiter** 1=Exclude Start Delimiter 2=Include Start Delimiter
Receive Start Delimiter Character	SINT	58 (0x3A)	Any Valid ASCII Character (Default is Colon [:])
Receive Record End Mode	SINT	2	0=No End Delimiter 1=Exclude End Delimiter **2=Include End Delimiter**
Receive End Delimiter	SINT	13 (0x0d)	Any Valid ASCII Character (Default is Carr. Return)
Receive String Data Type	SINT	1	0=Array **1=Short String** 2=String
Pad Mode	SINT	1	0=Pad Mode Disabled **1=Pad Mode Enabled**
Pad Character	SINT	0 (0x00)	Any Valid ASCII Character (Default is NULL)
Receive Swap Mode	SINT	0	**0=Disabled** 1=16-bit Swap Enabled 2=24-bit Swap Enabled 3=32-bit Swap Enabled
DeviceNet Handshake Mode	SINT	1	0=Master/Slave handshake **1=Produce Immediate**
Max Transmit Characters	SINT	20	-128 to +127 (0 - 128)

1734-232ASC
1 Channel ASCII Interface Module

Configuration Data	Data Type	Default Value	Valid Data Values
Transmit End Delimiter Mode	SINT	2	0=No End Delimiter 1=Exclude End Delimiter 2=Include End Delimiter
Transmit End Delimiter Character	SINT	13 (0x0d)	Any Valid ASCII Character (Default is Carr. Return)
Consume String Data Type	SINT	1	0=Array **1=Short String** 2=String
Transmit Swap Mode	SINT	0	**0=Disabled** 1=16-bit Swap Enabled 2=24-bit Swap Enabled 3=32-bit Swap Enabled
DeviceNet Record Header Mode	SINT	0	**0=Transmit Handshake** 1=Transmit Immediate

Transmit Data / Receive Data / Delimiter / Pad Character Note:

Note that “7 data bits” allows ASCII Character data values of 0 - 127, which RSLogix 5000 does support in the signed Short Integer data type SINT (-128 to +127 range).

Note that “8 data bits” allows ASCII Character data values of 0 - 255. To enter values from +128 to +255, use this conversion formula:

Desired Decimal Value - 256 = Entered Decimal Value.
Example: For an ASCII Character value of 128, 128 - 256 = -128

1734-232ASC
1 Channel ASCII Interface Module

Input Data	Data Type	Default Value	Valid Data Values
Receive Record Number	SINT	0	-128 to +127 (0 - 255)
Status	SINT	0	
TX FIFO Overflow	BIT 0		**0=No Error** 1=TX FIFO Overflow Error
RX FIFO Overflow	BIT 1		**0=No Error** 1=RX FIFO Overflow Error
RX Parity Error	BIT 2		**0=No Error** 1=RX Parity Overflow Error
Handshake Error	BIT 6		**0=No Error** 1=Handshake Error
New Data Flag	BIT 7		**0=No New Data** 1=New Data Present
Length_Lo	SINT	20	-128 to +127 (0 - 128)
Length_Hi	SINT	0	0 or 1
Data[128]	SINT	0	Received ASCII Message

Output Data	Data Type	Default Value	Valid Data Values
Transmit Record Number	SINT	0	-128 to +127 (0 - 255)
Receive Record Number	SINT	0	-128 to +127 (0 - 255)
Status	SINT	0	
TX FIFO Overflow	BIT 0		**0=No Error** 1=TX FIFO Overflow Error
RX FIFO Overflow	BIT 1		**0=No Error** 1=RX FIFO Overflow Error
RX Parity Error	BIT 2		**0=No Error** 1=RX Parity Overflow Error
Handshake Error	BIT 6		**0=No Error** 1=Handshake Error
New Data Flag	BIT 7		**0=No New Data** 1=New Data Present
Length_Lo	SINT	20	-128 to +127 (0 - 128)
Length_Hi	SINT	0	0 or 1
Data[128]	SINT	0	Transmitted ASCII Message

Transmit Record Number/ Receive Record Number / Length_Lo Note:

Note that “7 data bits” allows Transmit / Receive record Number of Length_Lo values of 0 - 127, which RSLogix 5000 does support in the signed Short Integer data type SINT (-128 to +127 range).

Note that “8 data bits” allows Transmit / Receive record Number of Length_Lo values of 0 - 255.

To enter values from +128 to +255, use this conversion formula:

> Desired Decimal Value - 256 = Entered Decimal Value.
> Example: For a Transmit / Receive record Number of Length_Lo value of 128, 128 - 256 = -128

Notes:

1734-AENT Quick Start

What's In This Appendix?

In this quick start, you will learn how to use the 1734-AENT with a ControlLogix processor for EtherNet/IP.

IMPORTANT This quick start contains a simple set of steps and reminders that will help you avoid errors when you are configuring your POINT I/O system for EtherNet/IP.

ATTENTION

You must use Series C POINT I/O modules with the 1734-AENT adapter. Series A or B POINT I/O modules will not work with this adapter.

Necessary Pre-requisites

Before you began this quick start, make sure the following conditions are in place.

- The ControlLogix Controller and the RSLogix software version must be version 11 or higher.
- The 1756-ENBT module must be version 2.3 or higher.
- The 1734 POINT I/O modules must be Series C (except for the 1734-232ASC modules, which can be Series A).
- The recommended RPIs are being used: Discrete = 10 ms or higher, Analog and Specialty = 50 ms or higher.
- The 1734-AENT POINT I/O adapter is a child to a local 1756-ENBT module.

Configure the 1734-AENT POINT I/O Adapter

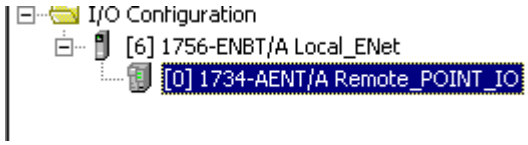
In the 1734-AENT's module Properties window, perform the following steps.

1. Complete the **Name** field.
2. Enter the following address into the **IP Address** field: **192.168.1.42**, (you will only be setting the last digit, because the first three digits are set for you) as set by the push wheel switches on the adapter. (**Note:** The push wheel switches should be set to 042.)
3. From the **Comm Format** menu, choose **None** (If you do **not** want a rack optimized connection or choose **Rack Optimization** if you want a rack optimized connection).
4. For the **Electronic Keying** field select **Compatible Module**.
5. Enter the **Chassis Size.**

Note: Regarding chassis size, the POINT I/O adapter itself takes up a count in the chassis. The default chassis size for the POINT I/O is 1, which covers the adapter only and allows for no I/O. Therefore, in order to configure your PointBus modules, you must set the chassis size to the physical amount of your I/O modules plus one for the adapter, otherwise you will get an error (i.e., if you have six modules in the chassis, chassis size has to be set to 6+1=7.)

6. Enter the **Slot**. For the adapter itself, the slot number is always 0 and cannot be modified.
7. Click on **Finish**.

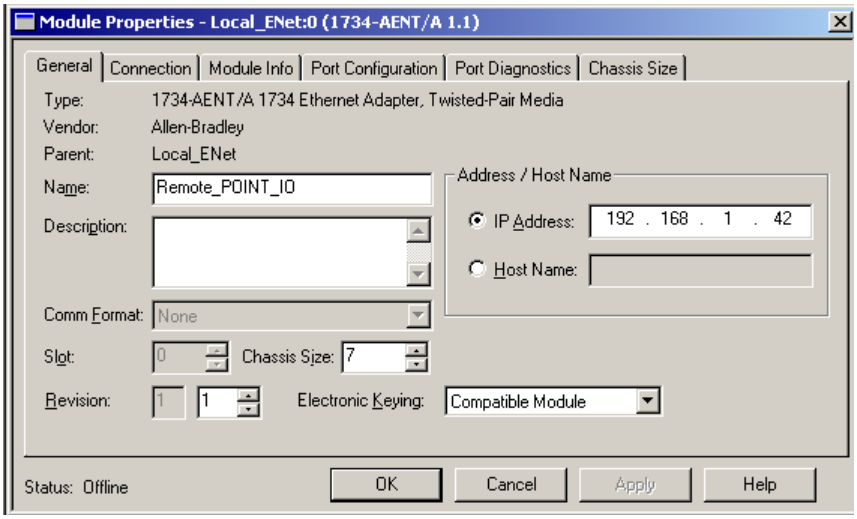
Your I/O Configuration tree now looks similar to the following:



Enter Adapter Properties

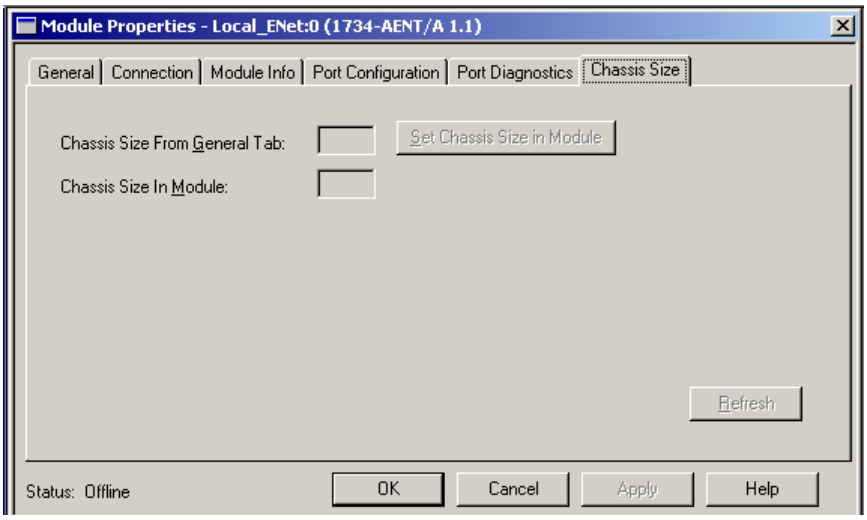
1. Right click on the 1734-AENT adapter and select **Properties**.

   The following window displays:



2. Click on the **Chassis Size** tab.

   You will notice that the data under this tab is grayed out while offline. The **Chassis Size** tab is used to send the module size from the **General** tab to the module itself once you are online. Otherwise, you will get an error. We will explore this later. For now, click on **OK** to close this window:



3. Right click on the POINT I/O adapter under I/O Configuration to add a new module.

4. Select the module from the list and click on **OK**.

5. In the **Module Properties** window, enter the following information:
   a. **Name**
   b. **Slot**
   c. **Comm Format**
   d. **Electronic Keying**, choose **Compatible Module** to verify the major revision. C, because only Series C modules support EtherNet/IP.
   e. Click on **Next** on the bottom of the window.
   f. Set the **RPI** to **10** ms for discrete and **50** ms for analog or specialty.

6. Click on **Finish**.

Add Another Module Under the Adapter

1. Right click on the POINT I/O adapter under I/O configuration to add a new module.

   Your second module is in **slot 2**.

2. Select the module from the **Module Type** list and click on **OK**.

3. In the **Module Properties** window, enter the following information:
   a. **Name**
   b. **Slot**
   c. **Comm Format**
   d. **Electronic Keying**, choose **Compatible Module**.
   e. Click on **Next**.
   f. Set the **RPI** to **10** ms for discrete and **50** ms for analog or specialty.

4. Click on **Finish**.

   Continue to add modules to the adapter in this fashion until all of the POINT I/O modules connected to the 1734-AENT have been added to the I/O Configuration tree.

Configure 1734 POINT I/O Modules

You should configure your 1734 POINT I/O modules via the Controller Tags database. To do this, following the steps below.

1. Double click on the Controller Tags in the project window.

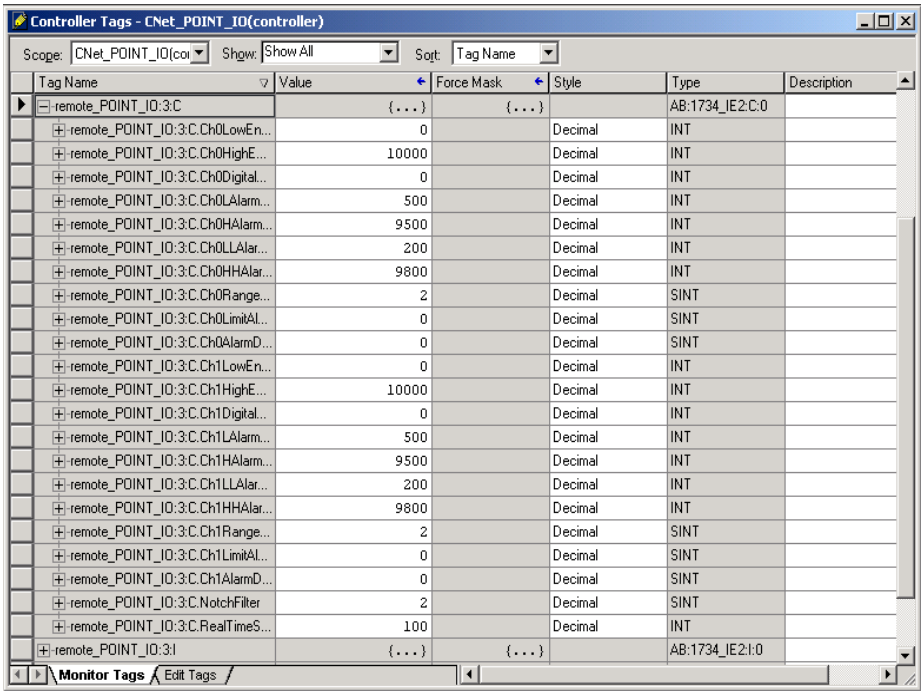
   Look at the bottom of the screen to make sure you are in the **Monitor Tags** tab.

2. Click on the module you would like to configure.

We are going to assume there is an analog input module 1734-IE2V, which resides in slot 3.

3. Click on the configuration tag **remote_POINT_IO:3:C**.

   From here you can set the entire module's configuration, alarms, etc.



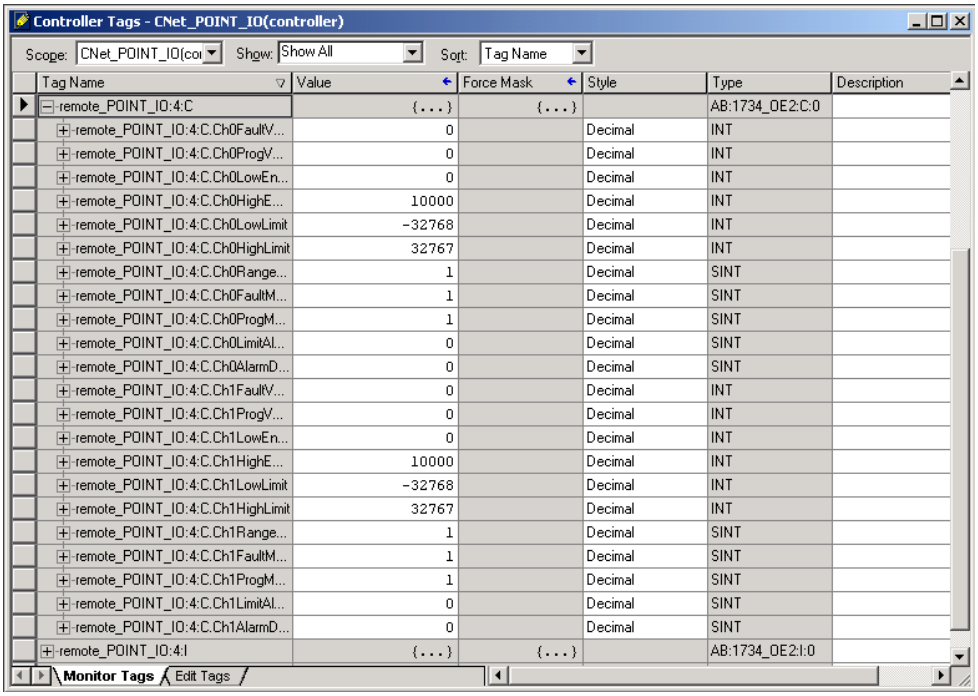
   In this configuration window, you enter the values that would correspond to the desired range. According to Appendix C of this user manual, the range type default value for a 1734-IE2V module is **2**, which is equal to **0-10VDC**.

4. Click on the configuration tag for the module in slot 4, **remote_POINT_IO:4:C**.

5. Check the value in the tag **remote_POINT_IO:4:C.Ch0RangeType**.

It is set to 1, which is one of the default values. If you look to Appendix C of this user manual, you will see that there are two settings that this module will support:

- 1 = 0 to 10VDC
- 3 = -10 to +10VDC



Please note the following:

- The controller only sends the configuration data when connection is being established.
- Should you need to modify any of the tag values once you change the tag, you will need to access the updated information and download it into the module. There are three ways to download the updated configuration information into the module.

– Ideally, you would enter the correct code number in the **Range Type** field at the same time that you add the I/O to the I/O Configuration tree. You would then download later.

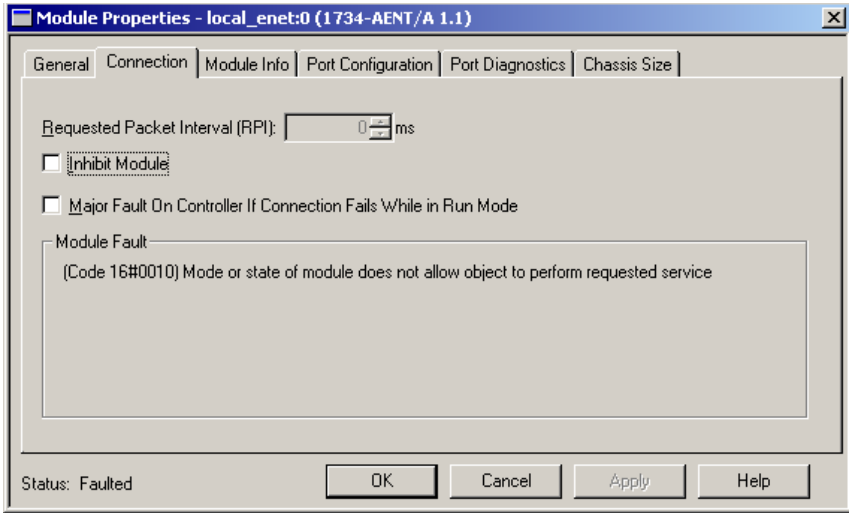
– However, if you have downloaded the offline configuration into the module and then realize that you must modify any of the module's configuration parameters, then the preferred way to make these changes online is to go to the **Module Connection** tab and inhibit the module, apply the changes, and then uninhibit the module. Doing this will break the connection, causing the configuration information to be downloaded right after the connection is made.

IMPORTANT Switching the processor from Program to Run mode does not change the module connection status and does not re-send module configuration data!

It is highly recommended that the inhibit/uninhibit process be used and that power cycling be avoided.

6. Right click on the 1734-AENT adapter and select **Properties**.

7. Click on **Connection Tab**. You will see the following message:



The module is faulted because even though you have set up the 1734-AENT's POINT I/O chassis size to the actual number of the modules plus the adapter, the adapter still remembers the size of **1** (the factory default value) until you go and reset this size manually. This option is available only online.

8. Click on the **Chassis Size** tab.

9. Click on the **Set Chassis Size in Module** button and set the chassis size in the adapter. (Remember to inhibit and unhibit the module for this to take effect.)

Now you can put your processor in Run mode and the connection should be successful.

IMPORTANT The information found in the Appendix C of this user manual is also available in the RSLogix 5000 on-line help file. Use the Help file search function under the 1734 catalog number that you are configuring and select the **Module Defined Data Types** option. All of the configurable parameters and associated values will display. Under the **Valid Data Values** column in Appendix C of this manual, where the parameter values are coding their definitions will be listed and identified.

Configure an Ethernet Driver in RSLinx

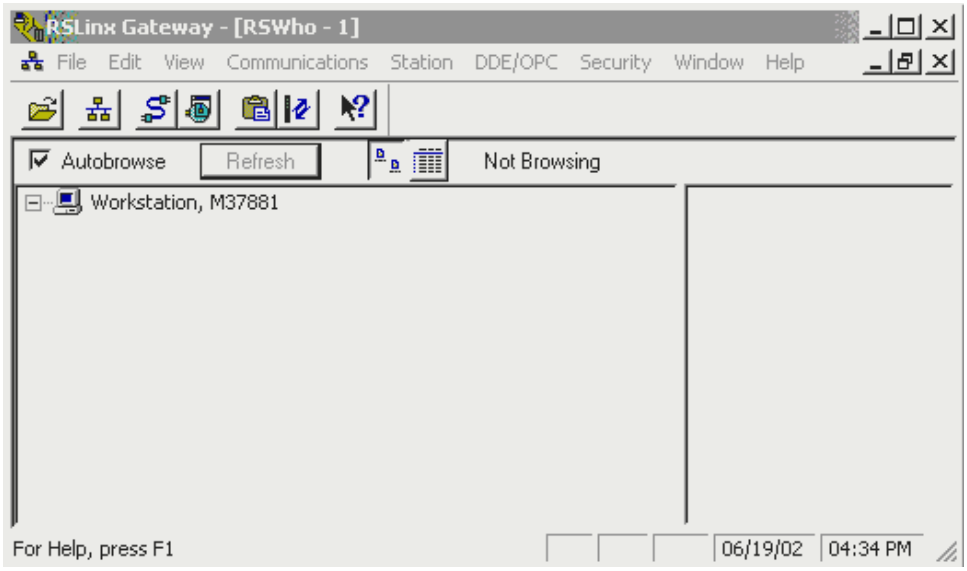
To configure an Ethernet driver in RSLinx, you must launch RSLinx software.

Launch RSLinx Software

Launching the RSLinx software will enable you to configure the driver you will use to communicate with the a ControlLogix processor.

1. Double click on the **RSLinx** icon on the Desktop to launch RSLinx software.
2. Click on the **RSWho** icon  .

The Rockwell Software RSLinx Gateway - [RSWho - 1] screen appears.



TIP

The RSWho screen is actually RSLinx's network browser interface, which lets you view all of your active network connections.

The left pane of this display is the Tree Control, which shows networks and devices in a hierarchical view. When a network or device is collapsed, as indicated by the + sign, you can click on the + sign or double click on the network or device icon to expand the view and begin browsing. When a network or device is expanded, as indicated by the - sign, you can click on the - sign or double click on the network or device icon to collapse the view. The right pane of the RSWho display is the List Control, which is a graphical representation of all of the devices present on the network.

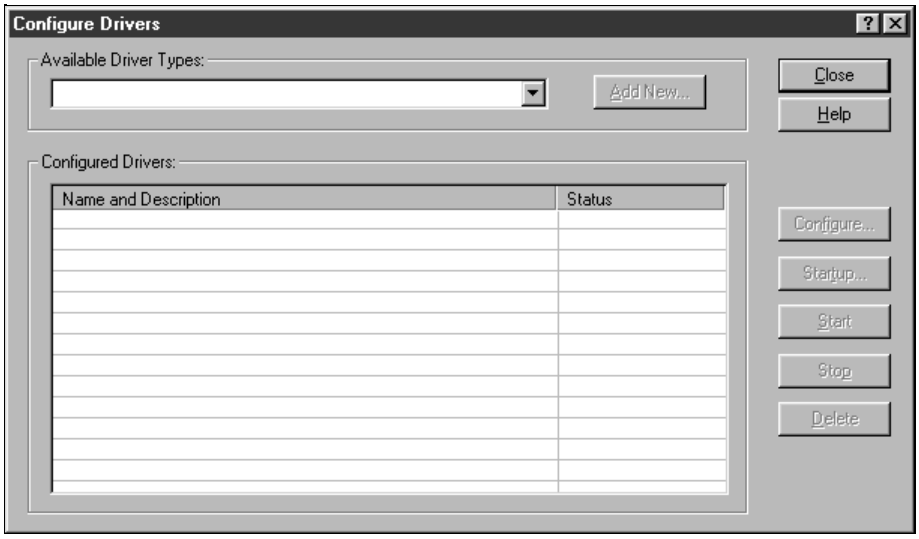
TIP

If there is a communication status error with a device (e.g., when a recognized device is inadvertently unplugged), that device appears with a red X, indicating that RSWho previously recognized it, but now it can not. You can choose to remove the device from the RSWho display, or you can choose to correct the communication error.

Adding the AB_ETHIP-1 (EtherNet/IP) Driver

1. From the **Communications** menu, choose **Configure Drivers**.

   The Configure Drivers dialog appears.



2. From the **Available Driver Types** pull-down menu, choose **EtherNet/IP Driver**.

3. Click on the **Add New** button.

4. Click on **OK** to accept the default name (AB_ETHIP-1).

5. Ensure that the radio button for **Browse Local Subnet** is enabled.

6. Click on **OK**.

7. Verify that the driver you just configured is running and click on the **Close** button to exit the **Configure Drivers** window.

8. Click on the **X** in the upper right corner of the RSWho window to stop RSWho.

9. Click on the minimize icon in the upper right corner of the RSLinx window to minimize RSLinx.

Numbers

A

B

C

S

T

W

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