EtherNet/IP In-cabinet System

Catalog Numbers 100-E-INT, 100-E-INT-D, 100-E-INT-X, 104-E-INT-D, 104-E-INT-X, 800F-INT, 800F-INT-L, 1486-CBL-10M, 1486-CBL-25M, 1486-CBL-100M, 1486-CON-D1, 1486-CON-P1, 1486-CON-P2L, 1486-CON-P2R, 1486-CON-S1, 1486-CON-T1, and 1834-AENTR

Allen-Bradley
by ROCKWELL AUTOMATION

User Manual

Original Instructions

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

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

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

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. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

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

These labels may also be on or inside the equipment to provide specific precautions.

SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

The following icon may appear in the text of this document.

Identifies information that is useful and can help to make a process easier to do or easier to understand.

Notes:

About This Publication

This user manual provides detailed information to install, use, and troubleshoot the EtherNet/IP In-cabinet system.

Download Firmware, AOP, EDS, and Other Files

Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Certifications

For a complete list of certifications, visit our Product Certifications website, rok.auto/certifications and use '1834-CT' as your search term.

Some devices depicted in this manual are not currently for sale, but once released will have appropriate certifications.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
EtherNet/IP In-cabinet System Technical Data, publication 1834-TD001	Provides technical data for the EtherNet/IP In-cabinet system.
EtherNet/IP In-cabinet Gateway Product Information, publication 1834-PC001	Provides installation instructions for the 1834-AENTR Ethernet In-cabinet gateway.
EtherNet/IP In-cabinet 100E and 104-E Communication Interfaces Product Information, publication 1834-PC003	Provides installation instructions for the 100E-INT, 100-E-INT-D, 100-E-INT-X, 104-E-INT-D, and 104-E-INT-X communication interfaces.
EtherNet/IP In-cabinet 800F Communication Interface Module Product Information, publication 1834-PC004	Provides installation instructions for the 800F communication interface.
EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001	Provides I/O detail for EtherNet In-cabinet system.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication IC-AT001	Provides an overview of American motor circuit design based on methods that are outlined in the NEC.
CIP™ Security with Rockwell Automation Products, publication SECURE-AT001	Explanation of how to implement the Common Industrial Protocol (CIP) Security standard in your industrial automation control system (IACS).
FactoryTalk Security Application Technique, publication SECURE-AT002	Describes how to use FactoryTalk® Security to implement authentication and authorization in your industrial automation system and enforce product-specific security for Studio 5000 Logix Designer®, FactoryTalk View, and FactoryTalk AssetCentre.
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
Configure System Security Features User Manual, publication SECURE-UM001	Describes how to configure and use Rockwell Automation products to improve the security of your industrial automation system.
Converged Plantwide Ethernet Design and Implementation Guide, publication ENET-TD001	Provides Converged Plantwide Ethernet (CPwE) guidelines to design, implement, and manage industrial Ethernet networks.
Deploying 802.11 Wireless LAN Technology within a Converged Plantwide Ethernet Architecture Design and Implementation Guide, publication ENET-TD006	Builds on an existing CPwE system by introducing wireless local area network (LAN) capabilities, with emphasis on equipment connectivity.
Deploying CIP Security within a Converged Plantwide Ethernet Architecture Design Guide, publication ENET-TD022	Provides a comprehensive explanation of the CIP Security application design.
Deploying Identity and Mobility Services within a Converged Plantwide Ethernet Architecture Design and Implementation Guide, publication ENET-TD008	Provides an overview and design considerations for CPwE architecture design identity and mobility services.
E100 Electronic Overload Relay Specifications, publication 193-TD013	Provides technical data for Bulletin Number 193 E100 electronic overload relays.
Ethernet Reference Manual, publication ENET-RM002	References EtherNet/IP devices to communicate on the EtherNet/IP network.
EtherNet/IP Network Devices User Manual, publication ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
FactoryTalk Policy Manager Getting Results Guide, publication FTALK-GR001	Provides information on installing and using FactoryTalk System Services and FactoryTalk Policy Manager.
IEC 22 mm Push Button Specifications, publication 800-TD008	Provides technical data for Bulletin Numbers: Bulletin Numbers 598, 800B, 800F, 800FC, 800FD, 800MB, and 800MR.
IEC Contactor Specifications, publication 100-TD013	Provides technical data for Bulletin Numbers: 100/104-K, 100/104-C, 100/104S-C, 100/104-E, and 100S-E.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.

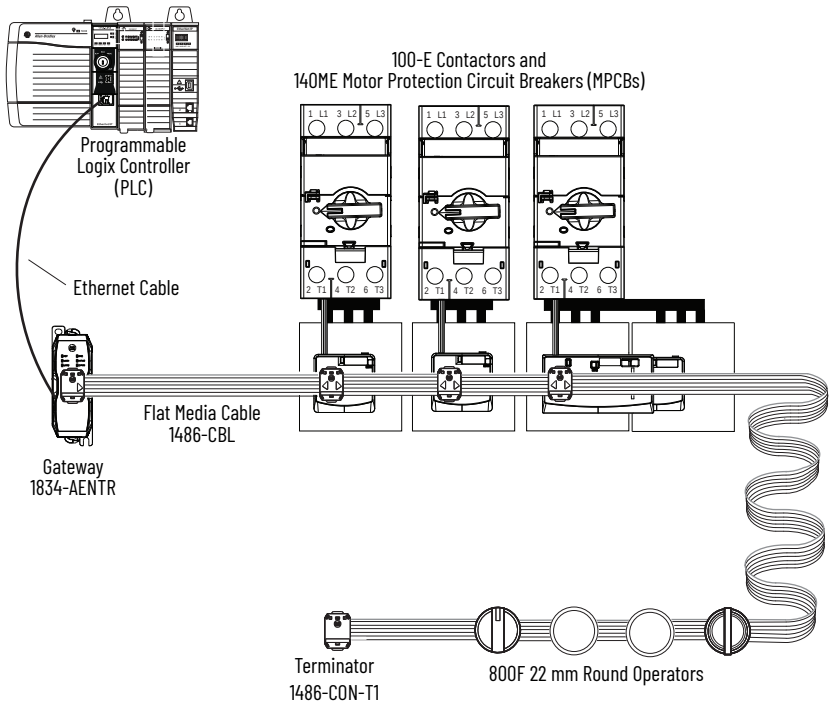
Resource	Description
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Logix 5000 Controllers Security Programming Manual, publication 1756-PM016	Explains how to configure security for the Logix Designer™ application and explains how to set up source protection for logic and projects.
Logix 5000 Controller and I/O Fault Codes and Syslog Messages Reference Data, publication 1756-RD001	Provides a list of Logix 5000 Controller and I/O Fault Codes and corresponding corrective actions.
Motor Protection Circuit Breaker and Motor Circuit Protector Specifications, publication 140M-TD002	Provides technical data for Bulletin Number 140M Motor Protection Circuit Breakers (MPCBs) and Motor Circuit Protectors (MCPs).
Motor Protection Circuit Breaker and Motor Circuit Protector Specifications, publication 140-TD005	Provides technical data for Bulletin Numbers 140MP, 140MT, and 140M MCPBs and MCPs.
NIST Digital Identity Guidelines Special Publication 800-63B, publication 800-63B	Provide technical guidelines for the National Institute of Standards and Technology (NIST) for the implementation of digital authentication.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication SGI-1.1	Designed to harmonize with National Electrical Manufacturers Association (NEMA) Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Site-to-Site VPN to a Converged Plantwide Ethernet Architecture Design and Implementation Guide, publication ENET-TD012	Highlights the key International Association of Classification Societies (IACS) application requirements, technology, and supporting design considerations to help with the successful design and deployment of these specific use cases within the framework of CPwE
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories (UL).
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.
Product Compatibility and Download Center (PCDC), rok.auto/pcdc	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.

Overview

The EtherNet/IP In-cabinet system is an In-cabinet technology that provides a secure infrastructure to access identity, state, runtime, and maintenance information from devices in the control panel. This EtherNet/IP In-cabinet system eliminates control wiring, reduces panel space requirements, and reduces commissioning efforts.

An EtherNet/IP In-cabinet system is a linear flat media network with up to 25 meters (82 feet) connectivity and 40 connected nodes. A single flat media network cable incorporates both device power bus (NP) for communications along with a switched power bus (SP) for powering larger loads such as electronic coils.

Example: EtherNet/IP In-cabinet System



Supported Devices

The EtherNet/IP In-cabinet system consists of the following supported devices:

- 1834-AENTR EtherNet/IP gateway
- 1486-CON-x flat media connectors to connect communication interfaces and devices to the system
- 1486-CBL flat media cable to connect all system components
- 800F, 100-E, and 104-E communication interface modules

The individual supported devices on the EtherNet/IP In-cabinet system bus appear as devices in the controller organizer of the controller project and automatically-generated I/O tags.

1834-AENTR Gateway

The 1834-AENTR gateway is the primary EtherNet/IP In-cabinet network power source. It connects the devices on the EtherNet/IP In-cabinet bus to a standard EtherNet/IP network to allow communication between a Logix controller and the devices.

Features include:

- Dual RJ45 ports for Device Level Ring (DLR) connection, Dynamic Host Configuration Protocol (DHCP), or rotary switch to set the IP address
- One EtherNet/IP In-cabinet 1486-CBL flat media cable connection
- Auto-IP commissioning of connected devices
- Configuration using Logix Designer/Studio 5000®
- Maximum of 40 node connections (includes 1834-AENTR gateway)
- Maximum of 25 m (82 ft) flat media cable per 1834-AENTR gateway
- Implicit protection mode and explicit protection mode support (see Protection Modes on page 13 for more information)

100-E and 104-E Contactor Communication Interface Modules

100-E and 104-E contactor communication interface modules are standard supported devices for your EtherNet/IP In-cabinet system. These contactor communication interface modules for 100-E and 104-E contactors enhance electrical control and switching.

Cat. No.	Description		Usage
100-E-INT		Non-reversing simple contactor coil control	Contactor only application 3-phase voltage control, non-motor loads Use only when general purpose relay settings are exceeded, system enable or master control upstream/downstream system interlocking
100-E-INT-D		Non-reversing simple contactor coil control **plus** discrete input for interlocking	2-component motor starter or 3-component motor starter connecting the discrete input to a trip contact/ condition from a connected overload relay or motor protection circuit breaker (MPCB) Other applications as contactor only with interlock (similar to 100-E-INT)
104-E-INT-D		Reversing simple contactor coil control **plus** discrete input for interlocking	
100-E-INT-X		Non-reversing simple contactor coil control with discrete input for interlocking **plus** data port communications	2-component motor starter or 3-component motor starter (similar to 100E-INT-D and 104-E-INT-D) with added data communication port connection to a 140ME Motor Connection Circuit Breaker (MCCB), or a E100 solid-state motor overload relay
104-E-INT-X		Reversing simple contactor coil control with discrete input for interlocking **plus** data port communications	

800F Communication Interface Modules for 800F Operators

800F communication interface modules enhance 800F In-cabinet input devices for electrical control and switching. 800F communication interface modules, available as non-illuminated or illuminated, can be snap-fit to 800F-ALP and 800F-ALM latches.

Cat. No.	Description	
800F-INT		Non-illuminated communication interface module For non-illuminated 22 mm push buttons Use to internally monitor the state of the 800F operators
800F-INT-L		Illuminated communication interface module For illuminated 22 mm push buttons and pilot lights Use with 800F pilot lights to internally monitor the state of the 800F operators

Operating Mode

When you configure a device in an EtherNet/IP In-cabinet system, you define whether the device is managed by (receives input data from) a controller or peer. If the device is managed by a:

- controller, the controller manages the connection to the device.
- peer, another device in the system manages the connection to the device without input from the connected controller.

Hand/Off/Auto (HOA) devices support a mixed mode where you can change control between a controller or peer. You can configure as many as seven peer control commands per device. You define peer command triggers and actions on the Peer Command view of the device's 'Module Properties'.

100-E and 104-E Contactor Modes

The 100-E and 104-E contactors operate as follows, depending on the 'Controlled By' option.

Starter Modes Depending on the Controlled-by Option

Controlled By	Supported Peer Commands	100-E-INT	100-E-INT-D	104-E-INT-D
Controller	None	✓	✓	✓
Controller/peer 2-wire	Hand	✓	✓	✓
	Off			
	Auto			
	Run Forward	–	–	✓
	Run Reverse	–	–	✓
Controller/peer 3-wire	Hand	✓	✓	✓
	Off			
	Auto			
	Run	✓	–	–
	Run Forward	–	✓	✓
	Run Reverse	–	–	✓
	Stop	✓	✓	✓
Peer 2-wire	Run	✓	–	–
	Run Forward	–	✓	✓
	Run Reverse	–	–	✓

Starter Modes Depending on the Controlled-by Option (Continued)

Controlled By	Supported Peer Commands	100-E-INT	100-E-INT-D	104-E-INT-D
Peer 3-wire	Run	✓	–	–
	Run Forward	–	✓	✓
	Run Reverse	–	–	✓
	Stop	✓	✓	✓

Illuminated 800F Push Button Modes

The illuminated 800F operators feature various modes that can be managed by the controller or a peer device.

Mode	Options
Light color	Red
	Green
	White
	Blue
	Yellow
	Turquoise
	Magenta
	Amber
Light state	Illumination off
	Illumination on
	Blink
	Dim
	Blink and dim
Trigger condition	All selected states are true
	One or more of the source states are true (default)
	None of the selected source states are true

Device Level Ring Network

Device Level Ring (DLR) is an EtherNet/IP protocol that is defined by ODVA® Inc. DLR provides a means to detect, manage, and recover from single faults in a ring-based network.

A DLR network includes the ring nodes types listed in the table below.

DLR Network Ring Node	Description
Ring supervisor	A ring supervisor provides these functions: • Manages traffic on the DLR network • Collects diagnostic information for the network A DLR network requires at least one node to be configured as ring supervisor. By default, the DLR supervisor function is disabled on supervisor-capable devices.
Ring participants	Ring participants provide these functions: • Process data that is transmitted over the network • Pass on the data to the next node on the network • Report fault locations to the active ring supervisor When a fault occurs on the DLR network, ring participants reconfigure themselves and relearn the network topology.
Redundant gateways (optional)	Redundant gateways: • are multiple switches that are connected to one DLR network and also connected together through the rest of the network. • provide DLR network resiliency to the rest of the network.

Depending on their firmware capabilities, both devices and switches can operate as supervisors or ring nodes on a DLR network. Only switches can operate as redundant gateways. The 1834-AENTR gateway can only operate as a ring participant.

For more information about DLR, see the EtherNet/IP Device Level Ring Application Technique, publication ENET-AT007.

Protection Modes

There are two protection mode types available, implicit protection mode and explicit protection mode.

Implicit Protection Mode

Available for all EtherNet/IP In-cabinet system supported devices including the 1834-AENTR gateway, the implicit protection mode is a state where the device is operational, but has implemented defenses against disruptive changes that would take the product out of service for the process.

Explicit Protection Mode

Available for the 1834-AENTR gateway only, the explicit protection mode rejects any Common Industrial Protocol (CIP) explicit messages that would change the configuration of the module. For example, you cannot change the IP address, speed, or duplex settings when the module has explicit protection mode enabled.

For more information and instruction to enable and disable these protection modes, see Protection Modes on page 71.

Security Considerations

To help maintain a secure system, follow these guidelines:

- Limit physical access to authorized personnel only.
- Implement physical barriers such as locked cabinets.
- Only purchase products from official suppliers.
- Only download firmware and software from the official download portal at rok.auto/pcdc.

To secure networks and communication data, follow these guidelines:

- Implement network technologies that filter, block, and control access to help secure networks.
- Configure authorization policies to define conditions for remote access.
- Select control products that offer security options.

For more information on security considerations, see the following publications:

Resource	Description
System Security Design Guidelines Reference Manual, publication SECURE-RM001	Provides guidance to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
Configure System Security Features User Manual, publication SECURE-UM001	Describes how to configure and use Rockwell Automation products to improve the security of your industrial automation system.
CIP Security with Rockwell Automation Products, publication SECURE-AT001	Describes how to plan and implement a Rockwell Automation system that supports CIP Security protocol.
FactoryTalk Security Application Technique, publication SECURE-AT002	Describes how to use FactoryTalk Security to implement authentication and authorization in your industrial automation system and enforce product-specific security for Studio 5000 Logix Designer, FactoryTalk View, and FactoryTalk AssetCentre.
Converged Plantwide Ethernet Design and Implementation Guide, publication ENET-TD001	Provides guidelines for how to design, implement, and manage industrial Ethernet networks.

Common Industrial Protocol Security

For information on Common Industrial Protocol (CIP) Security, see CIP Security on page 67.

Electronic Keying

Electronic keying reduces the possibility that you use the wrong device in a control system. It compares the device defined in your project to the installed device. If electronic keying fails, a fault occurs. These attributes are compared in the table below.

Attribute	Description
Vendor	The device manufacturer.
Device type	The general type of the product, for example, digital I/O module.
Product code	The specific type of the product. The Product Code maps to a catalog number.
Major revision	A number that represents the functional capabilities of a device.
Minor revision	A number that represents behavior changes in the device.

For more detailed information on electronic keying, see Electronic Keying in Logix5000 Control Systems Application Technique, publication LOGIX-AT001.

IMPORTANT

- Carefully consider the implications of each of the following electronic keying options shown in the table below.
- Changing electronic keying parameters online interrupts connections to the device and any devices that are connected through the device.
- Connections from other controllers can also be interrupted. If an I/O connection to a device is interrupted, a loss of data can occur.

ATTENTION: It is **strongly recommend** that you **do not use** the **disable keying** option. If the disable keying option must be used, proceed with extreme caution and take full responsibility for understanding whether the device being used can fulfill the functional requirements of the application.

Available Electronic Keying Options

Electronic Keying Option	Description
Compatible module	Lets the installed device accept the key of the device that is defined in the project when the installed device can emulate the defined device. With Compatible Module, you can typically replace a device with another device that has the following characteristics: • Same catalog number • Same or higher major revision • Minor revision – If the major revision is the same, the minor revision must be the same or higher. – If the major revision is higher, the minor revision can be any number.
Disable keying	Indicates that the keying attributes are not considered when attempting to communicate with a device. With 'Disable Keying', communication can occur with a device other than the type specified in the project.
Exact match	Indicates that all keying attributes must match to establish communication. If any attribute does not precisely match, communication with the device does not occur.

Plan a Local Network (Bus) Architecture

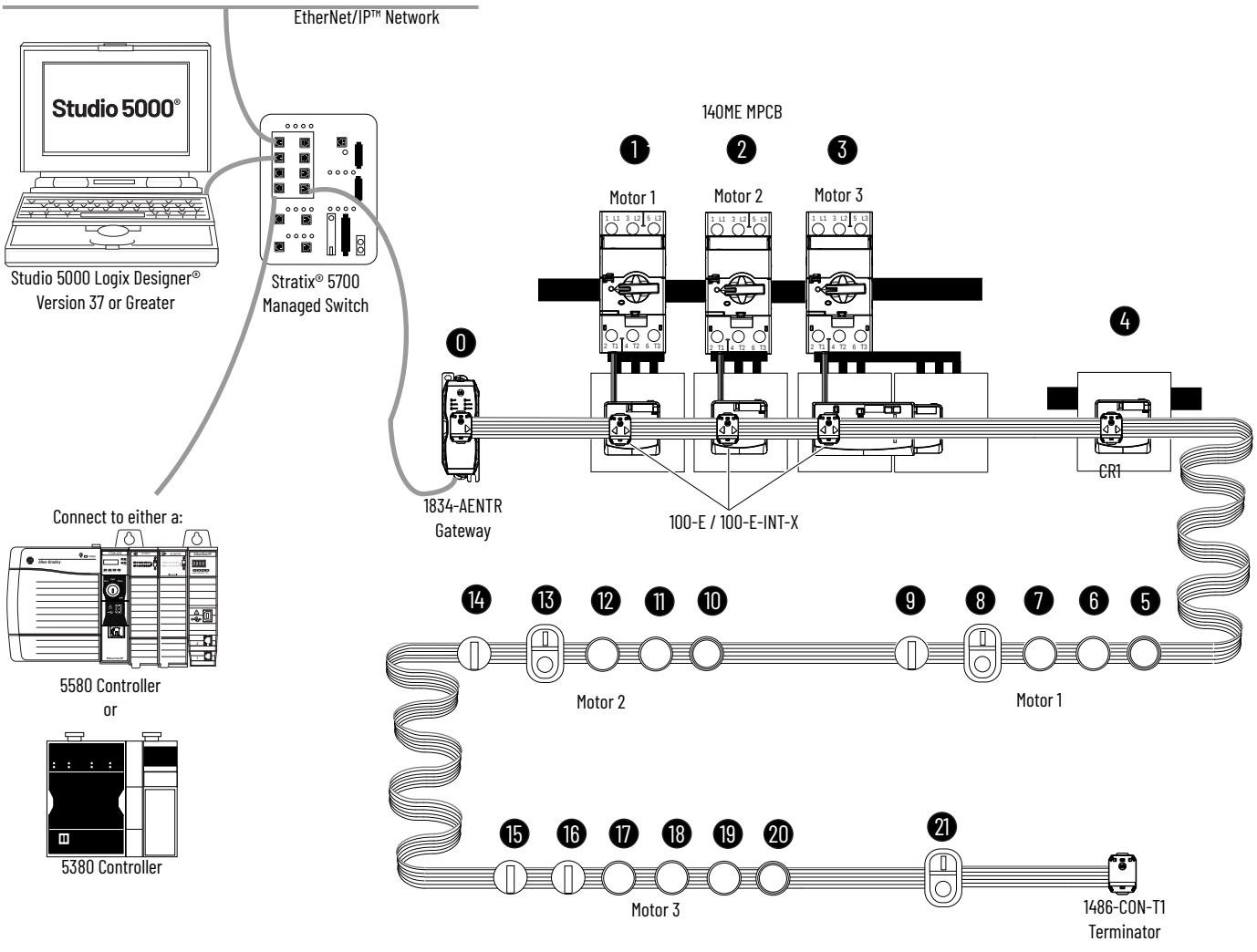
Size the Bus

The local network bus supports one 1834-AENTR gateway and as many as 39 additional devices. Follow these guidelines as you plan a bus:

- Each end of the bus must be terminated. The 1834-AENTR gateway provides internal termination.
- The minimum separation between connectors is 50 mm (1.97 in), but a 100 mm (3.94 in) or larger separation between connectors is recommended.
- The maximum network distance from the 1834-AENTR gateway connection to the 1486-CON-T1 terminator connection is 25 m (82 ft).

The figure below provides an example layout of a 1834-AENTR gateway with supported devices where position 0 is the 1834-AENTR gateway, position 1...21 are the supported devices, and position 22 is the 1486-CON-T1 terminator.

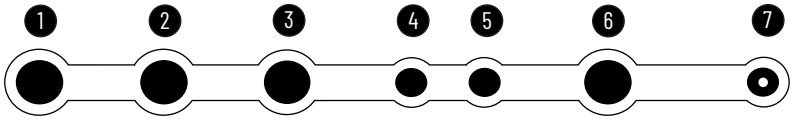
Example of Gateway and Supported Devices



1486-CBL Flat Media Cable

The 1486-CBL flat media cable is a multi-conductor cable that passes power and signal to and from communication interface devices in a multi-drop bus topology.

All the end nodes in the EtherNet/IP In-cabinet system are connected to this 1486-CBL single flat media cable. The figure and table below describe its construction.

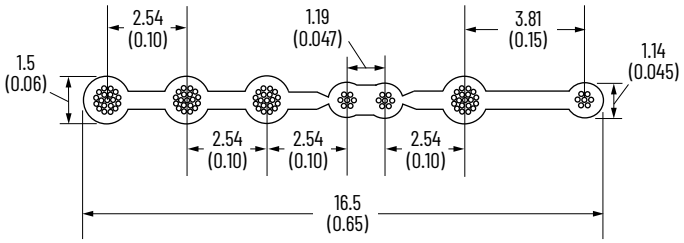


Side View

Note No.	Description	
1	Switched Power (SP-)	Coil control
2	Switched Power (SP+)	Coil control
3	Network Power (NP+)	Interface power
4	Single Pair Ethernet (SPE+)	Communications
5	Single Pair Ethernet (SPE-)	Communications
6	Network Power (NP-)	Interface power
7	Select Line	Device position on media

The 1486-CBL flat media cable is available in 10 m (32.8 ft), 25 m (82 ft) and 100 m (328 ft) lengths.

The figure below shows the approximate dimensions of the 1486-CBL flat media cable. Approximate dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



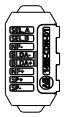
Side View

1486-CON Connectors

The bus uses 1486-CON connectors to attach system components to the 1486-CBL flat media cable.

- 1486-CON connectors cannot be added to or removed from an active system.
- Any unpopulated connector must be capped with a 1486-CON-D1 connector cover.
- Only one device can be removed at a time.

The table below shows available 1486-CON connectors available for your EtherNet/IP In-cabinet system.

Cat. No.	Connector	Description	For Use with	Connector Supplied with Cat. No.
1486-CON-D1		Connector cover with test access points	1486-CON-P1 connectors installed on the cable which are unused or unplugged	–
1486-CON-P1		Connector, straight through	100-E, 104-E, 800F communication interfaces	100-E-INT, 100-E-INT-D, 100E-INT-X, 104-E-INT-D, 104-E-INT-X, 800F-INT, 800F-INT-L
1486-CON-P2L		Connector, covers left end of cable	1834-AENTR gateway and 1834-SUP-PWR supplemental power tap	1834-AENTR, 1834-SUP-PWR
1486-CON-P2R		Connector, covers right end of cable	1834-AENTR gateway and 1834-SUP-PWR supplemental power tap	1834-SUP-PWR
1486-CON-S1		Connector, joins two cables	Extending or repairing cable	–
1486-CON-T1		Connector, media termination	End of bus/cable	1834-AENTR

Power Consumption

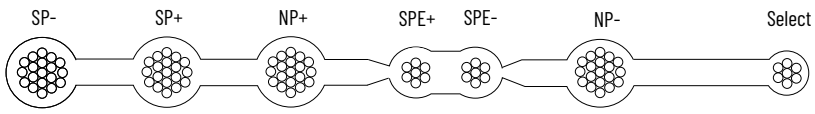
The 1834-AENTR gateway produces two output channels of available power to source the connected flat media network, Network Power (NP) and Switched Power (SP) outputs. Both of these outputs have the ampacity to provide 4 amps continuous, maximum. Additionally, the SP channel can provide a boost capacity of 8 amps. This intermittent operation can accommodate inrush current required to energize contactor coils connected to the 1486-CBL flat media cable.

Output Channel	Requirement
Network Power (NP)	Required for each network communication interface connected on the flat media cable system.
Switched Power (SP)	Required for each 100-E and 104-E EtherNet/IP In-cabinet communication interface connected within a flat media system. SP is used to energize the 100-E and 104-E electronic coils.

Power Specifications

The bus media has four lines for network power and switched power.

- 20 AWG wires (19 strands) for NP-, NP+, SP+, SP-
- 4 A current for NP-, NP+, SP+, and SP-



Calculating the Network Power Ampacity

Each of the communication interfaces (800F, 100/104-E) consume approximately 50 mA of continuous network power (NP). This loading calculation must be accounted for in the total 24V DC input source capacity to the 1834-AENTR gateway.

When calculating NP power consumption for your EtherNet/IP In-cabinet system, consider the following calculations:

- Each end node type requires 50 mA of continuous current to operate.
- For systems using all 40 node connections, plan for 2 amps.

Calculation

(Number of Network Connections x 50 mA) ÷ 1000 = Total amps (A) required for NP

Example Calculation

(40 nodes x 50 mA) ÷ 1000 = 2 A required for NP

Calculating the Switched Power Ampacity

When applying motor starters to your flat media network, your calculation must be accounted for in the total 24V DC input source capacity to the 1834-AENTR gateway. With the proper 10 amp source, the 1834-AENTR gateway can supply an 8 amp short-duration boost for switched power (SP).

IMPORTANT You must provide 96 W of "hold-in" energy and 196 W of peak supply to accommodate coil 'in-rush' energy when energizing contactor coils.

Consider the following factors when adding 100-E and/or 104-E AC contactors to your system:

- the number of contactors connected to each system,
- the coil type of each, and
- how many starters are simultaneously started.

Our Rockwell Automation family of 100-E and 104-E AC contactors offer multiple coil types. The EJ and QJ coils are low consumption and provide lower coil "in-rush" and coil "hold-in" ratings.

For a complete list of coil ratings, see IEC Contactor Technical Data, publication 100-TD013.

Example: Evaluation Method for SP Calculation

To determine the total demand requirement for SP, follow the instructions in the example below.

Example Calculation: Contactor Energy Consumption

Cat. No. Contactor Range	Coil Rating	Energy Consumption in Watts (W) by Consumption per Contactor		
		KJ (Standard)	EJ (Low)	QJ (Low, Fast Dropout)
100-E09...100-E38	Hold-in energy	2.2	1.7	1.7
	In-rush energy	50	16	6
100-E40...100-E65	Hold-in energy	2	–	–
	In-rush energy	25	–	–
100-E80...100-E96	Hold-in energy	2	–	–
	In-rush energy	40	–	–

1. Use the formulas below to calculate the total SP required and total in-rush required.

Calculation

(Number of Contactors x Hold-in Energy) = Total SP Required

(Number of Contactors x In-rush Energy) = Total In-rush Required

IMPORTANT The in-rush value can be derated if the motors are not started at the same time.

2. Use the calculated total values to validate the sizing of the DC power supply connected to the 1834-AENTR gateway.

IMPORTANT The DC supply must adequately manage both NP & SP power requirements of your flat media system.

Calculate Total Power Consumption of NP and SP

The EtherNet/IP In-cabinet system is assembled with 40 total connections. The 1834-AENTR gateway is connected to a 240W, 24V, 10 A DC power supply (such as Cat. No. 1606-XLE240E). The flat media system includes a total of 15 contactors (Cat. No. 100-E38) with QJ coil types.

The example below illustrates a calculation if all the motors are started simultaneously.

Example: Calculation Demands for the 1834-AENTR Gateway

The source power to the 1834-AENTR gateway will accommodate the following ampacities on the flat media system:

Example Calculation

(Number of Network Connections x 50 mA) ÷ 1000 = Total amps (A) required for NP

NP Requirement

(40 nodes x 50 mA) ÷ 1000 = 2 A required for NP

The remaining 8 A of capacity can provide 4 A (96 W) of continuous demand for 'hold-in' energy for electronic coils and an additional 4 A peak supply (196 W) for 'in-rush' energy when energizing coil loads. The 8 A total source provides the maximum available amps for a connected system.

Evaluate the Power Requirements of the Number of Contactors

Perform the following calculation to evaluate the number of 100-E contactors connected.

Example Calculation: Contactor Energy Consumption, QJ (Low, Fast Dropout)

Cat. No. Contactor Range	Coil Rating	Energy Consumption in Watts (W)
100-E38QJ00	Hold-in Energy	1.7
	In-rush Energy	6

1. Use the formulas below to evaluate the 'hold-in' and 'in-rush' energy the system requires.

Hold-In Energy Required			
	Calculation		Example
	Number of Contactors		15 quantity
x	Hold-in Energy Watts	x	1.7 W
	Total Hold-in Energy Required		25.5 W

In-rush Energy Required			
	Calculation		Example
	Number of Contactors		15 quantity
x	In-rush Energy Watts	x	6 W
	Total In-rush Energy Required		90 W

2. Use the formula below to calculate watts remaining based on the total required.

Hold-In Energy Required			
	Calculation		Example
	96 W Continuous Supply of 1836-AENTR Gateway		96 W
–	Total Hold-in Required	–	25.5 W
	Total Watts Remaining		70.5 W Remaining

In-rush Energy Required			
	Calculation		Example
	196 W Peak Supply of 1836-AENTR Gateway		196 W
–	Total Hold-in Required	–	90 W
	Total Watts Remaining		106 W Remaining

The system will operate as intended if:

- the total watts remaining is greater than 0 and
- the amount of hold-in and in-rush ampacities are below the maximums the system can provide.

Install System Components

Electrostatic Discharge Precautions

ATTENTION: This equipment is sensitive to electrostatic discharge (ESD), which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.
- Use only a soft dry anti-static cloth to wipe down exterior surfaces.
- Do not use any cleaning agents to clean the exterior surfaces.

Environment and Enclosure Information

ATTENTION: This product:

- is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.
- is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.
- is certified for use only within the surrounding air temperature range of -20...+60 °C (-4...+140 °F). The equipment must not be used outside of this range.
- is not resistant to sunlight or other sources of UV radiation.

ATTENTION: This product, supplied as open-type equipment, must be mounted:

- within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications. The enclosure must be accessible only by the use of a tool.
- in an UKEX/ATEX/IECEx/INMETRO Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (in accordance with EN/IEC/ABNT NBR 60079-0) and used in an environment of not more than Pollution Degree 2 (as defined in EN/IEC 60664-1) when applied in Zone 2 environments.

In addition to this publication, see:

- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.
- all publications listed in Additional Resources on page 7.

Installation Precautions

WARNING: These products must only be:
- used as a component in an EtherNet/IP In-cabinet system. System components include: supplemental power tap (Cat. No. 1834-SUP-PWR), gateway (Cat. No. 1834-AENTR), flat media cable (Cat. No. 1486-CBL-*x*), and flat media connectors (Cat. No 1486-CON-*x*).
- used within its specified ratings defined by Rockwell Automation.
- installed in compliance with the enclosure, mounting, spacing, and segregation requirements of the ultimate application.
- installed according to the instructions provided within this chapter. When this product is used in an EtherNet/IP In-cabinet system application, all system certifications apply.
- powered from a source compliant with Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV) to comply with the CE Low Voltage Directive (LVD). Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- disconnected from power before removal or replacement. Do not remove or replace a module while power is applied. Interruption of the flat cable media can result in unintentional operation or machine motion.

1486-CBL Flat Media Cable Requirements

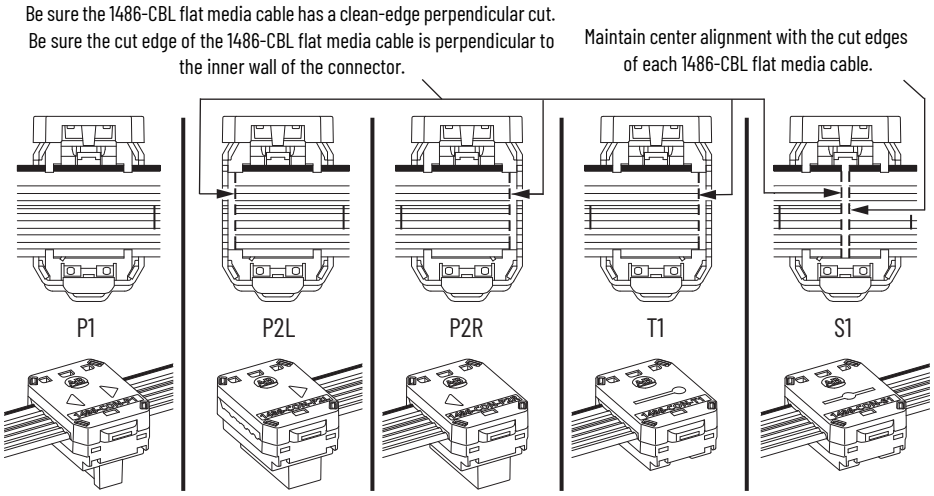
Cut and Position Requirements

The 1486-CBL flat media cable must:

- have a clean-edge cut that is perpendicular to the inner wall of the 1486-CON connector.

  IMPORTANT Do not strip the wires of the 1486-CBL flat media cable.

- be positioned depending on the type of 1486-CON connector being used.
- be placed with its gray dashed stripe aligned with the polished, dashed stripe on the 1486-CON connector tray.

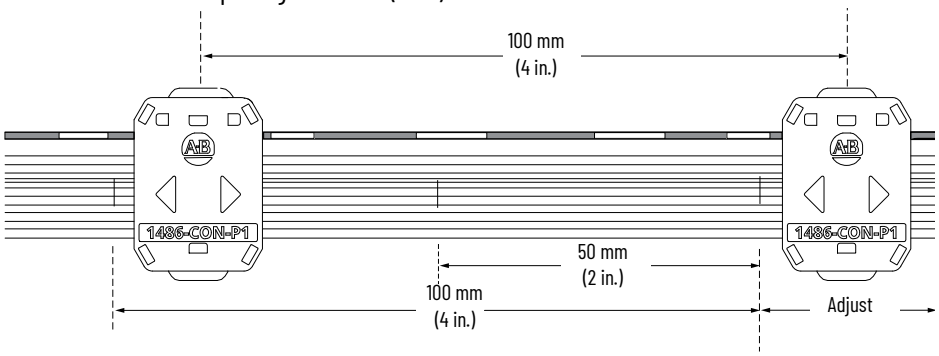


Spacing Requirements

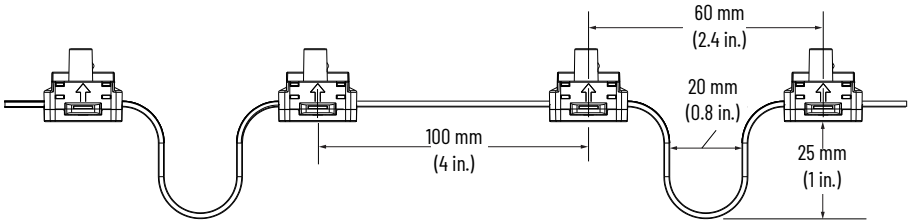
The 1486-CBL flat media cable and 1486-CON connector must be spaced as follows:

- Provide 100 mm (4 in.) of initial spacing to allow for 1486-CBL flat media cable slack to ease 1486-CON connector insertion/reinsertion.
- Adjust the spacing based on the adjacent supported device dimensions to achieve desired 1486-CBL flat media cable slack.

  The minimum spacing is 50 mm (2 in.).



Example: 1486-CBL Flat Media Cable Slack Using 100 mm (4 in.) Spacing



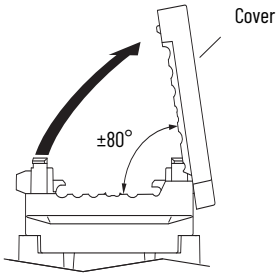
Prepare a Flat Media Cable Connector

Perform the following steps to attach a 1486-CBL flat media cable to a 1486-CON connector.

The following tools are required to perform these steps:
- scissors
- parallel-action, flat-jaw pliers

1. Inspect each end of the 1486-CBL flat media cable for a clean-cut edge.

   If necessary, recut the edge(s).
2. Lift the cover of the 1486-CON connector to access the cable tray.



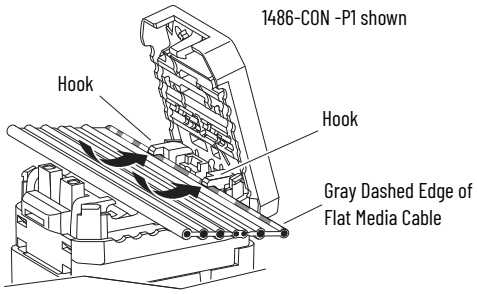
If the cover becomes separated from the 1486-CON connector:

a. Align the two tabs on the cover with the two slots on the 1486-CON connector, then apply pressure to snap the cover in back into place.

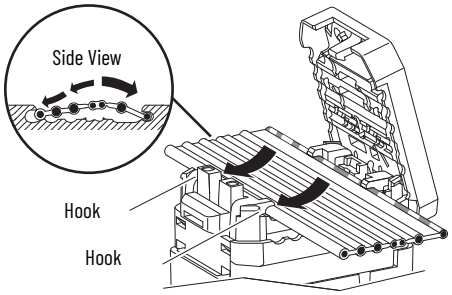
b. Repeat step 2.

3. Remove and recycle the paper insert from the 1486-CON connector.
4. Position the gray dashed edge of the 1486-CBL flat media cable facing the hinged side of the 1486-CON connector.

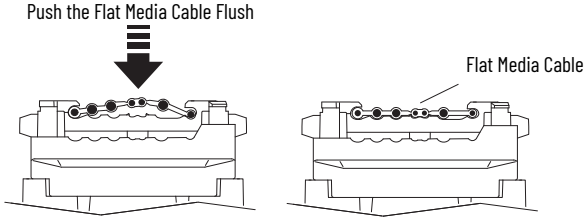
5. Align the 1486-CBL flat media cable, then insert it under the two hooks on the cable tray of the 1486-CON connector.



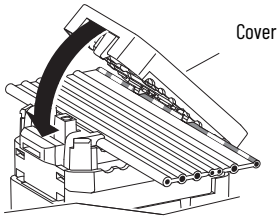
6. Gently flex the 1486-CBL flat media cable, then place the bottom edge of the 1486-CBL flat media cable under the two hooks furthest from the hinged side of the 1486-CON connector.



7. Gently push the middle of the 1486-CBL flat media cable down to be sure it is flush against the cable tray on the 1486-CON connector.

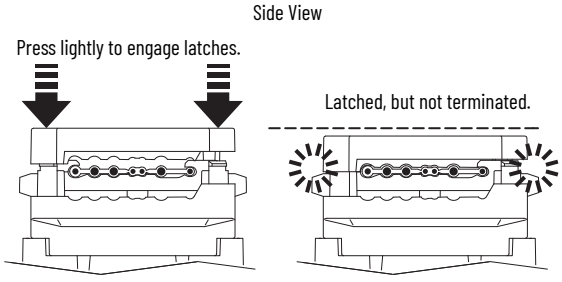


8. Slide the 1486-CBL flat media cable left or right on the 1486-CON connector based on the connector type. See 1486-CBL Flat Media Cable Requirements on page 22 for proper positioning and spacing.
9. Close the cover of the 1486-CON connector.



For 1486-CON-P1: If necessary, slide the 1486-CON-P1 connector along the 1486-CBL flat media cable to the desired final position.

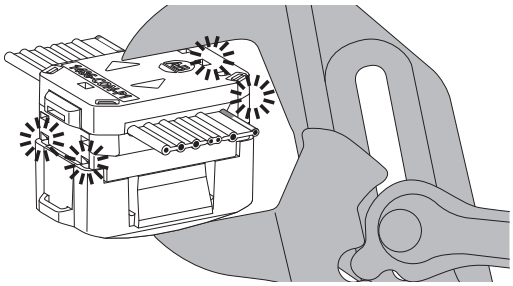
The latches on the cover will engage with the retaining latches of the cable tray.



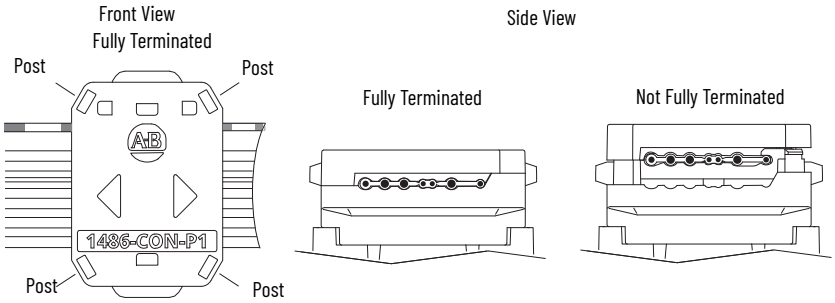
10. Use a parallel-action flat-jaw pliers (preferred) to clamp the cover and protective cap.

    The four corner posts will click into place.

    If you are using a Knipex® parallel-action pliers 86 03 250, adjust the jaw opening to 27 mm.



    When the 1486-CON connector is fully terminated, the four corner posts will be flush with the cover.



11. Verify the 1486-CBL flat media cable is fully terminated in the 1486-CON connector. If the flat media cable is not fully terminated, repeat step 8.
12. Remove and recycle the protective cap.

    For 1486-CON-S1 and 1486-CON-T1 connectors: The protective cap is not required, but is fitted onto the bottom of the connector before clamping to allow a consistent opening gap of the clamping tool.

    The 1486-CON connector is ready for installation to the supported device.

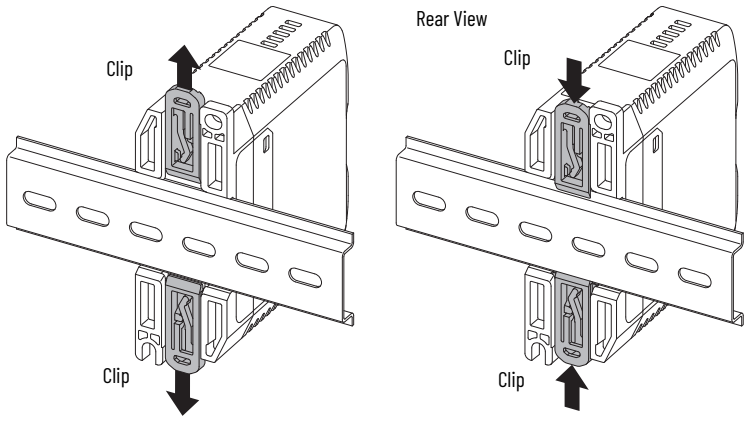
Install the 1834-AENTR Gateway

Follow the instructions below to install the 1834-AENTR gateway.

Mount the 1834-AENTR Gateway

For DIN rail mount:

ATTENTION: Secure the DIN rail to a mounting surface approximately every 20 cm (7.87 in.) and use end-anchors appropriately.

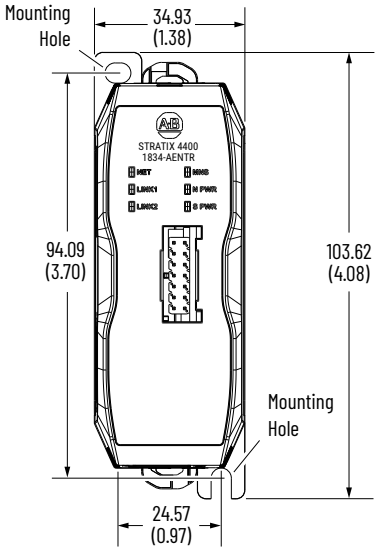


1. Pull each mounting clip away from the DIN rail as shown.
2. Place the 1834-AENTR gateway onto the DIN rail (TH35 per IEC 60715).
3. Push each mounting clip toward the DIN rail.
4. Use end anchors adjacent to the left and right sides of the 1834-AENTR gateway to lock it into place on the DIN rail.

For cabinet mount:

A pencil, level, drill, drill bit, and two M4 or #8 screws with washers (not supplied) are required for the following steps.

1. Place the 1834-AENTR gateway against the mounting surface.
2. Check for level, then place a mark at each mounting hole location.

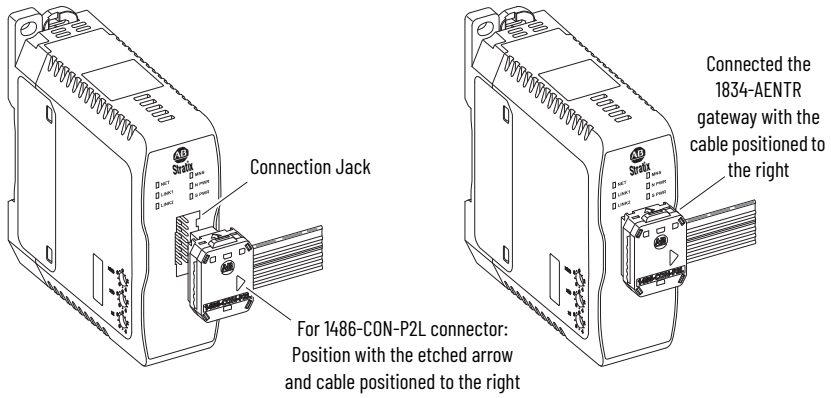


3. Set the 1834-AENTR gateway aside.
4. Drill mounting holes at the two marked locations.
5. Align the mounting holes of the 1834-AENTR gateway with the drilled mounting holes.
6. Secure the 1834-AENTR gateway with two M4 or #8 screws and washers (not provided).

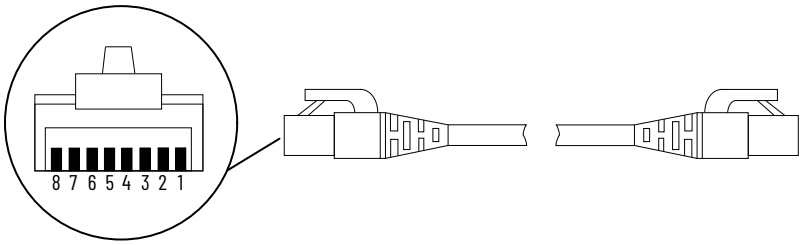
Connect the 1834-AENTR Gateway

1. Insert the 1486-CON connector with the attached 1486-CON flat cable media into the connection jack on the 1834-AENTR gateway.

   - For a 1486-CON-P2L connector (shown in illustration below):
     Be sure the etched arrow and cable are positioned left to right.
   - For a 1486-CON-P2R connector (not shown):
     Be sure the etched arrow and cable are positioned right to left.



2. Connect the 1486-CON connector to an EtherNet/IP network via the RJ45 ports located at the bottom of the 1834-AENTR gateway.
3. Connect to an EtherNet/IP network via the RJ45 ports.



Connector No.	Color	10/100/1000 Mbps Support	10/100 Mbps Support	
		8-pin Cable	8-pin Cable	4-pin Cable
1	White/Orange	BI_DA+	TxData+	TxData+
2	Orange	BI_DA-	TxData-	TxData-
3	White/Green	BI_DB+	Receive Data +	Receive Data +
4	Blue	BI_DC+	Not Used	Not Applicable
5	White/Blue	BI_DC-	Not Used	Not Applicable
6	Green	BI_DB-	Receive Data -	Receive Data -
7	White/Brown	BI_DD+	Not Used	Not Applicable
8	Brown	BI_DD-	Not Used	Not Applicable

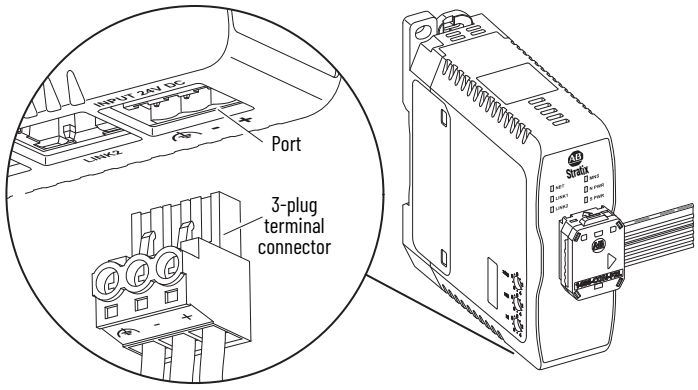
Power the 1834-AENTR Gateway

IMPORTANT The port on the underside of the gateway is for a 24V DC input from an external power supply. This port is for use with a 3-terminal connector where the:

- + terminal represents the 24V DC (+) source voltage,
- − terminal represents the common (-) terminal of source voltage, and
- ⏚ represents the functional earth ground reference for a 4-wire Ethernet side for EMC improvement.

IMPORTANT The power wires used for the power supply connection must be rated for at least 70 °C (158 °F).

Insert a 3-plug terminal connector into the 'Input 24V DC' port on the underside of the 1834-AENTR gateway.



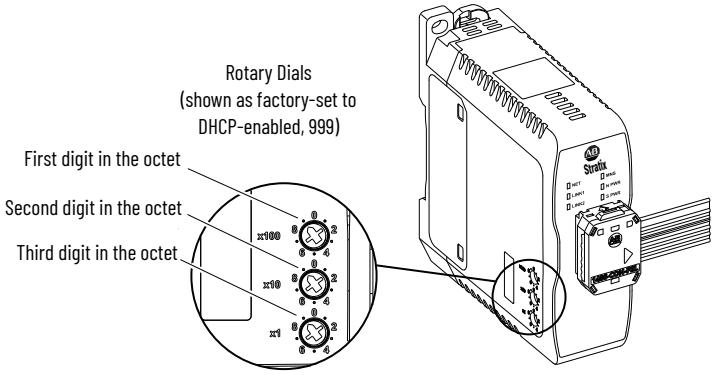
Set the IP Address for the EtherNet/IP Network

The 1834-AENTR gateway has two IP addresses:

- an EtherNet/IP address on 1000BASE-T side and
- an EtherNet/IP In-cabinet system local IP address.

The local Ethernet/IP In-cabinet IP address must start with the 1834-AENTR gateway set at 192.168.1.1

Figure 1 - Rotary Dials on the 1834-AENTR Gateway



If you will use the DCHP-enabled method:

- Your 1834-AENTR gateway is factory-set as DHCP-enabled where all three rotary dials are set to '999' for the Host ID (last octet) as shown in Figure 1.

If you will not use the DCHP-enabled method:

- Turn each rotary dial to set the Host ID. Valid numbers range from '001...254'.

IMPORTANT Set the Host ID on the rotary dials before you install the adapter.

EXAMPLE: If the IP address is 192.168.1.**120**, turn the rotary dial labeled 'x100' to '1' as the first digit in the octet, turn the rotary dial labeled 'x10' to '2' as the second digit in the octet, then turn the rotary dial labeled 'x1' to '0' as the last digit in the octet.

DHCP-supported methods to set the IP address include the following:

- BOOTP/DHCP utility
- EtherNet/IP commissioning tool

- Studio 5000 Logix designer application
- RSLinx® Classic software/FactoryTalk Linx Network Browser

To use one of these methods, you need the following:

- an EtherNet/IP driver installed on the programming workstation,
- a MAC ID from the device, which is on the label on the side of the device, and
- a recommended IP address for the device.

For more information on how to use these methods, see EtherNet/IP Network Device User Manual, publication ENET-UM006.

Follow these instructions to automatically set the IP addresses in the local EtherNet/IP In-cabinet system:

1. Determine how you want to set the network IP address for the gateway: either rotary switches or a DHCP-supported method.
2. Connect all supported devices to the 1834-AENTR gateway.
3. Apply power to the 1834-AENTR gateway.

   When power is applied to the 1834-AENTR gateway:

   - a network IP address based on the rotary dials or via DHCP is assigned,
   - the 1834-AENTR gateway's local EtherNet/IP In-cabinet system IP address of 192.168.1.1 is assigned, and
   - any user-defined devices on the local EtherNet/IP In-cabinet system are assigned IP addresses in ascending order (such as 192.168.1.2, 192.168.1.3, and 192.168.1.4).

   For an initially set-up of an EtherNet/IP In-cabinet system:
   The 1834-AENTR gateway automatically assigns IP addresses for supported devices on the local EtherNet/IP In-cabinet system.

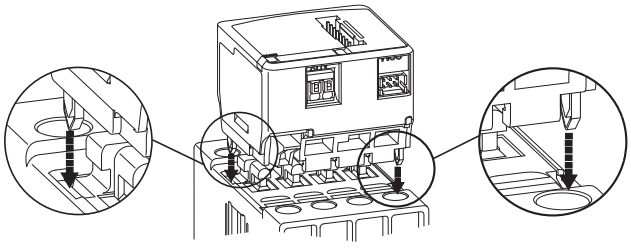
   For a previously configured EtherNet/IP In-cabinet system:
   The 1834-AENTR gateway will use the user-defined reference topology.
   See Set the Reference Topology on page 49 for more information.

Install a Contactor Communication Interface Module

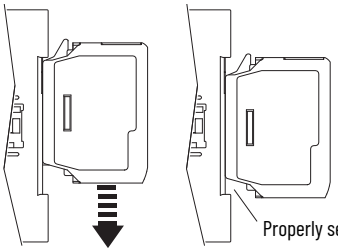
Follow these instructions to install a 100-E-INT, 100-E-INT-D, 100-E-INT-X, 104-E-INT-D, or 104-E-INT-X contactor communication interface module.

For a list of available contactor communication interface modules to best suit your application to connect to the bus, see page 10.

1. Place the contactor communication interface module at the front of the 100-E contactor cover.
2. Align the link bars into the slots of the 100-E contactor, then push the contactor communication module toward the 100-E contactor.



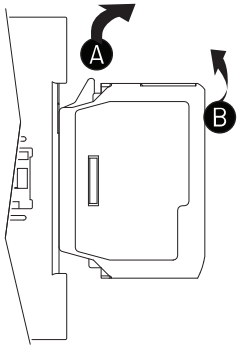
3. Slide the contactor communication interface module in parallel direction to the 100-E contactor front cover until the plunger comes into contact with the crossbar on the 100-E contactor.



If the contactor communication interface module needs to be reseated:

a. Pull the plastic detent clip away from the front of the 100-E contactor [A] and slide the contactor communication interface module upward and away [B] from the 100-E contactor.

b. Repeat steps 1...3.

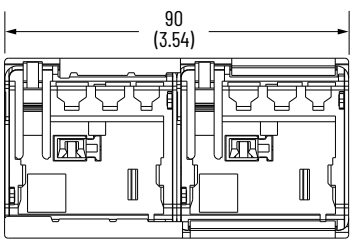


Adjust the Contactor Communication Interface Module: Reversing Contactors

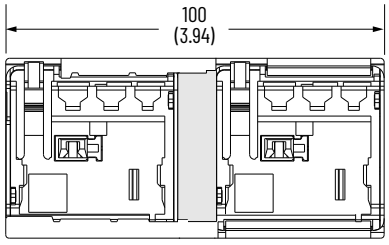
The 104-E-INT-D and 104-E-INT-X reversing connector communication interface modules can be adjusted to various sizes to accommodate the 100-E contactor.

To adjust, slightly flex apart the sides of the double-wide cover during adjustment.

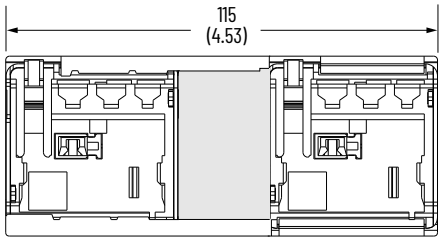
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Size 1 and 2
104-E09... E38



Size 3
104-E40... E65



Size 3.5
104-E80... E96

Build Motor Starter Configurations

You can build 2-component and 3-component motor starter configurations using a 140ME MPCB or 140MT MPCB, an E100 motor branch circuit protective device, and a serial communication cable (Cat. No. 100-E-X-CBL).

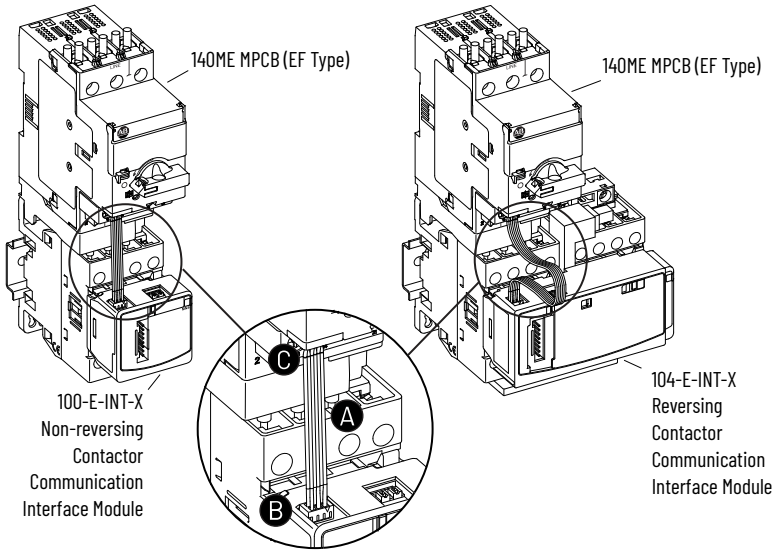
Follow the steps below to build a 2-component or a 3-component motor starter configuration.

The following items are required to complete a 2-component configuration:
- serial communication cable, Cat. No. 100-E-X-CBL
- auxiliary wires

2-component Configuration

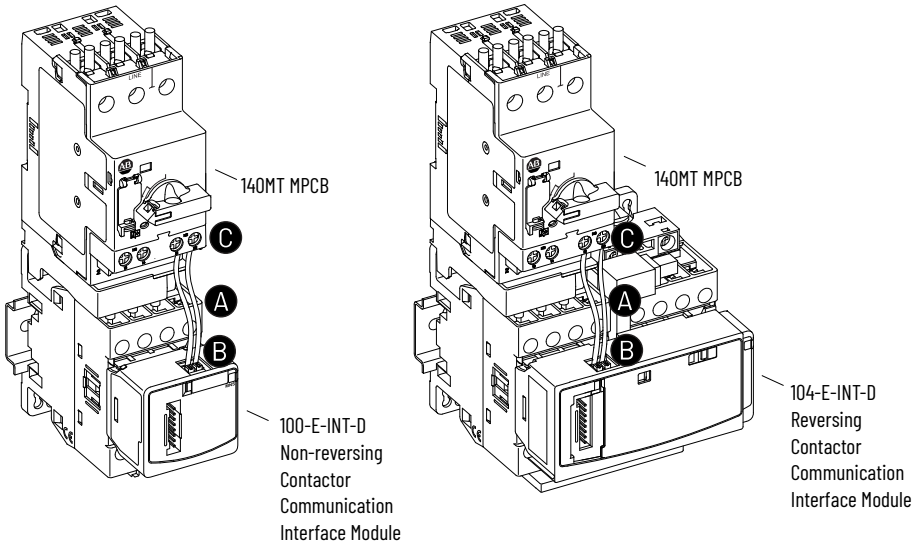
For 2-component configurations with a 140ME MPCB (EF type, advanced version):

- Connect a Cat. No. 100-E-X-CBL serial communication cable [A] from the data port on the contactor communication interface module [B] to the data port on the underside of the 140ME MPCB (MPCB) [C].



For 2-component configurations with a 140MT MPCB:

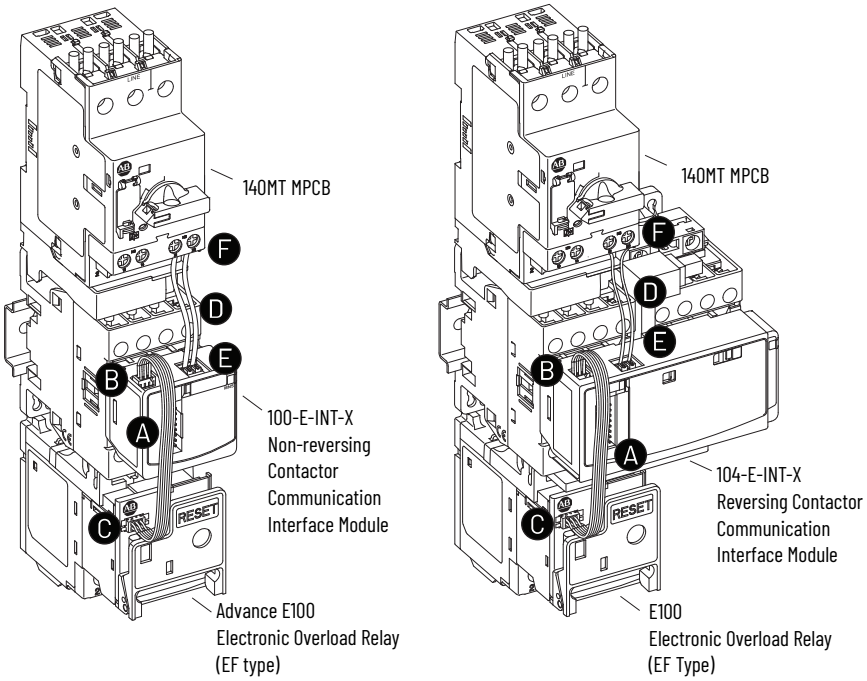
- Connect auxiliary wires [A] from the auxiliary input terminals [B] on the contactor communication interface module to the auxiliary output terminals [C] on the 140MT MPCB.



3-Component Motor Starter Configuration

For 3-component configurations with a 140MT MPCB:

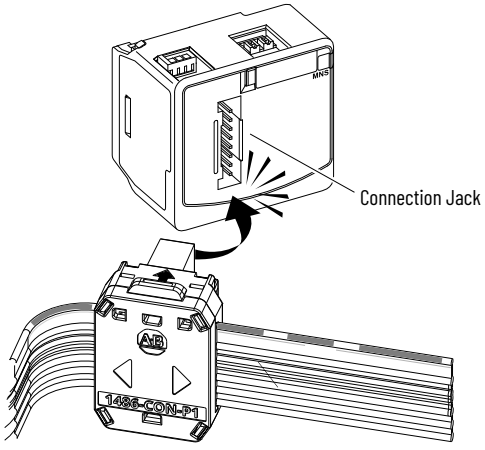
1. Connect a Cat. No. 100-E-X-CBL serial communication cable [A] from the data port [B] on the contactor communication interface module to the front port [C] of an advanced E100 electronic overload relay (EF type).
2. Connect auxiliary wires [D] from the auxiliary input terminals [E] on the contactor communication interface module to the auxiliary output terminals [F] on the 140MT MPCB.



Install a 100-E/104-E Contactor to the Bus

Follow these steps to install a 100-E/104-E contactor to the bus.

1. Remove the plastic protective cap from the 1486-CON connector.
2. Attach the 1486-CON connector to the connection jack of the contactor communication interface module.



Shown: 1486-CON-P1 Connector with 1486-CBL Flat Media Cable

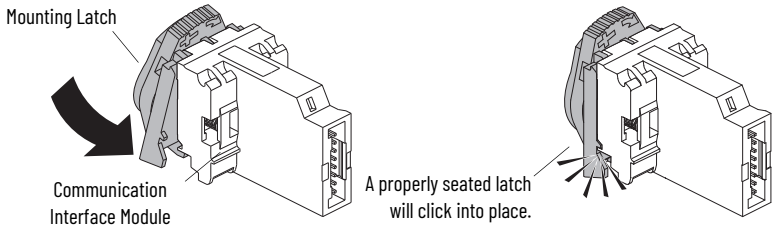
The 1486-CON connector will click into place.

Install an 800F Operator to the Bus

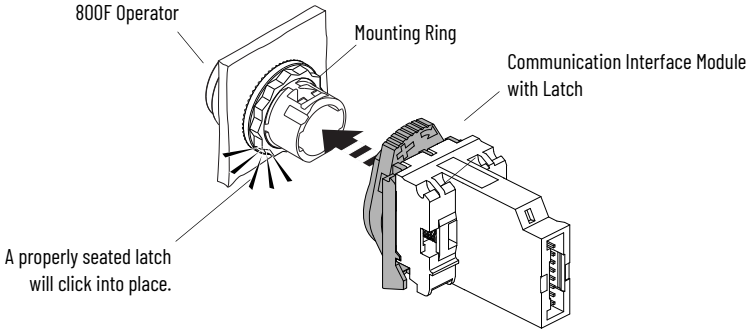
Follow these steps to install an 800F operator to the bus using a push button communication interface module.

- See 800F Communication Interface Modules for 800F Operators on page 11 for a list of supported 800F-INT modules to best suit your application.
- To ease installation, connect the push button communication interface module to the mounting latch before you connect the latch to the operator.

1. Attach the push button communication interface module onto the mounting latch of the 800F operator.



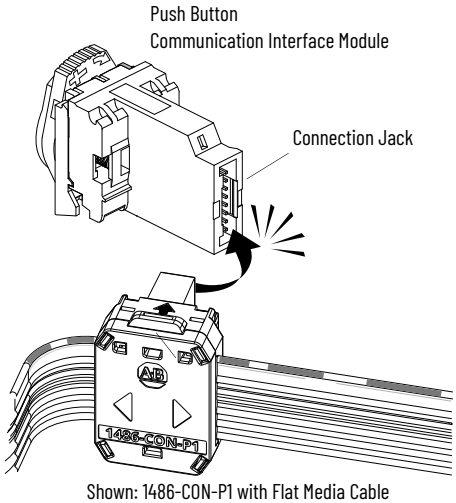
2. Tighten the mounting ring on the 800F operator to the recommended torque listed in 22 mm Push Button Specifications Technical Data, publication 800-TD008.
3. Attach the latch with communication interface module onto the 800F operator.



An audible 'click' designates a properly seated communication interface module.

If the communication interface module is not properly seated, see Reseat the Communication Interface Module.

4. Attach the 1486-CON connector into the connection jack of the push button communication interface module.



Shown: 1486-CON-P1 with Flat Media Cable

The 1486-CON connector will click into place.

Reseat the Communication Interface Module

If the latch is not properly seated on the operator/panel:

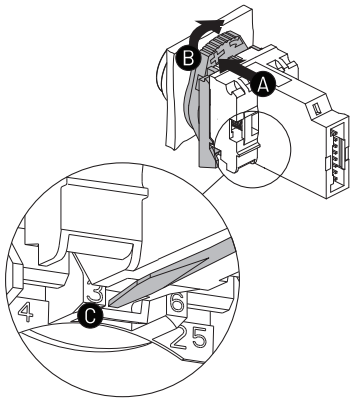
1. Insert a small flathead screwdriver (for example, Cat. No. 1492-N90) into the latch collar (A), then rotate the latch collar (B) to the right.

   If a screwdriver is not available, the latch collar can be rotated by hand by applying pressure to latch collar (B),

2. Follow the steps within Install an 800F Operator to the Bus to re-install the communication interface module.

If the communication interface module needs to be reseated:

1. Remove the latch with communication interface module from the 800F operator.
2. Insert a small flathead screwdriver into the lever (C) on the bottom of the communication interface module.
3. Gently pry the lever down until the communication interface module is released from the mounting latch of the 800F operator.
4. Follow the steps within Install an 800F Operator to the Bus to re-install the communication interface module.

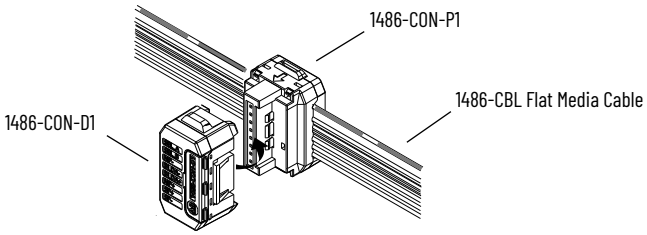


Maintenance and Replacement

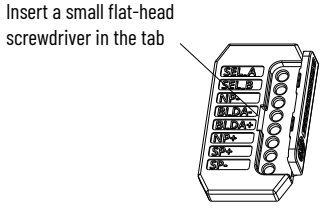
If a 1486-CBL flat media cable has already been crimped with a 1486-CON-P1 connector and will remain unattached or unplugged from a communication interface, the 1486-CON-D1 connector temporarily replaces a missing communication interface device.

Follow these instructions to maintain the correct line impedance and communication to the bus cable.

1. Attach a 1486-CON-D1 connector to the 1486-CON-P1 connector.



2. Using a small flat-head screwdriver, gently pry open the hinged door on the 1486-CON-D1 connector to obtain access to test points.



Typical EtherNet/IP In-cabinet Architecture

EtherNet/IP In-cabinet systems extend EtherNet/IP™ connectivity to field devices, including:

- Simplified installation and reduced wiring in panels
- Integrated connectivity for improved runtime data and diagnostics

Typical Commissioning Workflow

When you build an EtherNet/IP In-cabinet system, follow these steps:

1. Prepare the panel.
2. Layout all hardware.
3. Install the DIN rail and cable routing systems.
4. Mount the EtherNet/IP In-cabinet system devices.
5. Install the control hardware, including the 1834-AENTR gateway, controller, and power supply.
6. Connect the Ethernet cable to the controller, 1834-AENTR gateway, Ethernet switch, and other standard EtherNet/IP devices.
7. Connect the 1486-CBL flat media cable from the 1834-AENTR gateway to all other EtherNet/IP In-cabinet devices and include the end node terminator (1486-CON-T1).
8. Complete the control wiring and power wiring.
9. Check and tighten all connections.
10. Apply power to the system.

    The 1836-AENTR gateway automatically assigns the IP addresses of node devices.
11. Complete system configuration in a Logix 5000® controller project.

Example Configurations

The example configurations below provide examples using a communication interface along with various components.

Architecture

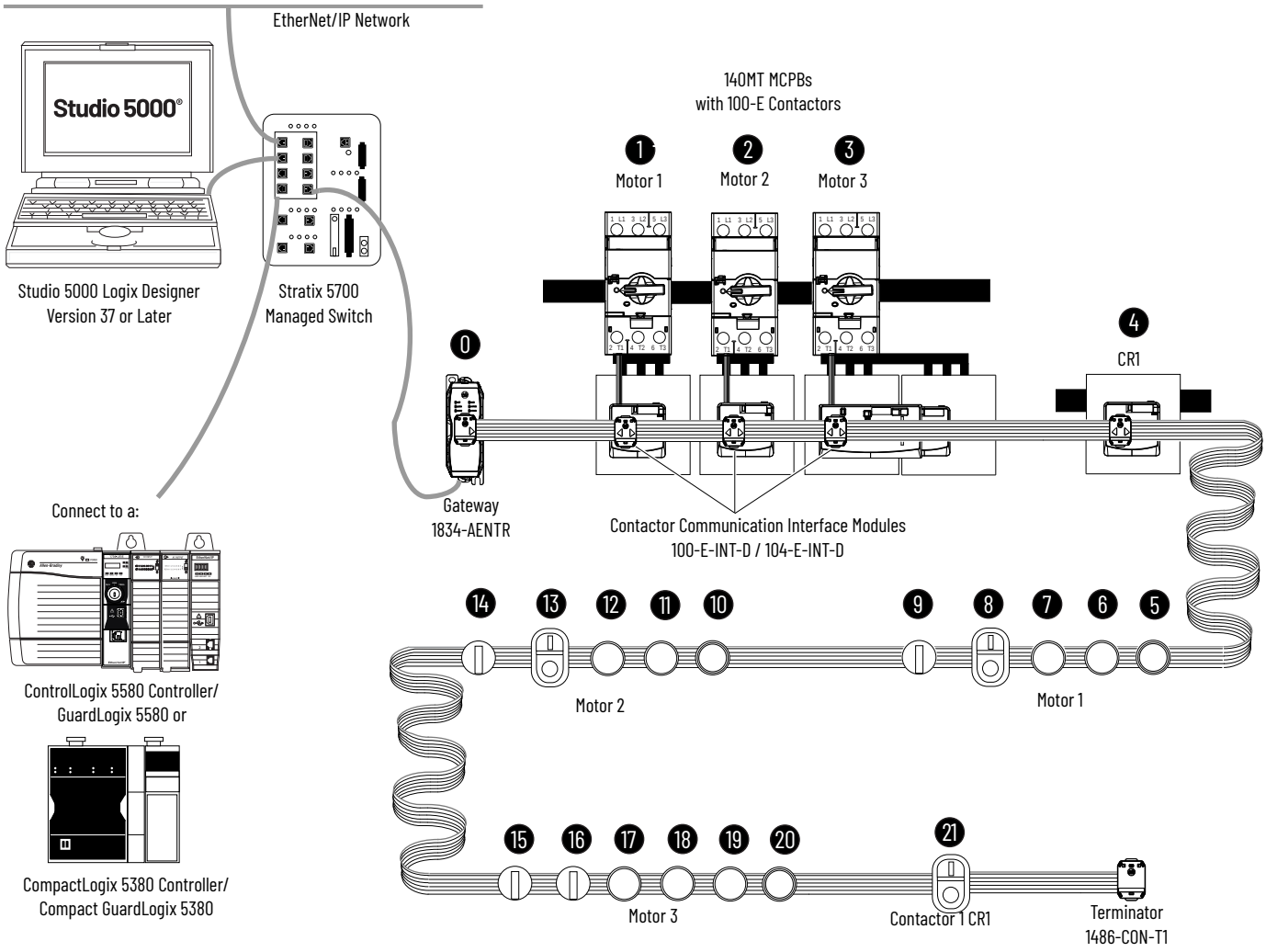
This example architecture is a 23-node system with motor starters and panel operators with these details:

- Three motor loads
- One contactor
- 2-wire and 3-wire control
- Hands-off-auto (HOA) control
- Pilot lights

The architecture layout in Figure 2 on page 36 is important for comparison of the position location and device allocation. If a device is moved in the local network or fails and is removed, the architecture drawing is critical to validate the reference architecture to the actual.

In Figure 2, the numeric value shown above each node indicates the position on the media.

Figure 2 - Example Architecture



The IP addresses are automatically assigned when power is applied to a new device as the first available IP address.

The devices in the example architecture above have these IP addresses:

Position on the Media	Local Bus Node IP Address	Communication Module Type	Name
0	192.168.1.1	1834-AENTR	Gateway
1	192.168.1.2	100-E-INT-D	Motor Starter 1
2	192.168.1.3	100-E-INT-D	Motor Starter 2
3	192.168.1.4	104-E-INT-D	Motor Starter 3
4	192.168.1.5	100-E-INT-D	Contactor 1 CR1
5	192.168.1.6	800F-INT	Motor 1 Fault/Reset
6	192.168.1.7	800F-INT	Motor 1 Stopped
7	192.168.1.8	800F-INT-L	Motor 1 Run
8	192.168.1.9	800F-INT-L	Motor 1 Start/Stop
9	192.168.1.10	800F-INT-L	Motor 1 HOA
10	192.168.1.11	800F-INT-L	Motor 2 Fault/Reset
11	192.168.1.12	800F-INT-L	Motor 2 Stopped

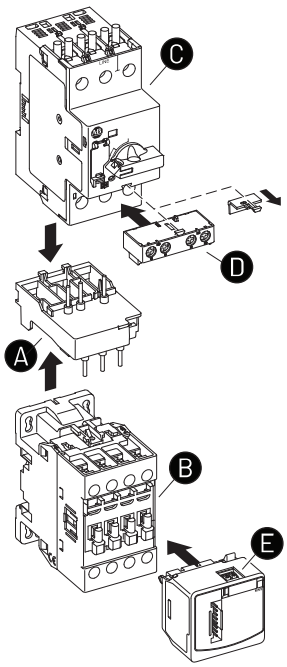
Position on the Media	Local Bus Node IP Address	Communication Module Type	Name
12	192.168.1.13	800F-INT-L	Motor 2 Run
13	192.168.1.14	800F-INT	Motor 2 Start/Stop
14	192.168.1.15	800F-INT	Motor 2 HOA
15	192.168.1.16	800F-INT	Motor 3 HOA
16	192.168.1.17	800F-INT	Motor 3 Start/Stop (FWD/OFF/REV)
17	192.168.1.18	800F-INT-L	Motor 3 Run FWD
18	192.168.1.19	800F-INT-L	Motor 3 Run REV
19	192.168.1.20	800F-INT-L	Motor 3 Stopped
20	192.168.1.21	800F-INT-L	Motor 3 Fault/Reset
21	192.168.1.22	800F-INT-L	Contactor 1 Start/Stop
–	–	1486-CON-T1	Media Terminator

Motor Circuit Protection

Use this configuration when you are protecting your motor, but do not require overload protection.

Assemble a motor starter configuration using both the 100-E and 104-E contactors along with the equivalent rated 140MT MPCB. Components in this example include:

- 140MT-C-PE16: connection module [A]
- 100-E09EJ10: IEC contactor with 24V DC low consumption coil [B]
- 140MT-C3E-B25: 1 HP, 460V, 2.5 A, C-Frame MPCB [C]
- 140MT-C-AFAR10A10: trip-contact [D]
- 100-E-INT-D: communication interface, 100-E non-reversing [E]

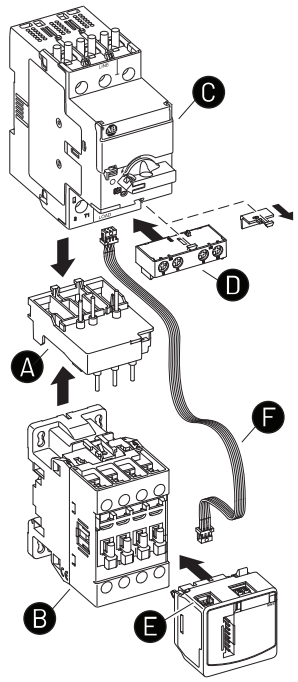


1. Use the 140MT-C-PE16 connection module [A] to connect the 100-E09EJ10 IEC contactor [B] to the 140MT-C3E-B25 MPCB [C].
2. Mount the 140MT-C-AFAR10A10 trip contact [D] to the front of the 140MT-C3E-B25 MPCB [C].
3. Attach the 100-E-INT-D communication interface [E] to the 100-E09EJ10 IEC contactor [B].
4. Wire the normally open (N.O.) trip contact [D] and auxiliary terminal points in series to the auxiliary input of the communication interface [E].

Motor Protection Circuit Breaker

Assemble a motor starter configuration using both 100-E and 104-E contactors with the equivalent rated 140ME MPBC. The 140ME MPBC provides the short circuit and motor overload protection for the motor branch circuit. Components in this example include:

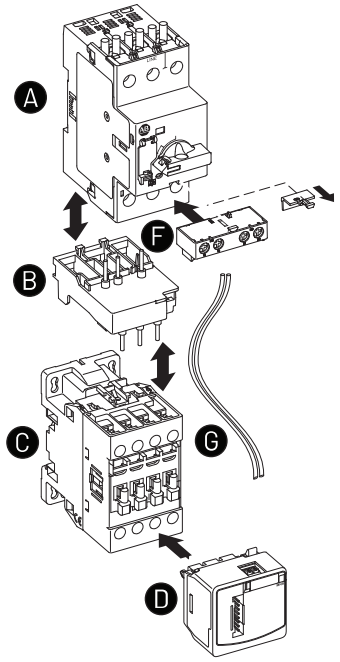
- 140MT-C-PE16: connection module [A]
- 100-E09EJ10: IEC contactor with 24V DC low consumption coil [B]
- 140ME-D9EF-B10: 0.63 HP, 1 A, D-Frame, high breaking capacity MPCB [C]
- 140MT-C-AFAR10A10: trip-contact [D]
- 100-E-INT-X: communication interface, 100-E non-reversing [E]
- 100-E-X-CBL: serial communication cable [F]



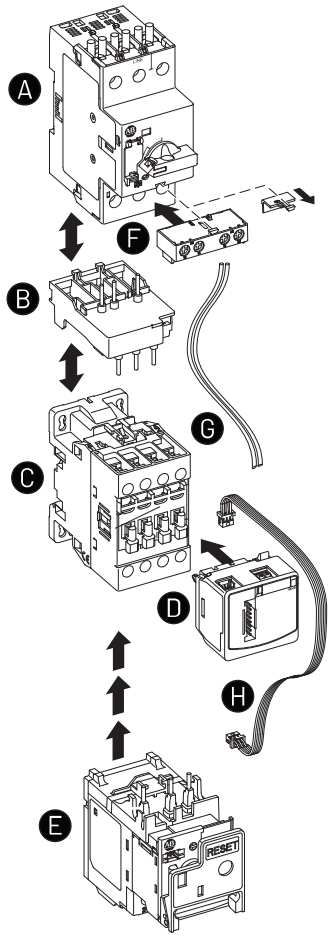
1. Use the 140MT-C-PE16 connection module [A] to connect the 100-E09EJ10 IEC contactor [B] to the 140ME-D9EF-B10 MPCB [C].
2. Mount the 140MT-C-AFAR10A10 trip contact [D] to the front of the 140ME-D9EF-B10 MPCB [C].
3. Attach the 100-E-INT-X communication interface [E] to the 1100-E09EJ10 IEC contactor [B].
4. Attach one end of the 100-E-X-CBL serial cable [F] to the 140ME-D9EF-B10 MPCB [C].
5. Attach the free end of the 100-E-X-CBL serial cable [F] to the data port on the 100-E-INT-X communication interface [E].

Motor Starters

2-component Motor Starter



3-component Motor Starter



Note Letter	For a 2-component Motor Starter	For a 3-component Motor Starter
A	140MT-C3E-B25: 1 HP, 460V, 2.5 A, C-Frame MPCB	
B	140MT-C-PE16: Connection Module	
C	100-E09EJ10: IEC contactor with 24V DC Low Consumption Coil	
D	100-E-INT-D: Communication Interface	100-E-INT-X: Communication Interface, Non-reversing, E100
E	–	193-1EFCF: E100 Overload Module
F	140MT-C-AFAR10A10: Auxiliary Contact	
G	Auxiliary Wire Assembly	
H	–	100-E-X-CBL: Serial Communication Cable for Port Expansion

2-component Motor Starter

1. Connect the 100-E09EJ10 IEC contactor with 24V DC low consumption coil [C], the 140MT-C-PE16 connection module [B], and the 140MT-C3E-B25 MPCB [A].
2. Connect the 100-E-INT-D communication interface [D] to the 100-E09EJ10 [C].
3. Strip and connect the auxiliary wires [G] to the 140MT-C-AFAR10A10 auxiliary contact [F].
4. Strip and connect the remaining ends of the auxiliary wires [G] to the auxiliary input push-in terminals on the 100-E-INT-D communication interface [D].

3-component Motor Starter

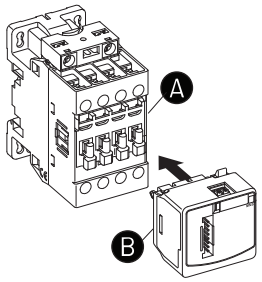
1. Connect the 100-E09EJ10 IEC contactor with 24V DC low consumption coil [C], the 140MT-C-PE16 connection module [B], the 140MT-C3E-B25 MPCB [A], and the 193-1EFCF E100 overload module [E].
2. Connect the 100-E-INT-X communication interface [D] to the 100-E09EJ10 IEC contactor [C].
3. Attach one end of the 100-E-X-CBL serial cable [H] to the port on the 100-E-INT-X communication interface [D].
4. Attach free end of the 100-E-X-CBL serial cable [H] to the data port on the front of the 193-1EFCF E100 overload module [E].
5. Connect the 140MT-C-AFAR10A10 auxiliary contact [F] to the 140MT-C3E-B25 MPCB [A].
6. Strip and connect the auxiliary wires [G] to the 140MT-C-AFAR10A10 auxiliary contact [F].
7. Strip and connect the remaining ends of the auxiliary wires [G] to the auxiliary input push-in terminals on the 100-E-INT-X communication interface [D].

Contactor Only — For Non-motor Use Application

Attach a communication interface to an IEC contactor for a non-motor use application.

Use contactors for 3-phase control or where general purpose relay ratings are exceeded. Typical uses include system interlocking, device interlocking, master control, system enable, auxiliary upstream, or downstream interlocking. Components in this example include:

- 100-E09EJ10: IEC contactor with 24V DC low consumption coil [A]
- 100-E-INT-D: communication interface that functions as a relay with the addition of an auxiliary input [B]



Attach the 100-E-INT-D communication interface [B] to the 100-E09EJ10: IEC contactor [A].

Notes:

Configure a System

Before you can configure the EtherNet/IP In-cabinet system, you must use the Logix Designer application to create a controller project. To create a controller project you must:

- create a new project,
- select the appropriate controller, then
- define controller properties.

You can connect the EtherNet/IP In-cabinet system to either the EtherNet/IP port on the controller or via a separate EtherNet/IP communication device in the chassis. If you connect via a separate EtherNet/IP communication device, you must add that device to the 'Controller Organizer' in the controller project.

Requirements

- Studio 5000 Logix Designer application, version 37 or later

  To update to version 37 or later, see the Product Compatibility and Download Center (PCDC) at rok.auto/pcdc.

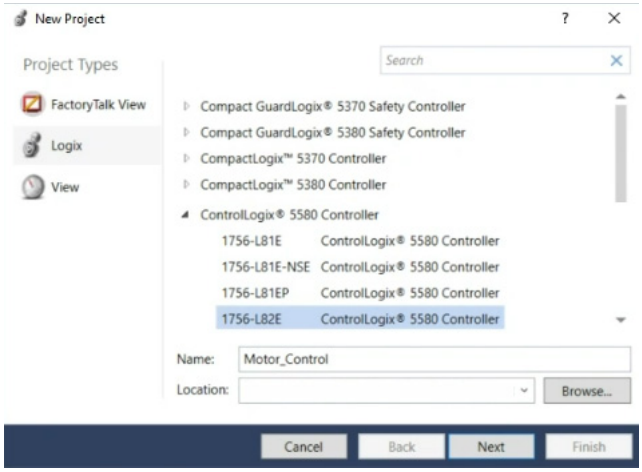
- One of these Logix 5000 controllers:
  - ControlLogix 5580 or GuardLogix 5580
  - CompactLogix 5380 or Compact GuardLogix 5380
- An EtherNet/IP In-cabinet system connected to the EtherNet/IP network with the Logix 5000 controller

See Figure 2 on page 36 for an architecture example.

Create a New Project

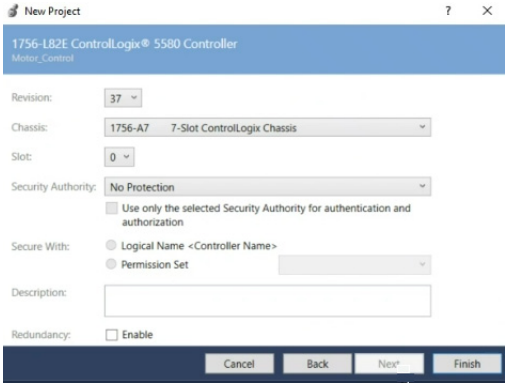
Follow these steps to create a new project.

1. Select the applicable controller from the list of available controllers.



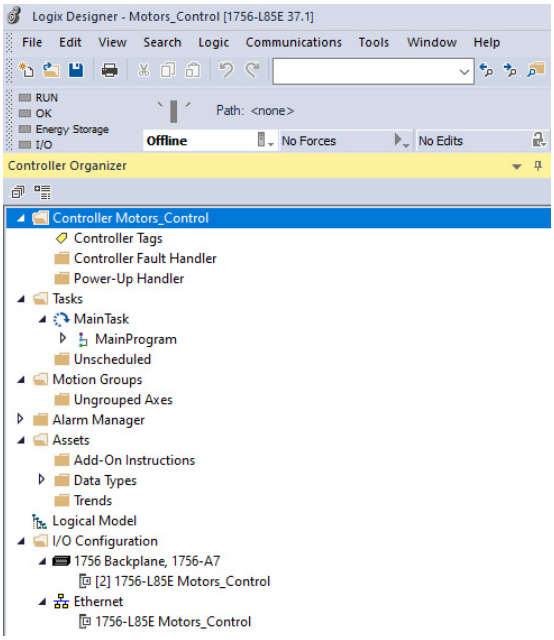
2. Type a name to describe the controller.
3. Click 'Next'.

Detail for the selected controller appears.



4. Click 'Finish'.

   The project is added in the left pane of Logix Designer.



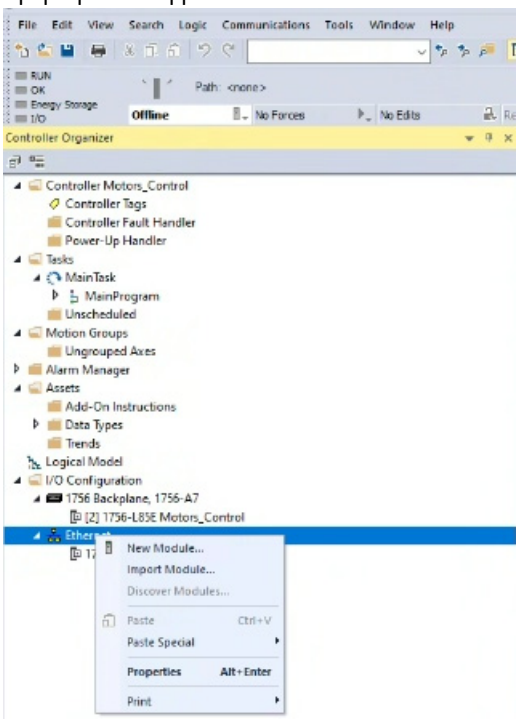
Configure the Gateway

Follow these steps to configure the 1834-AENTR gateway.

You must configure the 1834-AENTR gateway first before configuring another device.

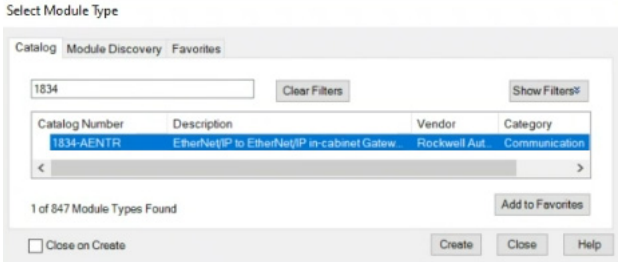
1. Right click the new project in the left pane of the screen.

   A pop-up menu appears.



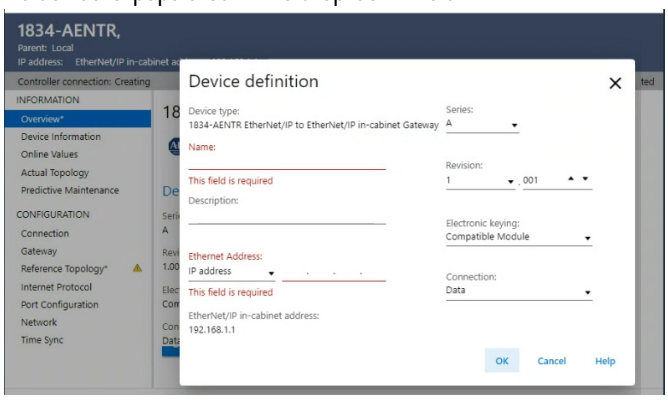
2. Select 'New Module'.

   The 'Select Module Type' dialog box appears with the 'Catalog' tab as active.



3. Type the catalog number of your module in the search field.
4. Select the correct module from the list of results.
5. Click 'Create'.

   The 'Device definition' dialog box appears from the 'INFORMATION' section with default values auto-populated in the drop-down fields.



Field	Description
Device type	Static field that displays the connected device type.
Name	Provide the name of the device.
Description	Provide a description of the device.
Ethernet Address	Provide the Ethernet/IP address of the 1834-AENTR gateway. This is the address used by other external network devices.
Series	Allows you to increment the alpha value.
Revision	Allows you to increment the numeric value.
Electronic keying	Available values are: 'Compatible Module' (default value), 'Exact Match', or 'Disable Keying'.
Connection	Displays the connection type for the device.

6. Define the parameters for the 'Name', 'Description', and 'Ethernet Address'.
7. Populate the fields and drop-down menus of your new module.
8. Select another value from the drop-down fields, if applicable.
9. Click 'OK' to save the values.

Configure the Module

Perform the steps within this section to configure an EtherNet/IP In-cabinet system.

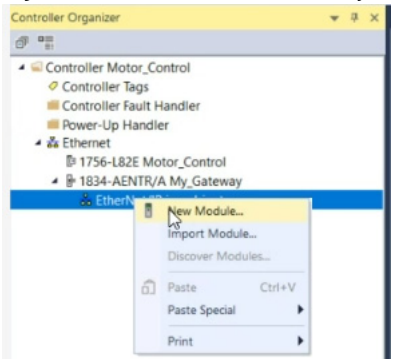
IMPORTANT You must configure the 1834-AENTR gateway to your system before adding end node connections. Complete all steps in Configure the Gateway on page 43 before proceeding.

INFORMATION Section

The example in this section is for a 104-E-INT-D starter interface. The same steps are applicable for any module of your EtherNet/IP In-cabinet system, but the screens and available drop-down selections may slightly differ.

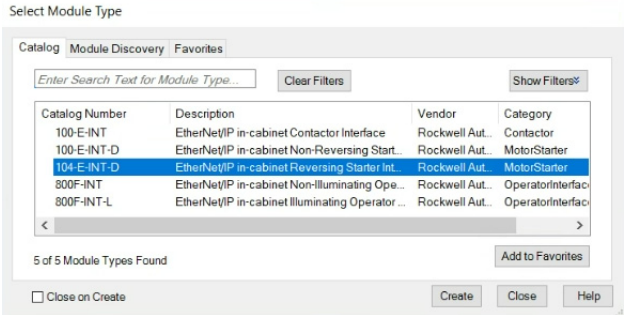
Perform the following steps to define your module.

1. Right-click EtherNet/IP In-cabinet system in the left pane of the screen.



2. Select 'New Module'.

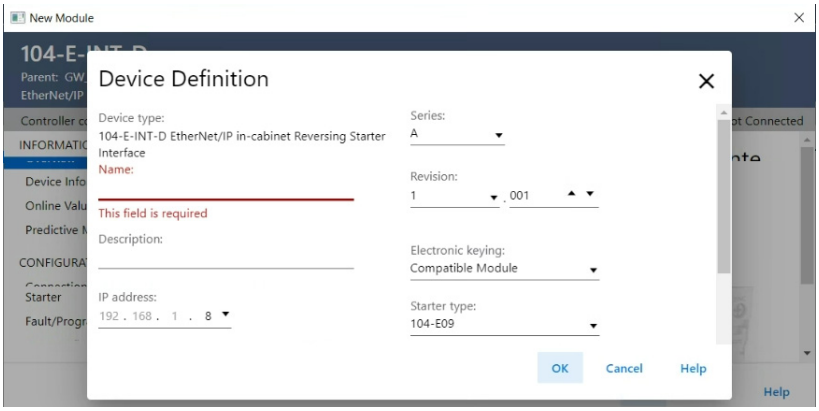
   A dialog box appears.



3. Type the catalog number of your module in the search field.

4. Select the correct module from the list of results.
5. Click 'Create'.

   The 'Device definition' dialog box appears for the 'Overview' section with default values auto-populated in the drop-down fields.



Field	Description
Device type	Static field that displays the connected device type.
Name	Type the name of the device.
Description	Type a description of the device.
IP address	Provide the final set of digits of the IP address for the device on the EtherNet/IP In-cabinet system. **TIP:** The first three sets are pre-defined by the configuration IP address.
Series	Allows you to increment the alpha value.
Revision	Allows you to increment the numeric value.
Electronic keying	Available values are: 'Compatible Module' (default value), 'Exact Mate', or 'Disable Keying'.
Starter type	Select the correct starter or contactor type from the drop-down. **TIP:** The contactor type or starter type is not verified at run time. You must manually verify that the physical hardware matches the configured type.
Controlled by	Select whether the device is controlled by one of the following drop-down options: Controller, Controller/Peer 2-wire, Controller/Peer 3-wire, Peer 2-wire, Peer 3-wire. **TIP:** The configuration of the device cannot be changed once the selection is saved. **TIP:** Depending on the selection, some fields may not be selectable.

6. Define the parameters for the 'Name' and 'Description'.
7. Populate the fields and drop-down menus of your new module.
8. Select another value from the drop-down fields, if applicable.
9. Click 'OK' to save the values.

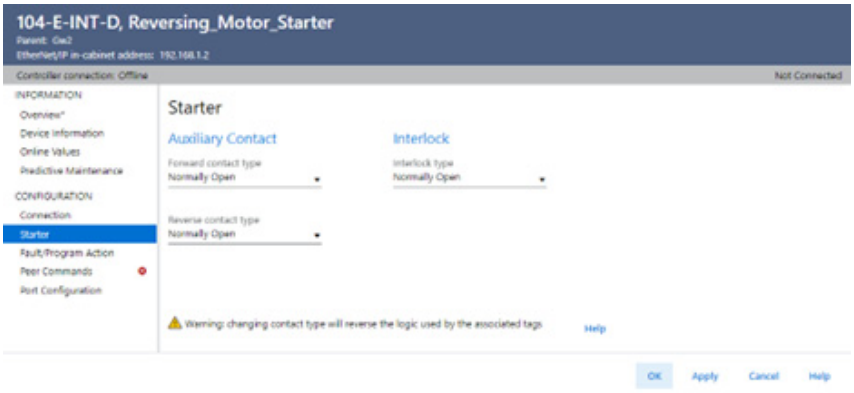
CONFIGURATION Section

The available configuration detail varies depending on the selected device. Perform the following steps to define the behavior of your device and view connection faults.

For a Starter Device

1. Click 'Connection' from the 'CONFIGURATION' section in the left navigation pane.

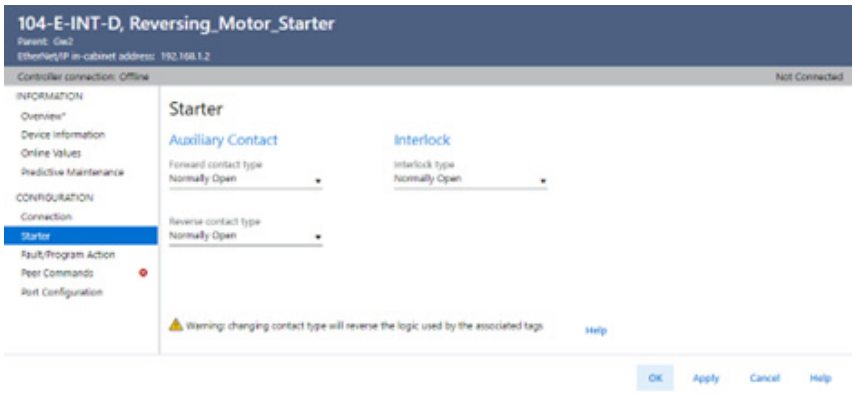
   The 'Connection' detail appears in the right pane.



Field	Description
Requested Packet Interval (RPI) (ms)	Enter the RPI rate between the controller and the device. **TIP:** The valid RPI range is shown under this field. Valid ranges and default values are dependent on the device.
Use unicast connection over EtherNet/IP	Select whether to establish unicast (default) or multicast connection over the network.
Inhibit module	Select 'Inhibit' to cause all connections to the device to be broken, which results in loss of data. **TIP:** When the device is inhibited when online, the icon representing this device in the controller organizer displays the 'Inhibited' icon.
Major fault on controller if connection fails while in Run mode	Select to configure the controller so that a connection failure causes a major fault on the controller when in Run mode.
Enable automatic diagnostics	Select to enable automatic diagnostics.

2. Click the 'Starter' section.

   The 'Starter' detail appears in the right pane.



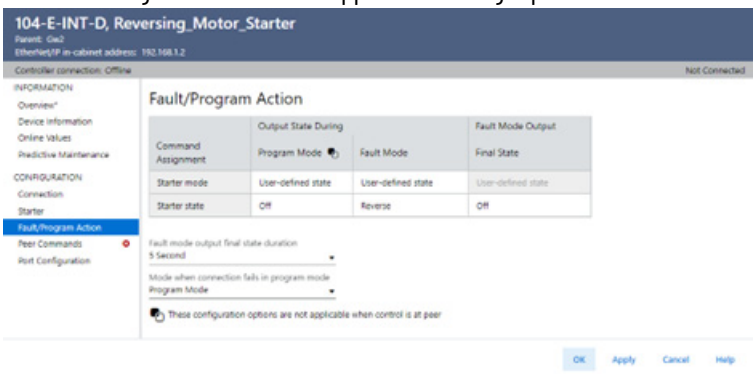
3. If the default value is not correct for your application,:
   Select the contact type from the 'Contact type' drop-down menu.

   Selecting 'Normally Closed' from either drop-down field inverts the status of the forward, reverse, and interlock contactor state sent to the controller.

Device Type	Auxiliary Contact Types	Field Values
100-E-INT-D EtherNet/IP In-cabinet non-reversing interface	• Forward contact type • Interlock type	• Normally open (default) • Normally closed
104-E-INT-D EtherNet/IP In-cabinet reversing interface	• Forward contact type • Reverse contact type • Interlock type	• Normally open (default) • Normally closed

4. Click the 'Fault/Program Action' section.

The 'Fault/Program Action' detail appears in the right pane.



The table within the 'Fault/Program Action' defines the state of the contactor when the controller is switched to the 'Program Mode' or a communication fault occurs.

The following information is provided, with 'User-defined state' and 'Off' as default values.

'Fault Mode' applies to a communication fault to the controller when 'Controlled By' is in 'Controller' mode and 'Fault Mode' applies to peer-to-peer communication fault when the 'Controlled By' is in 'Peer Mode'.

Command Assignment		Output State During: Program Mode (1)	Output State During: Fault Mode	Fault Mode Output
Starter mode		• User-defined state • Hold last state		• User-defined state • Final state
Starter state for:	100-E-INT	• Off • On		• Off • On
	104-E-INT	• Off • Forward • Reverse		• Off • Forward • Reverse

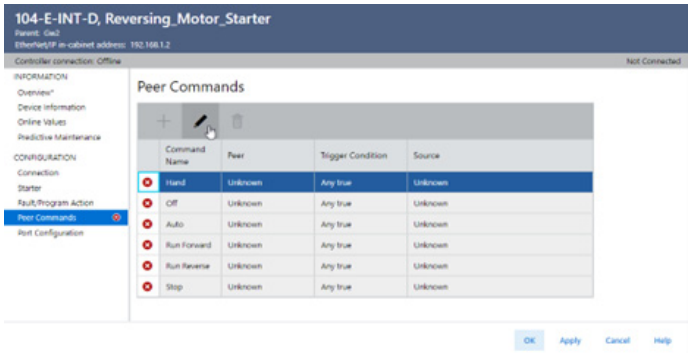
(1) Available when controlled by a controller option.

5. Select the desired value for the 'Fault mode output final state duration' and the 'Mode when the connection fails in program mode'.

Field	Available Selections	
Fault mode output final state duration	• Forever (default) • 1 Second • 2 Second	• 5 Second • 10 Second
Mode when connection fails in program mode	• Program mode (default)	• Fault mode

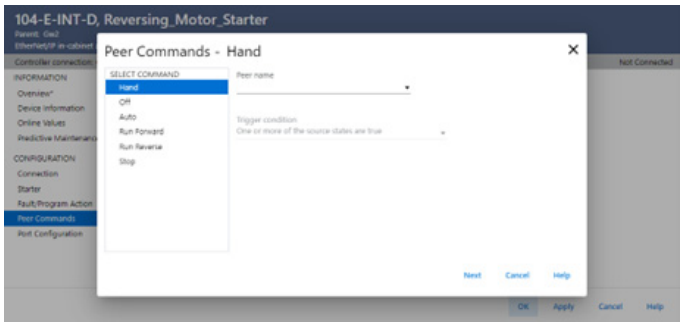
6. Click 'OK' to save the values.
7. Click 'Peer Commands' from the left pane.

   The 'Peer Commands' detail appears in the left pane.

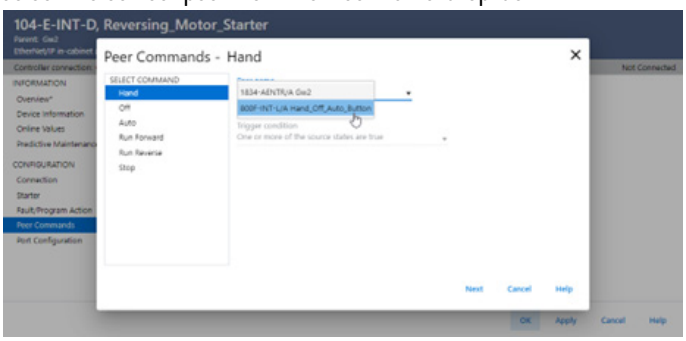


8. Select the 'Hand' command.
9. Press the 'Edit' icon.

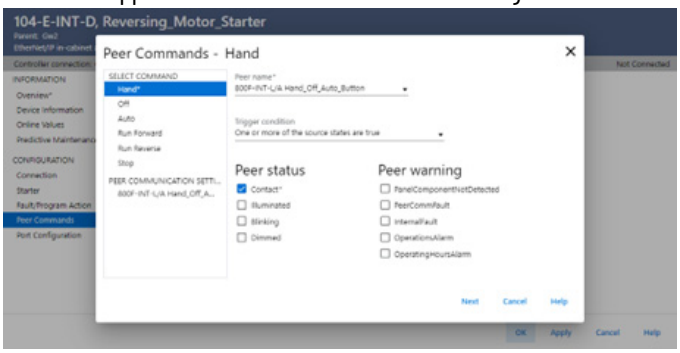
The ‘Peer Commands – Hand’ screen appears.



10. Select the correct peer from the ‘Peer name’ drop-down list.



11. Select the applicable ‘Peer Status’ and ‘Peer Warning bits’.

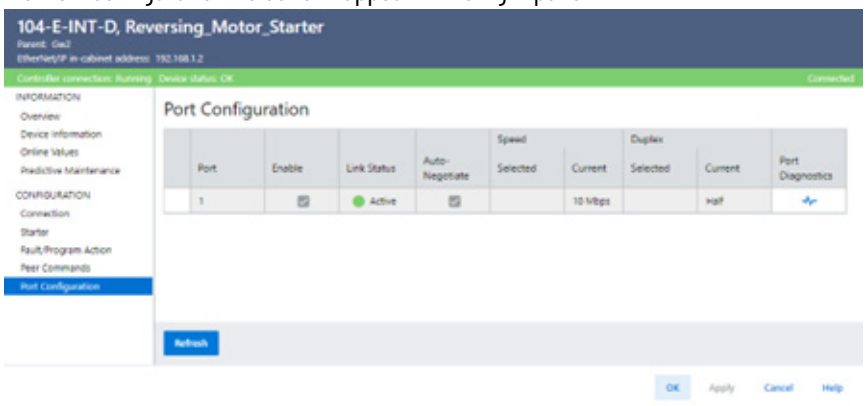


12. Click ‘Next’.
13. Follow the on-screen commands.
14. Configure up to seven peer control commands per device using the ‘Add’, ‘Edit’, or ‘Delete’ peer commands.

    For more information on device-specific parameters, see Configure Peer Commands on page 51.

15. Click ‘OK’ to save the values.
16. Click the ‘Port Configuration’ section from the left navigation pane.

    The ‘Port Configuration’ selections appear in the right pane.



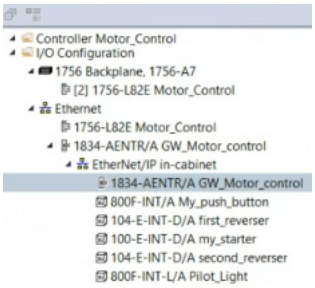
These values are only displayed when your device is online.

Parameter	Description
Auto-negotiate	*Not selectable*
Selected speed	*Not selectable*
Current speed	Displays the current speed of the port.
Selected duplex	*Not selectable*
Current duplex	Displays the current duplex of your device.
Port diagnostics	Launches the port diagnostics.

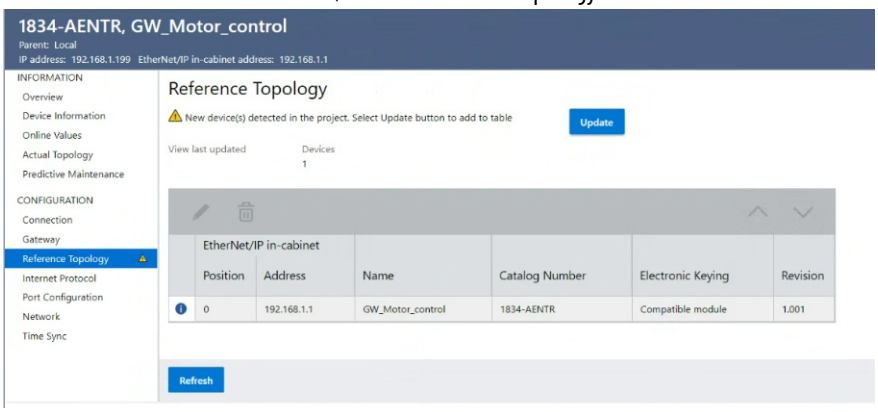
Set the Reference Topology

Once all devices are added, the reference topology must be refreshed. Follow the required steps below.

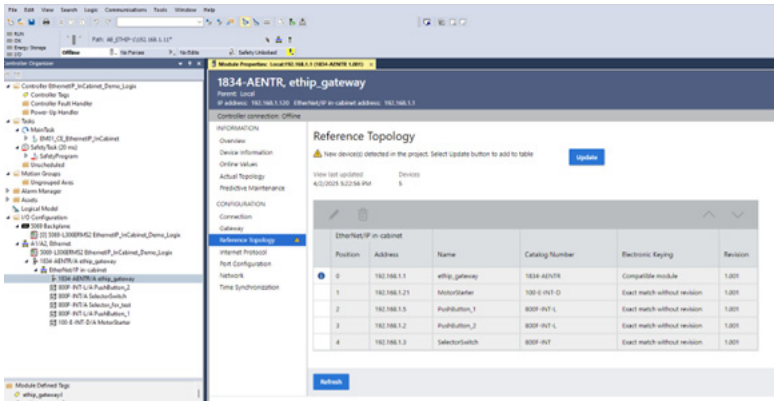
1. Select the 1834-AENTR gateway from the left pane of Logix Designer.



2. From the CONFIGURATION section, click 'Reference Topology'.

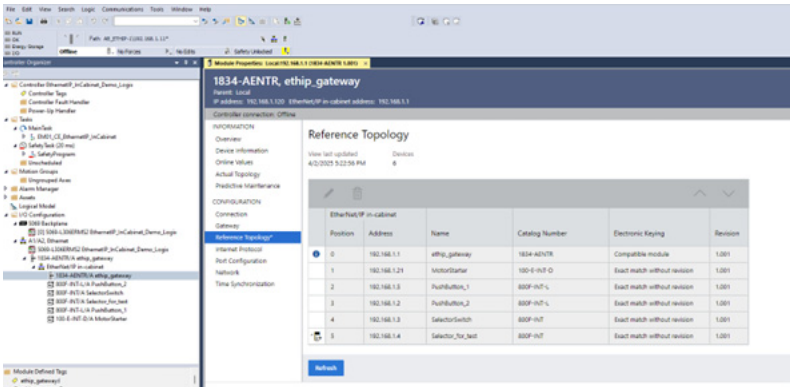


3. Press the 'Update' button.

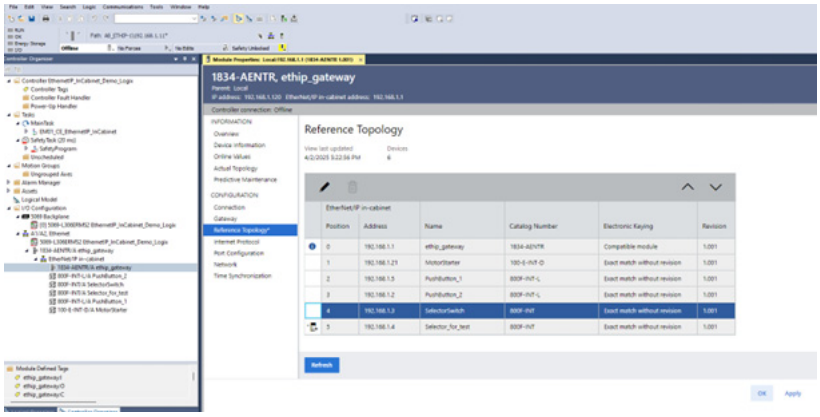


4. Match the 'Reference Topology' to the 'Actual Topology'.
   a. Select the device.

b. Use the up or down arrow to match the position of the media.



5. Click 'OK' to save the values.
6. Verify the device is positioned correctly, then press 'Apply'.



Auto-generated Controller Tags

Following the Logix commissioning of an EtherNet/IP In-cabinet system network, controller tags are auto-generated. Controller tags include configuration, inputs, and outputs for each of the devices connected. Data from the input and output assemblies would be used as description tag names to simplify programming. Configuration tags allow some data changes to each device outside of the defined add-on profiles.

For more detail on auto-generated controller tags for the EtherNet/IP In-cabinet system, see the EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001.

Configure Peer Commands

Before you configure peer commands, it is recommended to first add and configure all the EtherNet/IP In-cabinet system devices in the controller project. The devices must exist in the EtherNet In-cabinet system before you can define peer commands.

Peer-to-peer communications allow devices connected within your EtherNet/IP In-cabinet system to operate by means of receiving data from any other device and exercising actions/control based on their own configuration without communicating with the connected controller.

Once a device is configured to request peer data, the device transmits peer messages to the target devices directly regardless if they are connected to the controller or not.

Configure Illuminated 800F Peer Commands

The 'Peer Command' view allows you to configure as many as seven peer control commands per device.

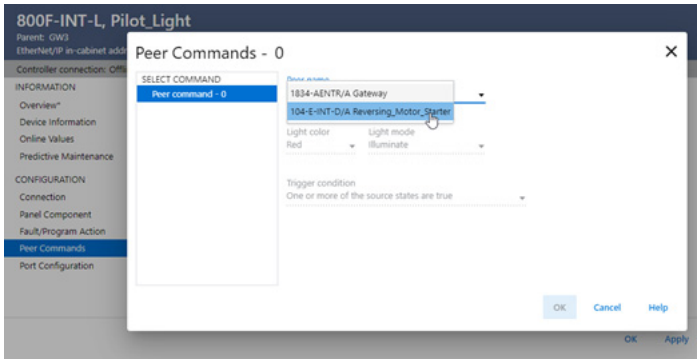
- Non-illuminated push buttons do not support peer commands.
- For 800F communication interface modules only: To access 'Peer Commands', the 'Operating Mode' must be configured to 'Peer Mode'.
- Peer Command 0 has the highest priority and Peer Command 6 has the lowest priority. The highest priority peer command with trigger conditions that are true will determine the state of the 800F LED.

Follow these steps to configure peer commands for illuminated push buttons.

1. Open an existing controller project.
2. Make sure that:
   a. the 1834-AENTR gateway has been added to the controller EtherNet/IP interface and
   b. all your EtherNet/IP In-cabinet devices are configured.
3. Click the 'Peer Commands' section from the left navigation pane.

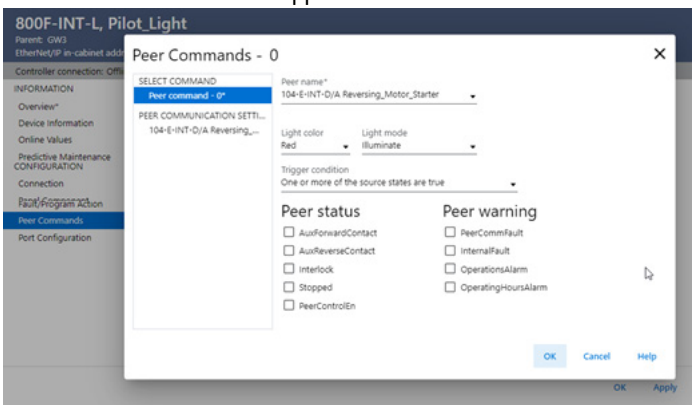
   To access 'Peer Commands', 'Controlled by' must be configured to 'Peer'.

   The 'Peer Commands' selections appear in the right pane and a pop-up window appears.



4. Select the peer name to trigger the LED actions from the drop-down menu.

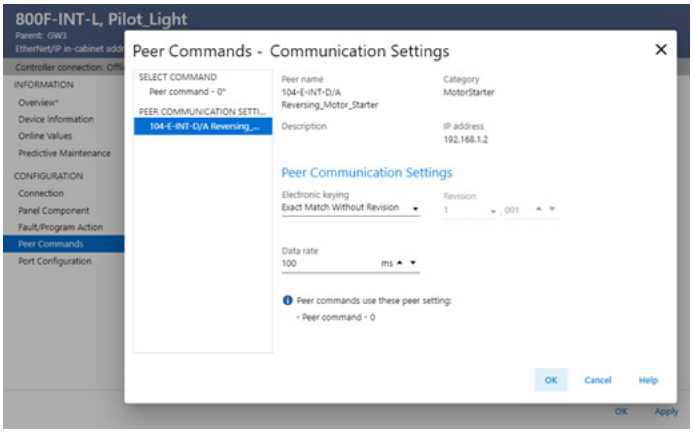
The command screen detail appears.



5. Add a new command or edit an existing command.

Parameter	Description
Peer name	Defines the source of the trigger parameters. The list contains Rockwell Automation devices available on the EtherNet/IP In-cabinet system,
Light color	A panel component with a color lens displays the lens color. Options for panel component with clear lens: • Red • White • Yellow • Magenta • Green • Blue • Turquoise • Amber
Light mode	Defines 'Light Mode' when trigger conditions are met. Options are: • Illuminate • Blink • Dim • Blink and Dim
Trigger condition	Defines the logical relation between the trigger parameters. Options are: • All of selected source states are true • One or more of the source states are true (default) • None of the selected source states are true
Peer status	Displays the peer device's status parameters
Peer warning	Displays the peer warning parameters

6. Click on each device listed below the 'PEER COMMUNICATION SETTING' in the left pane of the screen to view the current peer communication settings.



7. View and edit the peer communication settings.

Parameter	Description
Category	Displays the category of the selected peer device
IP address	Displays the IP address of the selected peer device
Peer communication settings	Setting used to communicated to the 'Target Peer' device
Electronic keying	Defines the electronic keying for peer command
Data rate	Defines the request data rate for peer data between 20...3200 ms

Configure 100-E/104-E Peer Commands

Follow the instructions below to configure 100-E/104-E peer commands.

1. Open an existing controller project.
2. Make sure that:
   a. the 1834-AENTR gateway is already added to the controller EtherNet/IP interface and
   b. all In-cabinet devices are configured.
3. Click the 'Peer Commands' section from the left navigation pane.

   To access 'Peer Commands', the 'Controlled By' must be configured to one of the following selections:
   - Controller/Peer2-Wire
   - Controller/Peer3-Wire
   - Peer2-Wire
   - Peer3-Wire

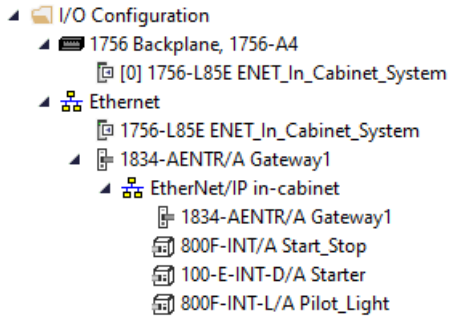
   The 'Peer Commands — Run Forward' selections appear in the right pane and a pop-up window appears.
4. Edit the peer commands for Hand, Off, Auto, RunForward, RunReverse, and Stop based on your 'Controlled by Type'.

Parameter	Description
Peer name	Defines the source of the trigger parameters. The list contains Rockwell Automation devices that are available on the EtherNet/IP In-cabinet multi-drop network.
Trigger condition	Defines the logical relation between the trigger parameters. Options are: • all of selected source states are true, • one or more of the source states are true (default), and • none of the selected source states are true.
Peer status	Displays the peer status parameters and updates when the peer device changes.
Peer warning	Displays the peer warning parameters.
Category	Displays the category of the selected peer device.
IP address	Displays the IP address of the selected peer device.
Peer communication settings	Displays communication settings of the peer commands associated with the device.
Electronic keying	Defines the electronic keying for peer command. Options are: • Exact match • Compatible module • Disable keying • Exact match without revision
Revision	Defines the expected revision used for peer communications with this device.
Data rate	Defines the request data rate for peer data between 20...3200 ms.

Peer Command Example

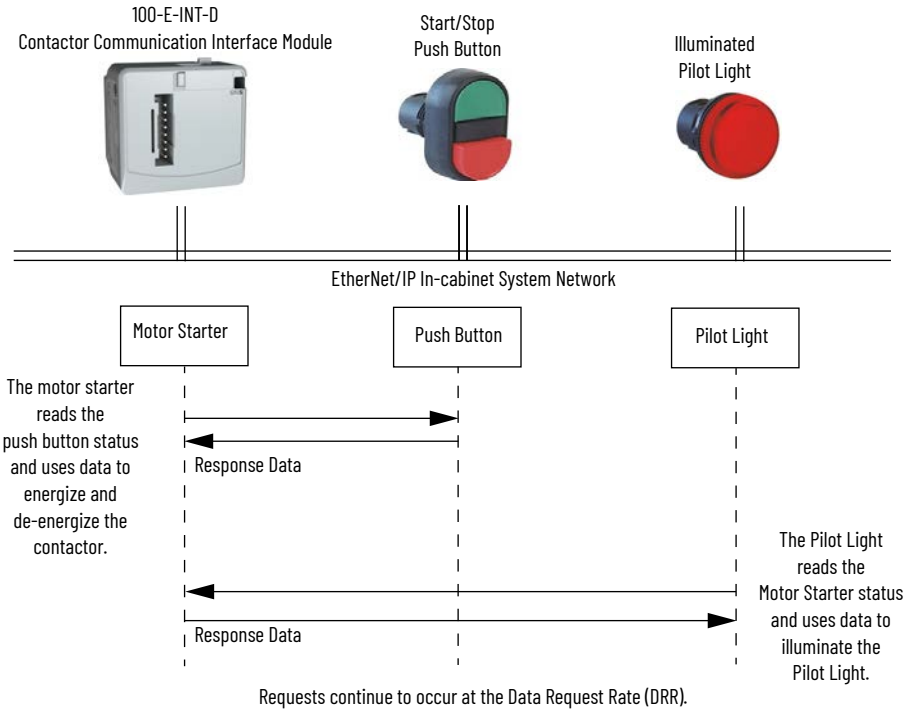
In this example, the Ethernet In-cabinet system consist of three devices:

- a start/stop push button,
- a pilot light controlled by peer, and
- a motor starter controlled by peer 3-wire.



In this example:

- the motor starter reacts to input from the start/stop push button and
- the pilot light reacts to input from the motor starter.



Motor Starter Peer Commands

Pilot Light Peer Commands

Use Peer-to-Peer Communications with CIP Security

Configuring CIP security and using peer-to-peer communications is not recommended at this time.

Monitor the System

Within the controller project within Logix Designer, you can monitor the devices in your system via the 'Module Properties' of each device where 'INFORMATION' and 'CONFIGURATION' views are displayed. This chapter provides detail for the screens within the 'INFORMATION' view.

Navigate to Information View

To navigate to the 'INFORMATION' view:

1. Open the controller project.
2. Select the device you want to monitor.
3. Select 'Properties'.

   The properties of the selected device appears, displaying 'INFORMATION' and 'CONFIGURATION' views in the left pane of the screen.

From the 'INFORMATION' view, 'Overview', 'Device Information', 'Online Values', and 'Predictive Maintenance' detail is available.

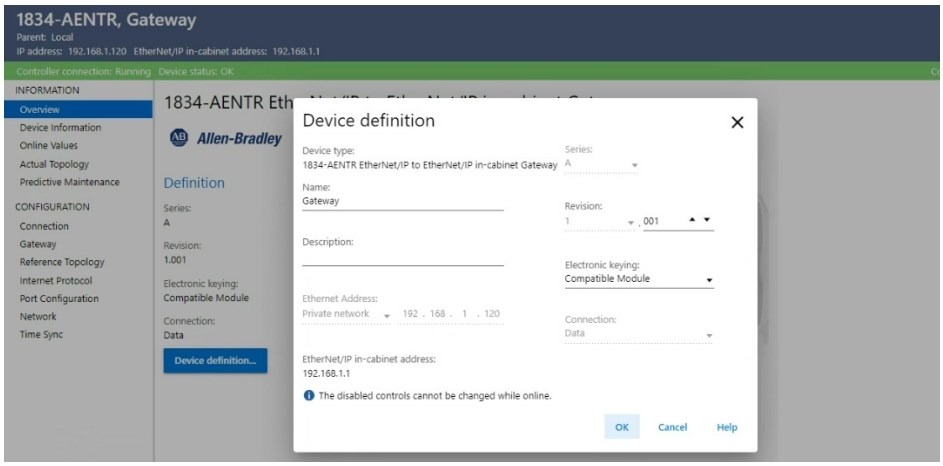
Monitor the Gateway

When the gateway is the selected device within the controller project and the 'INFORMATION' screen is selected, the following views are available.

Overview

The 'Overview' displays the current gateway device.

Definition for this device can be viewed via the Device definition button.



Device Information

Use the 'Device Information' view to view device and status information when the device is online.

The data in the 'Device Information' view comes directly from the device.

Parameter	Action
Refresh	Refreshes the 'Device Information' view to show any changes.
Device locator	Launches the 'Device locator' dialog box.
Reset device	Returns the device to its power-up state.

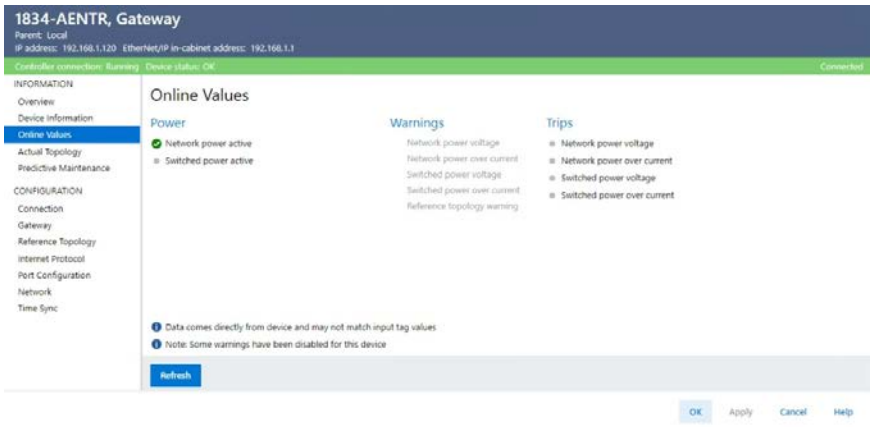
Device Locator

Use this dialog box to define a user-defined period of time to identify a device.

Parameter	Definition
Duration	Select the minute and seconds duration from the drop-down lists. The maximum setting is 4 minutes.
Blink	Click to flash the system status indicator for the selected time period.

Online Values

The 'Online Values' view displays the states for the power supply, warnings, and trips.



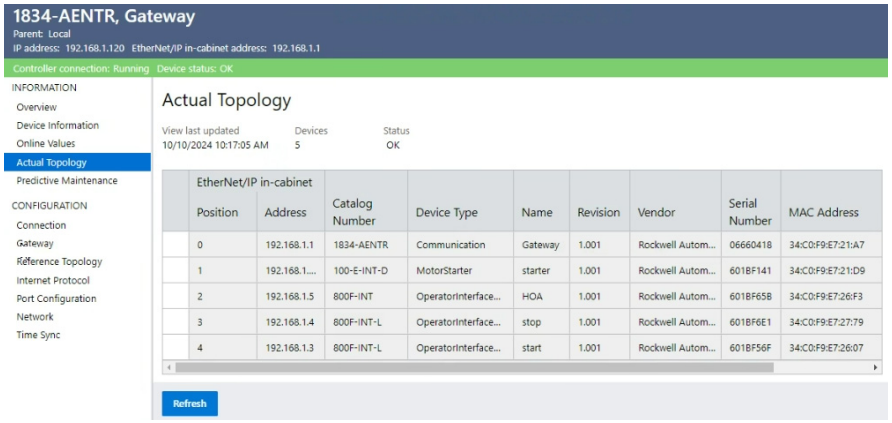
Section	Parameter	Value	
Power	• Network power active • Switch power active		Data read from the device does not indicate active status.
			Data read from the device indicates active status
Warnings	• Network power voltage • Network power over current • Switched power voltage • Switched power over current • Reference topology warning		Data read from the device does not indicate active status.
			Data read from the device indicates a warning condition exists.
Trips	• Network power voltage • Network power over current • Switched power voltage • Switched power over current		Data read from the device indicates a trip condition exists.
			Data read from the device does not indicate active status.

Actual Topology View

After your system is configured, the actual topology view displays information when Logix Designer is online with the controller and the device associated with this profile is reachable within the network. Information that is displayed in the actual topology view includes:

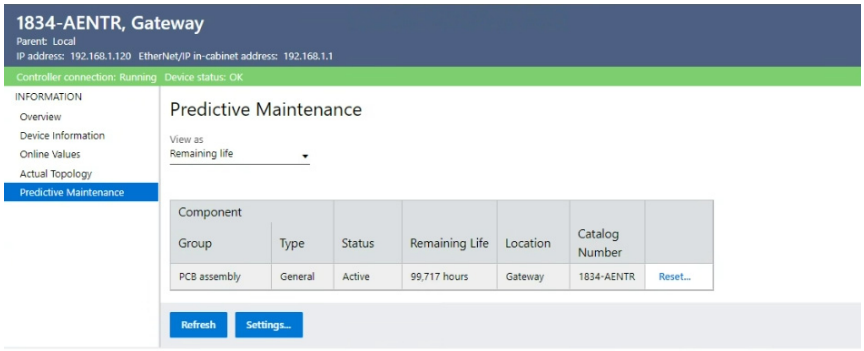
- a list of devices on the EtherNet/IP In-cabinet system network,
- a report of the presence of devices connected to the 1486-CBL flat media cable that are in the controller project, and
- the detail information on the topology.

Each row in the table shows the device identity and network configuration data. The table row number refers to the device position in the network.



Predictive Maintenance

The 'Predictive Maintenance' view displays predictive maintenance data for the 1834-AENTR gateway. Predictive maintenance data is blank when the 1834-AENTR gateway is offline.



Parameter	Option
View as	This is a display filter that displays predictive maintenance data according to the selected option: • remaining life [default], • elapsed life, and • consumed life percentage.
Status	Values are: • Active: Remaining predicted life below threshold is set to 0. • Maintenance required: Remaining predicted life below threshold is set to 1 and predicted remaining life is above 0. • Out of specification: Remaining predicted life below threshold is set to 1 and predicted remaining life is 0 or below 0.
Consumed life percentage	Shows the percentage of the total estimated life that has been consumed.
Location	Identifies the location of the component within a product, device, or subsystem.
Catalog number	Shows the device catalog number.
Reset	Resets the predictive maintenance data.
Settings	Displays the predictive maintenance settings dialog box.
Refresh	Manually refreshes the predictive maintenance data when online with the device.

Predictive Maintenance Settings

The 'Predictive Maintenance' settings displays options to set indicators and messages and configures the alarm for the remaining life threshold percentage.

Parameter	Description
Predicted life	Displays the Maximum life and the Remaining life threshold.
Alarm notification	Enables the remaining life below threshold alarm. If not selected, the alarm is not set even if the alarm threshold is crossed.
Remaining life threshold	Sets the remaining life threshold as the percentage of maximum life. The remaining life varies according to the selected threshold values. Values allowed: • Custom percentage (1) • 15% • 30% • 45% • 5% • 20% • 35% • 50% • 10% [default] • 25% • 40%

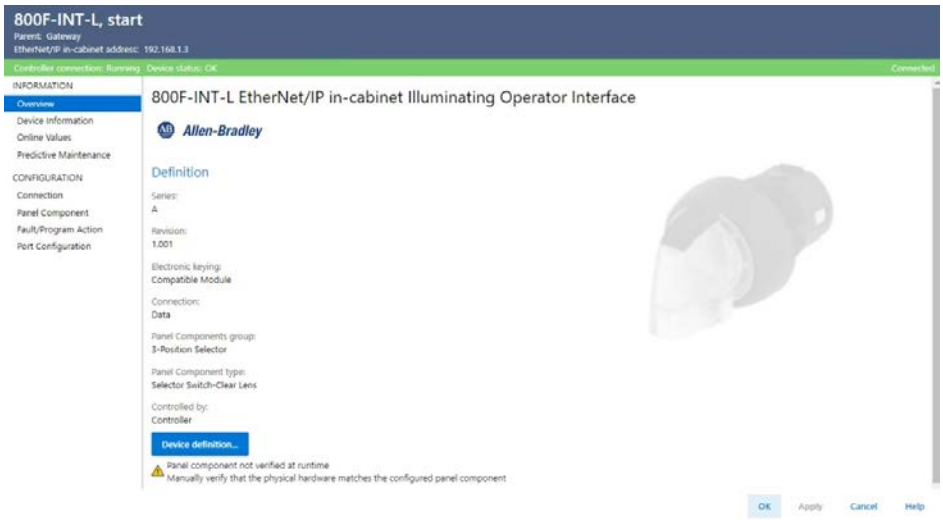
(1) When 'Custom percentage' is selected, provide a value from 0...100% in 0.1% increments for the remaining life threshold.

Monitor a Push Button

When the 1834-AENTR gateway is the selected device within the controller project, the following views are available.

Overview

The Overview displays the current device parameters.

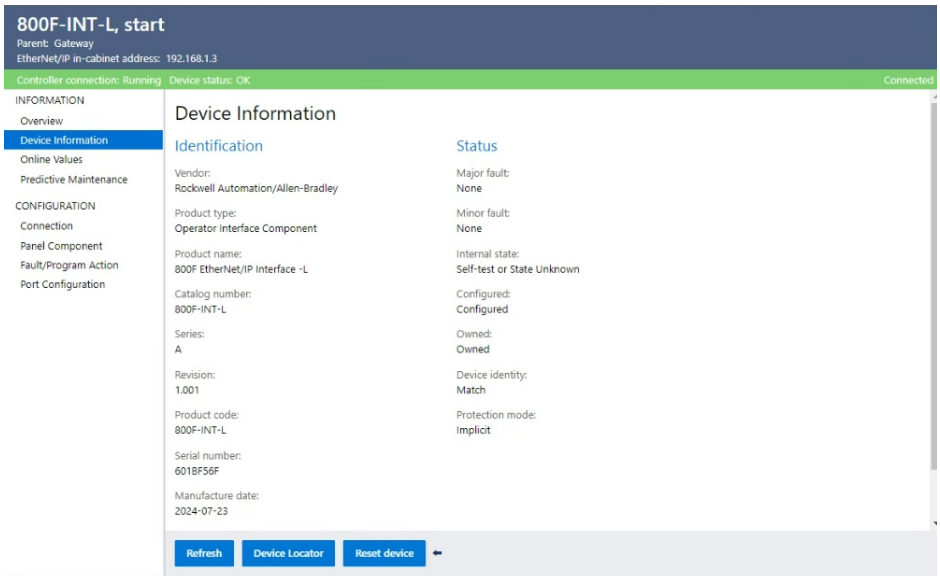


Device Information

The data in the 'Device Information' view comes directly from the device.

When the device is online, use the 'Device Information' view to:

- determine the identity of the device,
- see the current operational state of the device,
- determine whether the device was configured by the owner controller,
- determine whether an owner controller is currently connected to the device,
- retrieve the current status from the device,
- reset the device to its power-up state, and
- see the protection mode of the device, if supported.

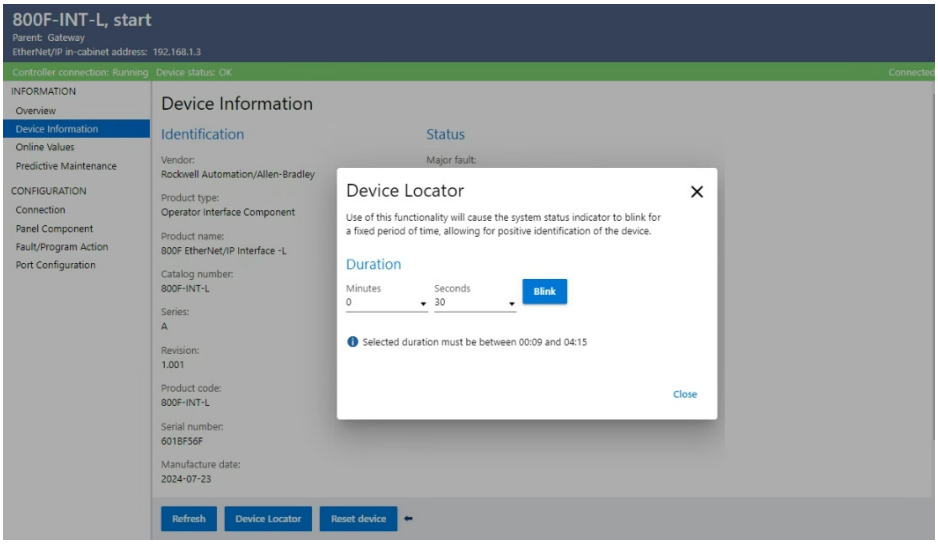


Available actions within this view include:

Parameter	Description
Refresh	Refreshes the 'Device Information' view to show any changes.
Device locator	Opens the 'Device locator' dialog box.
Reset device	Returns the device to its power-up state.

Device Locator Dialog Box

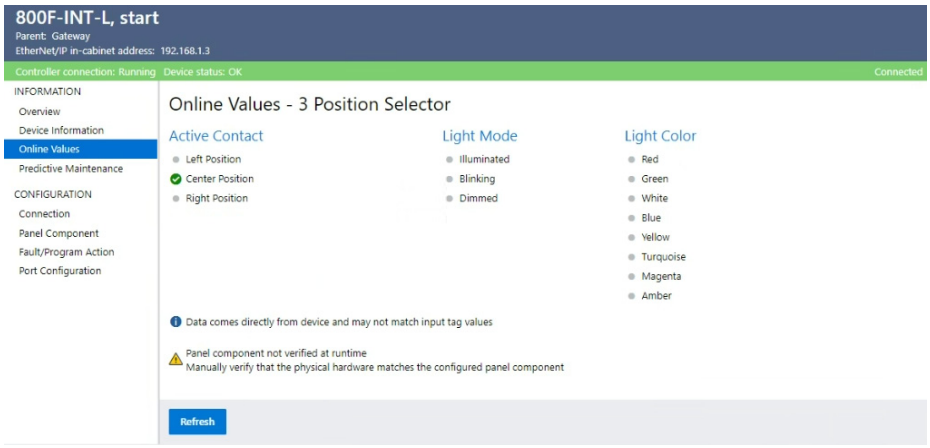
Use this dialog box to define a user-defined period of time to identify a device.



Parameter	Description
Duration	Select the 'Minute' and 'Seconds' durations from the drop-down lists. The maximum setting is four minutes.
Blink	Click 'Blink' to flash the system status indicator for the selected time period.

Online Values

The 'Online Values' view displays the status of your device. The information depends on the type of push button attached.



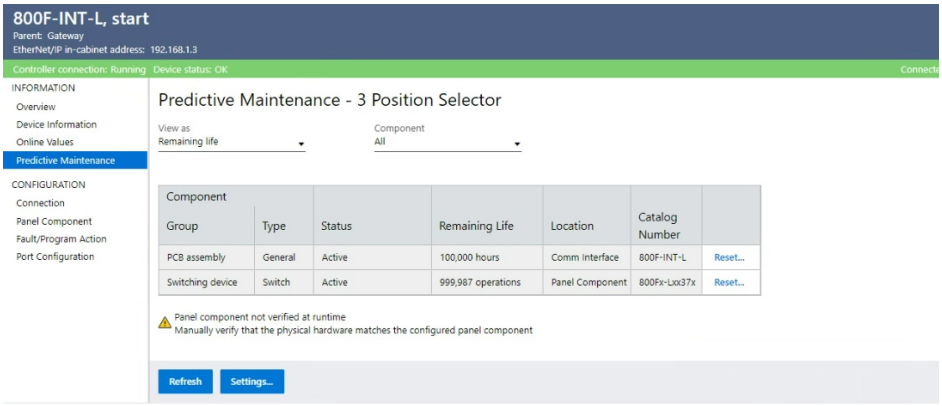
Each value displays a status indicator to show if the device is active or inactive.

Status Indicator	Description
	Indicates the status is inactive for data read from the device.
	Indicates the status is active for data read from the device.

Status Indicator	Description
Active contact	Displays the state of the selected panel component type. **TIP:** There is no active contact parameter for 'Pilot Light'.
Light mode	For an illuminated push button: Displays the state of the panel component light.
Light color	For an illuminated push button: Displays the color of panel component light. The selected panel component type determines which color indicators appear.

Predictive Maintenance View

When the device is online, the 'Predictive Maintenance' view displays predictive maintenance data for the device. The 'Predictive Maintenance' view will be blank if the device is offline.



Parameter	Description	Available Values
View as	Display filter that shows predictive maintenance data according to the selected option.	• Remaining life [default] • Elapsed life • Consumed life percentage
Component	Determines the device component type displayed in the predictive maintenance view, depending on the connected device.	For 800F-INT: • All: Displays data for all device components [default]. • Switching device: Displays data for panel component mechanical operations.
		For 800F-INT-L: • All: Displays data for all device components [default]. • PCB Assembly: Displays data for the RGB LED integrated within the PCB assembly. • Switching device: Displays data for panel component mechanical operations.
Component group	–	When 800F-INT is selected: • Switching device
		When 800F-INT-L is selected: • Switching device • PCB assembly
Type	–	When 800F-INT is selected: • Switch
		When 800F-INT-L is selected: • Switch • General
Status	–	• Active: Remaining predicted life below threshold is set to 0. • Maintenance required: Remaining predicted life below threshold is set to 1 and predicted remaining life is above 0. • Out of specification: Remaining predicted life below threshold is set to 1 and predicted remaining life is 0 or below 0.
Elapsed life/ Remaining life/ Consumed life	Depending on selected view, displays the elapsed life, remaining life, or consumed life percentage in terms of operations for switching device and hours for PCB assembly.	–
Location	–	When 800F-INT is selected: • Panel component
		When 800F-INT-L is selected: • Panel component • Comm Interface
Catalog number	Shows the device catalog number.	–
Reset	Resets the predictive maintenance data.	–
Settings	Displays the predictive maintenance settings dialog box.	See Predictive Maintenance Settings.
Refresh	Manually refreshes the predictive maintenance data when the device is online.	–

Predictive Maintenance Settings

The 'Predictive Maintenance Settings' view displays options to:

- set indicators and messages.
- configure the alarm for the remaining life threshold percentage.

Parameter	Description
Predictive life	Displays the Maximum life and the 'Remaining life' threshold
Alarm notification	Enables the remaining life below threshold alarm. If not selected, the alarm is not set even if the alarm threshold is crossed.
Remaining life threshold	Sets the remaining life threshold as the percentage of maximum life. The remaining life varies according to the selected threshold values. Values include: • Custom percentage (1) • 5% • 10% [default] • 15% • 20% • 25% • 30% • 35% • 40% • 45% • 50%

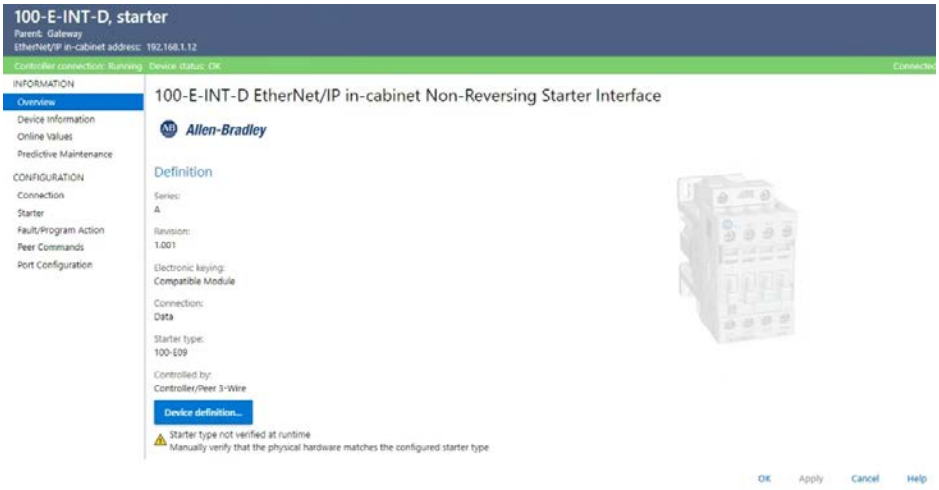
(1) When 'Custom percentage' is selected, provide a value from 0...100% in 0.1% increments for the remaining life threshold.

Monitor a Contactor or Starter

When a contactor or starter is selected as a device within the controller project, the contactor or starter can be monitored.

Overview

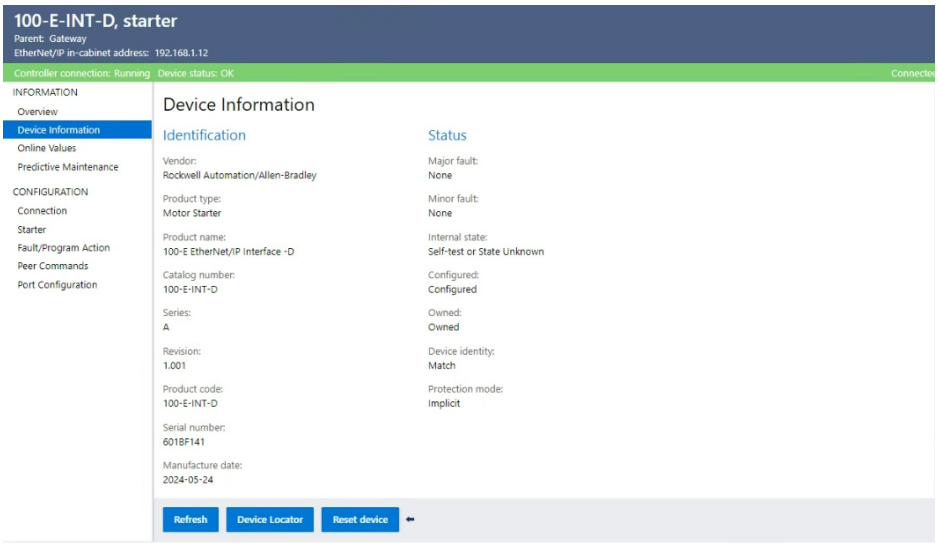
The 'Overview' view displays the current device parameters.



Device Information

When the device is online, use the 'Device Information' view to see the device and status information. In this view you can:

- determine the identity of the device,
- view the current operational state of the device,
- view whether the device was configured by the owner controller,
- view whether an owner controller is currently connected to the device,
- retrieve the current status from the device,
- reset a device to its power-up state, and
- view the protection mode of the device, if supported.

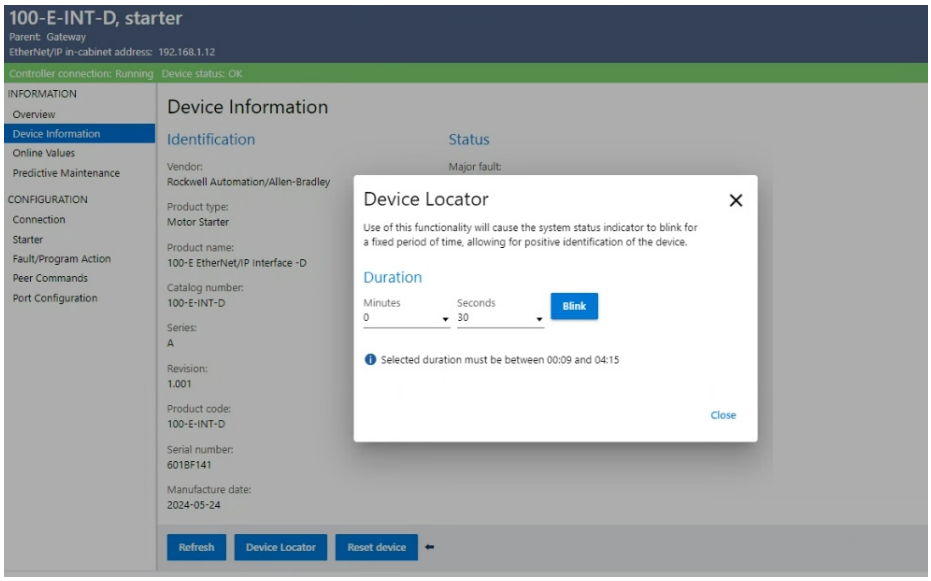


The data in the 'Device Information' view comes directly from the device.

The 'Device Information' view might not be available when the connection is set to 'Listen Only'.

Parameter	Description
Refresh	Refreshes the 'Device Information' view to show any changes.
Device locator	Opens the 'Device locator' dialog box.
Reset device	Returns the device to its power-up state.

Device Locator Dialog

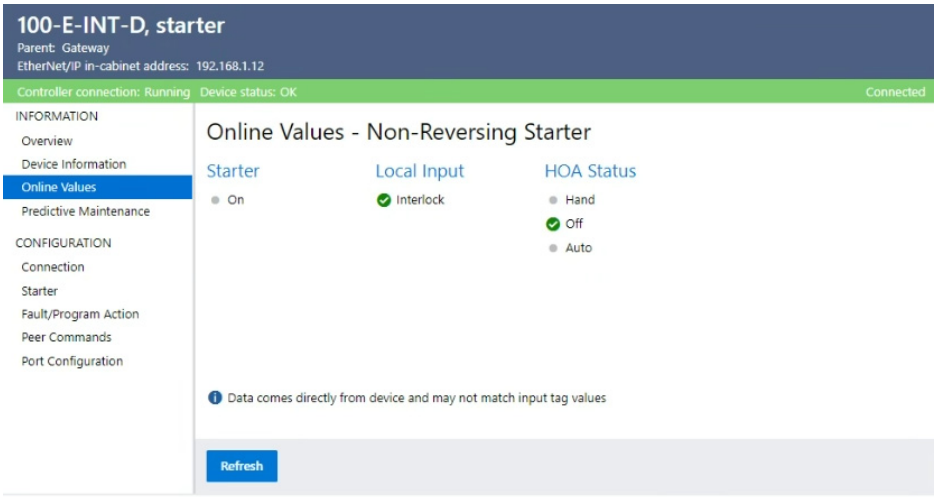


Use this dialog to define a user-defined period of time to identify a device.

Parameter	Description
Duration	Select the 'Minute' and 'Seconds 'durations from the drop-down lists. The maximum setting is 4 minutes.
Blink	Click to flash the system status indicator for the selected time period.

Online Values

The 'Online Values' view displays the states for the device. The information depends on the type of push button attached.



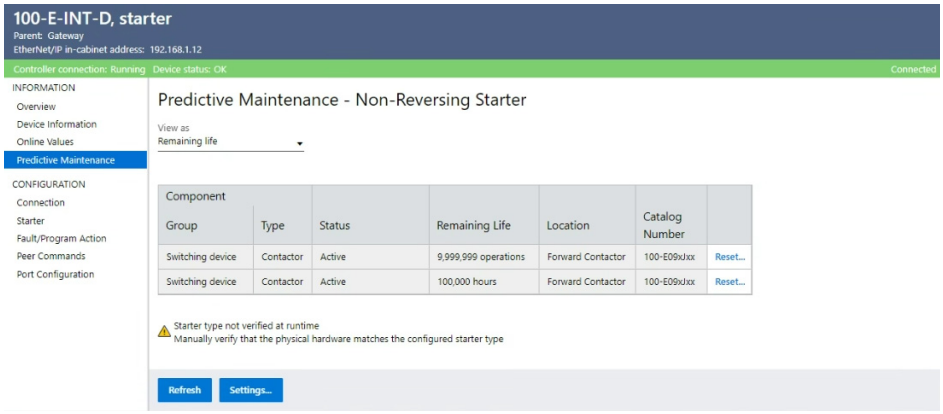
Each value has an indicator to show if it is active or inactive.

Status Indicator	Description
	Indicates the status is inactive for data read from the device. For example, the starter is not active in forward direction.
	Indicates the status is active for data read from the device. For example, the starter is active in forward direction or the interlock is active.
	Indicates an error condition. For example, the interlock signal is inactive.

Device Type	Contactor	Starter	Local Input	HOA Status
100-E-INT Contactor interface	On	Not applicable	Not applicable	• Hand • Off • Auto
100-E-INT-D Non-reversing interface	Not applicable	On	Interlock	• Hand • Off • Auto
104-E-INT-D Reversing interface	Not applicable	Depending on the 'Read' value: • Forward • Reverse	Interlock	• Hand • Off • Auto

Predictive Maintenance

The 'Predictive Maintenance' view displays predictive maintenance data for the device. Predictive maintenance data is blank when the device is offline.



Parameter	Description	Available Values
View as	This is a display filter that displays predictive maintenance data according to the selected option.	• Remaining life [default] • Elapsed life • Consumed life percentage
Status	Provides the current status of the device.	• Active: Remaining predicted life below threshold is set to 0. • Maintenance required: Remaining predicted life below threshold is set to 1 and predicted remaining life is above 0. • Out of specification: Remaining predicted life below threshold is set to 1 and predicted remaining life is 0 or below 0.
Elapsed life/ Remaining life/ Consumed life	Depending on the selected 'View' drop-down, shows the elapsed life, remaining life, or consumed life percentage in terms of operations for switching device and hours for PCB assembly.	–
Location	–	When 100-E is selected: • Panel component • Comm Interface
Catalog number	Shows the device catalog number.	–
Reset	Resets the predictive maintenance data.	–
Settings	Displays the predictive maintenance settings dialog box.	See Predictive Maintenance Settings
Refresh	Manually refreshes the predictive maintenance data when the device is online.	–

Predictive Maintenance Settings

The 'Predictive Maintenance' settings displays options to:

- set indicators and messages.
- configures the alarm for the remaining life threshold percentage.

Parameter	Description
Predicted life	Displays the 'Maximum life' and the 'Remaining life' threshold.
Alarm notification	When selected: Enables the remaining life below threshold alarm. If not selected: Alarm is not set even if the alarm threshold is crossed.
Remaining life threshold	Sets the remaining life threshold as the percentage of 'Maximum life'. The 'Remaining life' varies according to selected threshold values. Values include: • Custom percentage (1) • 5% • 10% [default] • 15% • 20% • 25% • 30% • 35% • 40% • 45% • 50%

(1) When 'Custom percentage' is selected, provide a value from 0...100% in 0.1% increments for the remaining life threshold.

Notes:

Develop Secure Applications

CIP Security

CIP Security™ is a standard, open-source communication mechanism defined by ODVA, Inc. that helps to provide a secure data transport across an EtherNet/IP™ network. CIP Security lets CIP-connected devices authenticate each other before transmitting and receiving data.

CIP Security uses the following security properties to help devices protect themselves from malicious communication:

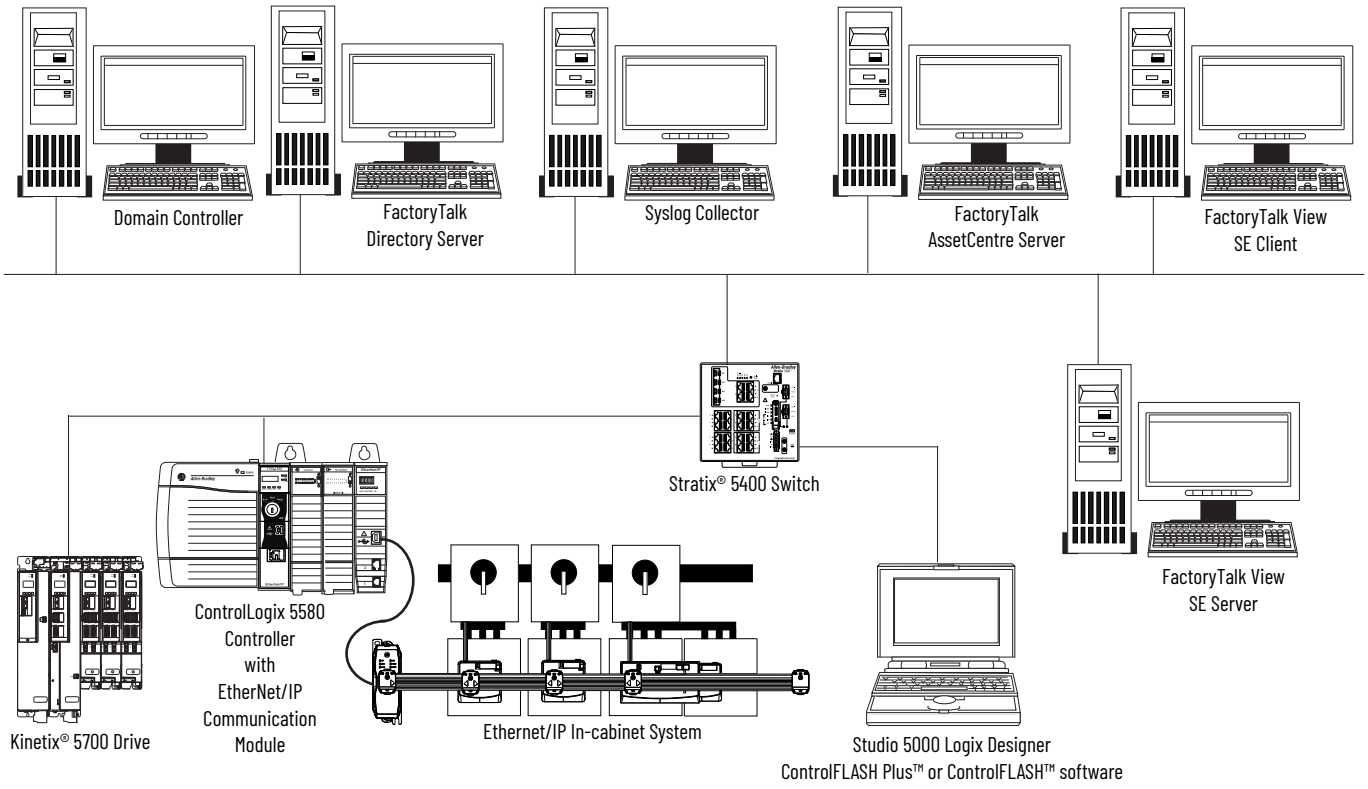
- device identity and authentication,
- data integrity and authentication, and
- data confidentiality.

The following Rockwell Automation software is used to implement CIP Security:

- FactoryTalk® Policy Manager software, version 6.51 or later
  - includes FactoryTalk System Services, version 6.5 or later
- FactoryTalk Linx software, version 6.5 or later
  - allows workstation software communicate securely using CIP Security
- Studio 5000 Logix Designer® application, version 37 or later
  - required to interface with CIP security-enabled Logix controllers

To enhance overall security, integrate your the EtherNet/IP in-cabinet system with the system components shown in the graphic below.

Implement the Control System with Security-focused Products



FactoryTalk Security and FactoryTalk Directory applications allow you to:

- manage user accounts and configure user groups to support the separation of duties and least privileged,
- identify, authenticate, and authorize users, and
- configure strong password requirements.

FactoryTalk AssetCentre application allow you to:

- inventory assets,
- configure and use auditable events,
- manage audit storage capacity,
- manage a diagnostics and health log,
- manage change detection and reporting,
- schedule backups, and
- recover from disruptions if they occur.

We recommend using a Windows® 10 operating system (OS) or higher, to achieve full software functionality.

For additional information to help you develop secure applications, see the publications listed below. You can view or download publications at rok.auto/literature.

Resource	Description
System Security Design Guidelines Reference Manual, SECURE-RM001	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
Converged Plantwide Ethernet (CPwE) Design and Implementation Guide, publication ENET-TD001	Provides network architecture recommendations.
Security Configuration User Manual, publication SECURE-UM001.	Provides Windows infrastructure recommendations (domain controller) and guidance to configure and use these Rockwell Automation products: • FactoryTalk Directory • FactoryTalk Activation Manager • FactoryTalk Security • FactoryTalk AssetCentre
CIP Security with Rockwell Automation Products Application Technique, publication SECURE-AT001	Explains how to configure and use CIP Security with Rockwell Automation products to improve the security of your industrial automation system including the use of FactoryTalk® Policy Manager to define communication between zones.

For a list of CIP security-capable products and publications that describe how to use the products including limitations and considerations, see the following resources:

Resource	Description
CIP Security — The Final Layer of Defense, Securely Connect Your Data and Devices	Provides a list of CIP security-capable products and guidance to securely connect your data and supported devices.
CIP Security with Rockwell Automation Products Application Technique, publication SECURE-AT001	Provides guidance to implement the CIP security standard in your International Association of Classification Societies (IACS).

Automatic Device Configuration

A feature in Studio 5000 software, Automatic Device Configuration (ADC) supports the automatic download of configuration data. ADC is always active in the 1834-AENTR gateway and cannot be disabled. The configuration settings are stored in the Logix controller. With ADC, the Logix controller automatically downloads the configuration settings for a particular 1834-AENTR gateway and associated end node devices each time the Logix controller connects to the 1834-AENTR gateway.

Apply or Remove Security from a Supported Device

The security policy has been developed to so that:

- if the policy model is deployed and the supported device communications were reset, the supported device is constrained by the security policy.
- if the FactoryTalk Policy Manager and FactoryTalk System Services was uninstalled, the security policy configured for the supported device is still in effect.
- you can remove the security policy from the supported device by deleting the supported device from the security policy model. The changes take place during the next deployment.

IMPORTANT The 1834-AENTR gateway should be disabled before the security policy is applied/removed.

IMPORTANT The external systems that access the 1834-AENTR gateway and end node devices should be disabled before applying/removing the security policy.

For complete instructions on applying or removing a security policy to supported devices, see FactoryTalk Policy Manager Getting Results Guide, publication FTALK-GR001.

To apply a security policy to a supported device:

1. Launch FactoryTalk Policy Manager.
2. Add the supported device to a zone.
3. Deploy the security policy.

To remove a security policy from a supported device:

1. Launch FactoryTalk Policy Manager.
2. Remove the supported device from a zone.
3. Re-deploy the security policy.

Perform a Factory Reset for Security Erase

A factory reset clears user-configurable settings such that the data cannot be retrieved with commercially available tools.

1834-AENTR Gateway Factory Reset

The 1834-AENTR gateway can be reset to its factory default using the addressing rotary dials.

1. Set the rotary dials on the side of the 1834-AENTR gateway to position '888'.
2. Apply power to the 1834-AENTR gateway.
3. Wait for the following actions to occur:
   - the 1834-AENTR gateway status indicator to flash red,
   - the network status indicator to stop illuminating, and
   - the link status indicator to stop illuminating.

End Node Device Factory Reset

An end node device can be reset to factory default settings using special commands supported in the 1834-AENTR gateway via FactoryTalk Policy Manager.

IMPORTANT The end node device must be:

- connected to the 1834-AENTR gateway via the 1486-CBL flat media cable and
- 24V DC power must be applied to the 1834-AENTR gateway.

All 1486-CON-P1 flat media connectors on the 1486-CBL flat media cable must have:

- an end node device connected or
- a 1486-CON-D1 dust cover attached.

Follow these steps to reset the end node device to factory default settings.

1. Launch FactoryTalk Policy Manager.
2. Select the end node device to reset.
3. Execute the reset command.

For complete instructions on resetting an end node device, see FactoryTalk Policy Manager Getting Results Guide, publication FTALK-GR001.

Security Eventing

When configured, supported devices for the EtherNet/IP In-cabinet system can generate security events.

To enable or disable a security event for supported devices:

1. Launch FactoryTalk Policy Manager.
2. Update the security eventing settings.
3. Re-deploy the security policy.

For complete instructions on enabling or disabling security eventing to supported devices, see FactoryTalk Policy Manager Getting Results Guide, publication FTALK-GR001.

Protection Modes

There are two protection mode types:

- Implicit protection mode: Available for the 1834-AENTR gateway and all EtherNet/IP In-cabinet supported devices.
- Explicit protection mode: Available for the 1834-AENTR gateway only.

Implicit Protection Mode

Implicit protection mode is a state where the supported device is operational, but has implemented defenses against disruptive changes that would take the product out of service for the process.

This security enhancement occurs on the I/O module level and helps prevent unauthorized configuration changes that can affect system behavior and cause unintended and unforeseen changes.

Implicit protection mode is automatically triggered as soon as one of the following actions occur.

- 1834-AENTR gateway: The 1834-AENTR gateway bridges I/O connections and is a target for I/O connections. This security enhancement helps prevent unauthorized configuration changes that can affect system behavior and cause unintended and unforeseen changes.
- All other EtherNet/IP In-cabinet supported devices: The supported device is a target of I/O connections.

Implicit protection mode is:

- enabled on the supported device as soon as I/O connections are established through the supported device.
- disabled on the supported device as soon as all I/O connections through the supported device are stopped.

When in the implicit protection mode, the supported device rejects the following service requests and returns the error code '0x10 - Device State Conflict':

- reset service to the identity object,
- update services to the NVS Object (supported device firmware updates),
- set services that would change the communication settings and cause a loss of communications to the supported device, and
- CIP explicit messages that would be disruptive to the supported device's current operation.

Restrictions Imposed By Implicit Protection Mode

Implicit protection mode helps prevent access to services that are not required after the supported device is configured and in normal operation. Implicit protection mode disables features that can make the supported device vulnerable to disruptive actions. By doing so, implicit protection mode helps to reduce the attack surface.

IMPORTANT Implicit protection mode is not configurable.

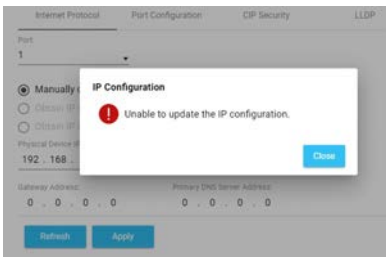
When in implicit protection mode, the supported device helps prevent execution of these tasks:

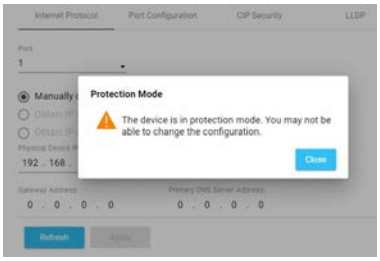
- Change to Ethernet configuration settings, such as port speed.
- Change to IP settings, such as IP address, mask, and DHCP mode.
- Update to the firmware on the supported device.
- Disable or re-enable external product ports.
- Perform remote resets.

If the 1834-AENTR gateway or supported device is in implicit protection mode and you attempt to perform any of the restricted tasks, you are alerted that such a task cannot be performed because the supported device is in implicit protection mode.

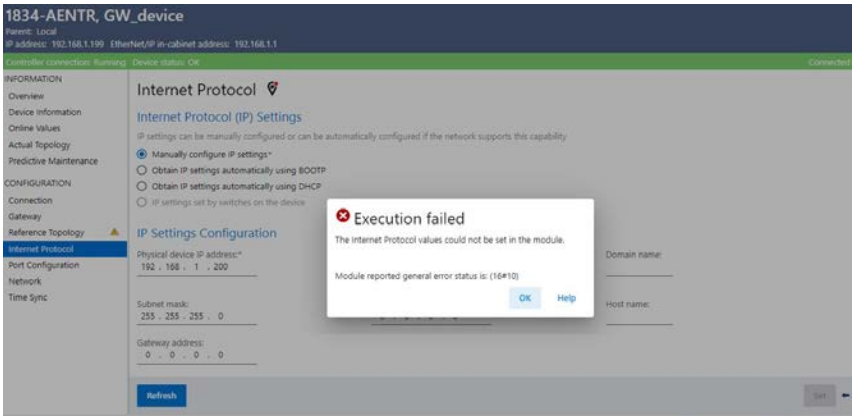
The following are example alerts that result from an attempt to set IP values on a supported device when the supported device is in implicit protection mode:

- End node device protection





- 1834-AENTR gateway



If the supported device is not in implicit protection mode, the supported device does not reject attempts to perform the tasks that are described previously.

For example, after the supported device is initially powered up, but no I/O connections are established yet, the supported device is not in implicit protection mode. You can attempt to update the firmware on the supported devices and the supported device does not reject the attempt.

If the supported device enters implicit protection mode each time the supported device powers up, check the application to determine if there are active I/O connections that are opened via the supported device.

Explicit Protection Mode

When the 1834-AENTR gateway is in the explicit protection mode, the 1834-AENTR gateway does not allow any configuration changes.

While operating in explicit protection mode, the 1834-AENTR gateway rejects any CIP explicit messages that would change the configuration of the module. For example, you cannot change the IP address, speed, or duplex settings when the module had explicit protection mode enabled.

When in explicit protection mode, the 1834-AENTR gateway rejects the following service requests and return the error code '0x10 — Device State Conflict':

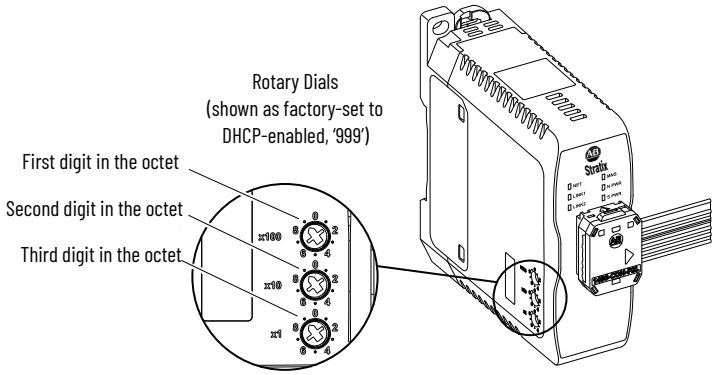
- Reset service to the identity object.
- Update services to the NVS object (update to the firmware on the supported device).
- Set services that would change the communication settings and cause a loss of communications to the supported device.

- Explicit requests to change parameter values/configuration data that is part of the configuration assembly.
- Changes to the reference topology attributes in the EtherNet/IP In-cabinet commissioning object.
- Changes to the predictive maintenance group or component objects.

Enable/Disable the 1834-AENTR Gateway from Protection Modes

While working in protection mode, the supported device rejects any CIP explicit messages that would change the configuration of the supported device. For example, you cannot change the IP address, speed, or duplex settings when the supported device had explicit protection mode enabled.

Follow these steps to enable or disable the module in an explicit protection mode state.



1. Set the rotary switches on the side of the 1834-AENTR gateway.
   - To enable explicit protection mode: Set to position '900'.
   - To disable explicit protection mode: Set to position '000'.
2. Apply power to the 1834-AENTR gateway.

   The 1834-AENTR gateway status indicator will flash red, the network status indicator will stop illuminating, and the link status indicator to will stop illuminating.
3. Remove power to the 1834-AENTR gateway.
4. Set the rotary switches to match the last octet of the IP address.
5. Reapply power to the 1834-AENTR gateway.

Disable Gateway Ethernet Ports

Restrict the use of unnecessary ports, for example disable communication on network port 2 if only network port 1 is needed for application.

IMPORTANT
- Once a port is disabled, you lose any connection that is established through the Ethernet port.
- You cannot disable Ethernet ports if the controller keyswitch is in Run mode or if the FactoryTalk Security settings deny this editing option.

The Ethernet port on the 1834-AENTR gateway can be disabled and re-enabled via FactoryTalk Linx or via explicit messaging.

Disable/Re-enable with FactoryTalk Linx

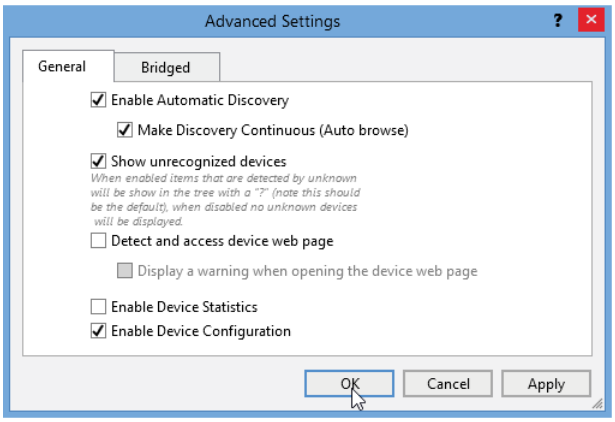
Follow the steps below to disable or re-enable the 1834-AENTR gateway with FactoryTalk Linx.

Disable the Ethernet Port

IMPORTANT	Once an Ethernet port is disabled, it cannot be used with FactoryTalk Linx. So if both ports are disabled, FactoryTalk Linx will not be able to communicate with the unit. The 1834-AENTR gateway will have to be reset to factory default to re-enable communication.

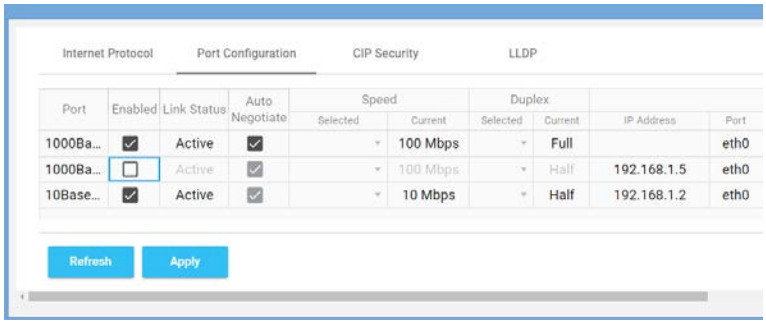
Perform the following steps to disable a port of the 1834-AENTR gateway using FactoryTalk Linx.

1. Launch the FactoryTalk Linx.
2. Create the appropriate EtherNet driver if needed.
3. Identify the IP address for the 1834-AENTR gateway.
4. Navigate to 'Advanced Settings', 'General' tab.



5. Select 'Enable Device Configuration'.
6. Click the 'OK' button.

   This allows the port configuration to be changed using FactoryTalk Linx.
7. Right-click the 1834-AENTR gateway from the left pane.
8. Select 'Device Configuration'.
9. Select the 'Port Configuration' tab.
10. Deselect the check box of the port that you want to disable from the 'Enable' column.



11. Click the 'Apply' button.

Re-enable the Ethernet Port

1. Repeat steps 1...9 from Disable the Ethernet Port on page 74.
2. Select the check box of the port that you want to re-enable from the 'Enable' column.
3. Click the 'Apply' button.

Disable/Re-enable with Explicit Messaging

Follow the steps below to disable or re-enable the 1834-AENTR gateway with explicit messaging.

For more information on explicit messaging, EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001.

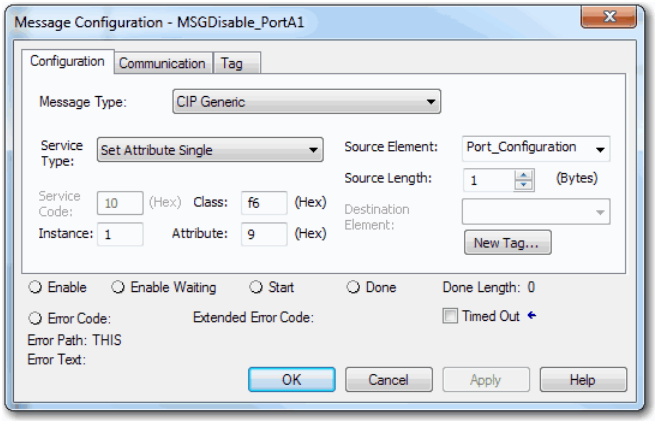
Disable the Ethernet Port

1. Add a messaging (MSG) instruction to your program.

   This message only has to execute once. It does not need to execute with every program scan.

IMPORTANT You cannot add a MSG instruction to your program if the controller keyswitch is in 'Run' mode, or if the FactoryTalk Security settings deny this editing option.

2. Click the 'Configuration tab.



   a. Set the 'Message Type' as 'CIP Generic'.

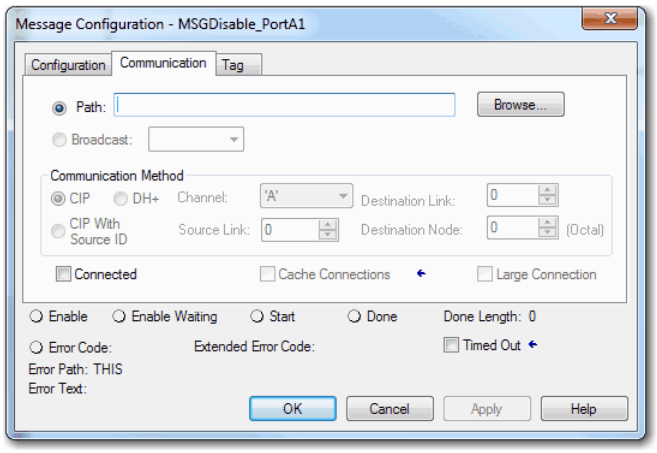
   b. Select or type the following values in the remaining fields:

Field	Value	Description
Service Code	0x10	Set Attribute Single
Class	0xF6	Ethernet Link Object
Instance	1	EtherNet Port 1
	2	EtherNet Port 2
Attribute	9	Admin
Data Type	USINT	0 = Reserve 1 = Enable Interface 2 = Disable Interface

IMPORTANT These values are stored to NVS memory in such a way that the MSG instruction is not required to execute each time the controller powers up.

3. Click the 'Communication' tab.
4. Select a value from the 'Path' field.

IMPORTANT Messages to the value selected must be unconnected messages.



5. Make sure that the 'Source Element' tag value is '2'.
6. Click the 'Apply' button.

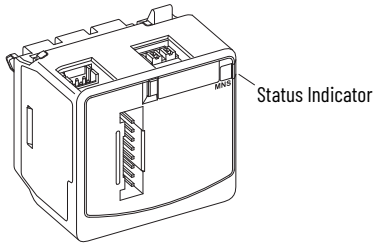
Re-enable the Ethernet Port

1. Repeat steps 1...4 from Disable the Ethernet Port on page 75.
2. Make sure that the 'Source Element' tag value is '1'.
3. Click the 'Apply' button.

Troubleshooting

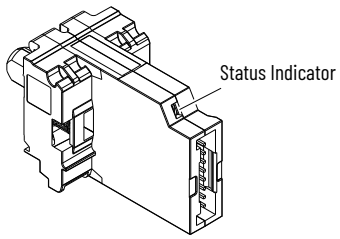
Status Indicators

See the status indicators on your device to identify its current status



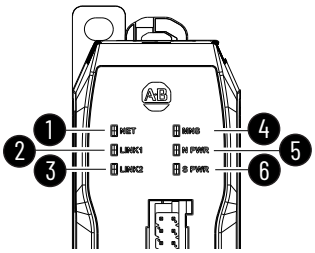
100-E and 104-E Contactor Communication Interface Modules Status Indicators

Status Indicator	Indicator Description	LED Status Color	Status Description
MNS	Module and network status for the device	Off	The device is powered off or powered on, but with no IP address configured.
		Flashing green	The IP address is configured for the device, but there are no connections.
		Steady green	The IP address is configured for the device, at least 1 connection is established, and the bus is operating properly.
		Flashing red	The IP address for the device is configured, but one of the following events has occurred: an I/O connection has timed out, a peer connection has timed out, or a major recoverable fault exists.
		Steady red	A device on the bus has the same IP address, the communication module has become detached from the 100-E / 104-E contactor, or the internal diagnostics has created a non-resettable fault. **IMPORTANT:** If a duplicate IP address fault is not present and the fault persists through power cycles, the device should be replaced.
		Flashing green and red	The device is performing its power-up testing.



800F-INT and 800F-INT-L Communication Interface Modules Status Indicators

Status Indicator	Indicator Description	LED Status Color	Status Description
MNS	Module and network status for the device	Off	The device is powered off or powered on, but no IP address configured.
		Flashing green	The IP address is configured for the device, but there are no connections.
		Steady green	The IP address is configured for the device, at least one connection is established, and the bus is operating properly.
		Flashing red	The IP address for the device is configured, but one of the following events has occurred: an I/O connection has timed out, a peer connection has timed out, the 800F operator has detached, or a major recoverable fault exists.
		Steady red	A device on the bus has the same IP address or the internal diagnostics has created a non-resettable fault. **IMPORTANT:** If a duplicate IP address fault is not present and the fault persists through power cycles, the device should be replaced.
		Flashing green and red	The device is performing its power-up testing.



1834-AENTR Gateway Status Indicators

Note No.	Status Indicator	Indicator Description	LED Status Color	Status Description
1	NET	Network status for the EtherNet/IP network	Off	The 1834-AENTR gateway is powered off or powered on, but no IP address configured.
			Flashing green	An IP address is configured, but no CIP connections are established.
			Steady green	The 1834-AENTR gateway has an IP address, established at least 1 CIP connection, and is operating properly.
			Flashing red	The 1834-AENTR gateway has an IP address but a CIP connection has timed out
			Red	The 1834-AENTR gateway shares an IP address with another device on the network. Change the IP address of the module.
			Flashing green and red	The 1834-AENTR gateway is performing its power-up testing.
2, 3	LINK1, LINK2	Indicates the current state of the module regarding transmission of data	Off	Either the module is not powered on or a cable does not exist on the port.
			Flashing green	Activity exists on the port at 1000 MB or 100 MB.
			Steady green	A 1000 MB or 100 MB link exists on the port, but no traffic is being received.
			Flashing yellow	Activity exists on the port at 10 MB.
			Steady yellow	A 10 MB link exists on the port, but no traffic is being received.
4	MNS	Module and EtherNet/IP In-cabinet network status for the device	Off	IP addresses are not configured on the bus.
			Flashing green	IP addresses are configured on the bus but there are no connections.
			Steady green	IP addresses are configured, at least 1 connection is established, and the bus is operating properly.
			Flashing red	IP addresses are configured but connections have timed out or a major recovery fault has occurred.
			Steady red	A device on the bus has the same IP address or the internal diagnostics has created a non-resettable fault. **IMPORTANT:** If a duplicate IP address fault is not present and the fault persists through power cycles, the device should be replaced.
			Flashing green and red	The device is performing its power-up testing.
5	N PWR	24V DC network power Network power for the EtherNet/IP communication	Off	No power is supplied to the 1834-AENTR gateway.
			Steady green	The power supply is operating correctly.
			Steady red	The power supply in a tripped state.
			Flashing red	The power supply is in a warning state.
			Flashing red and green	The power supply not tripped, but the output is off.
6	S PWR	24V DC switched power Switched power for component control	Off	Power is supplied to the 1834-AENTR gateway.
			Steady green	The power supply is operating correctly.
			Steady red	The power supply in a tripped state.
			Flashing red	The power supply is in a warning state.

Automatic Diagnostic Messages

Automatic diagnostics is a system-level feature that provides device diagnostics to human machine interfaces (HMIs) and other clients, with zero programming. The diagnostics include device description conditions and state events. Automatic diagnostics is enabled by default.

You can disable and enable the whole feature while online or offline from the 'Advanced' tab on the 'Controller Properties' dialog. You can also disable automatic diagnostics for a specific device in the device's configuration. The following tables list the automatic diagnostics messages for each device type.

100-E and 104-E Contactor Communication Interface Module

Display Code	Display Text
MOD-FLT	Module is faulted
NODE-INTFLT	Device has an internal fault
PC-PEERFLT	Peer-to-peer (P2P) communication is faulted

800F-INT and 800F-INT-L Communication Interface Modules for 800F Operators

Display Code	Display Text
MOD-FLT	Module is faulted
NODE-INTFLT	Device has an internal fault
PC-PEERFLT	Peer-to-peer (P2P) communication is faulted
PC-ND	Panel component not detected

1834-AENTR Gateway

Display Code	Display Text
NODE-INTFLT	Device has an internal fault
NP-VFLT	Network power has a voltage trip condition
NP-OVCR	Network power has an over current condition
SP-VFLT	Switched power has a voltage trip condition
SP-OVCR	Switched power has an over current condition

Notes:

Configure Message Instruction

Overview

A message (MSG) instruction is used to transfer data that does not require continuous updates. You can use it to configure and monitor the parameters/attributes of a dependent device on the EtherNet/IP In-cabinet system network.

IMPORTANT	Do not use a MSG instruction for any safety-related function.

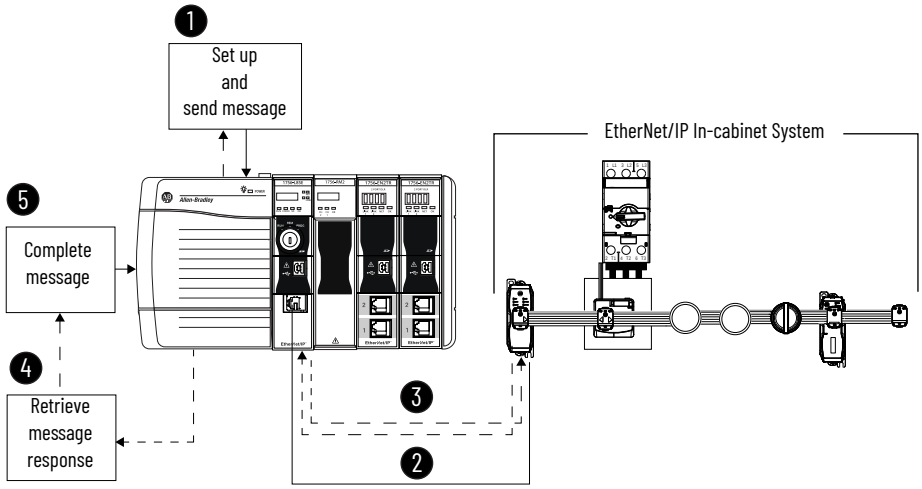
Before you can configure an MSG instruction, you must create a tag with the MESSAGE data type to use in your logic program.

The MSG instruction handles all messaging that is initiated by a Logix Designer program. It automatically creates and manages TCP connections and CIP encapsulation sessions.

- For details on how to use MSG instructions, see Logix 5000 Controllers Messages Programming Manual, publication 1756-PM012.
- For more detail on MSG instruction and controller tags for the EtherNet/IP In-cabinet system, see the EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001.

Message Process

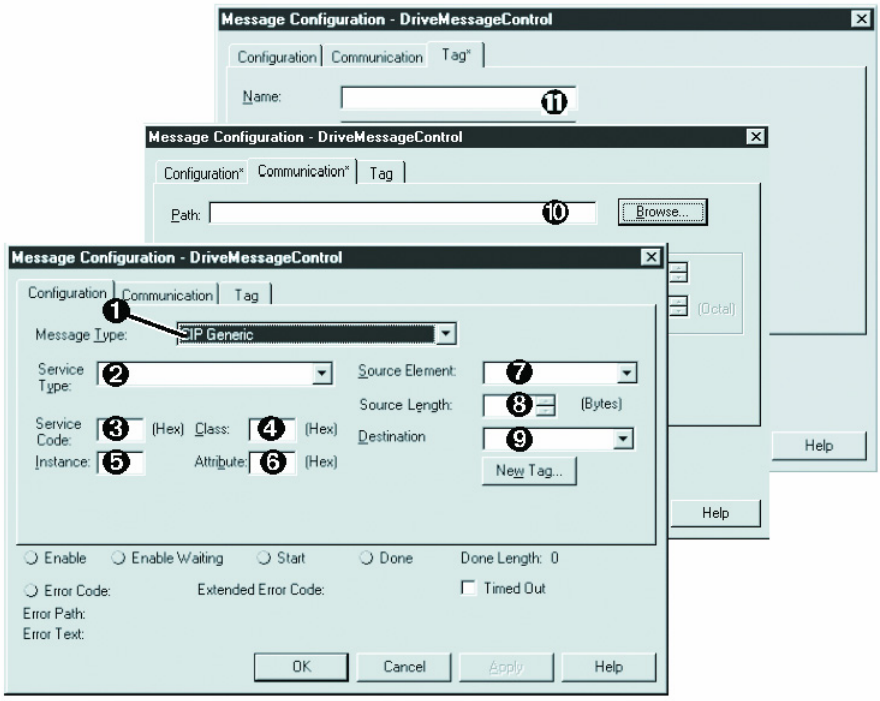
The figure and table below explains the message process



Note No.	Description
1	Format the required data and configure the ladder logic program to send a message request to the scanner or bridge module (download).
2	The scanner or bridge module transmits the message request to the dependent device over the EtherNet/IP network.
3	The dependent device transmits the message response back to the scanner; the data is stored in the scanner buffer.
4	The controller retrieves the Message Response from the buffer of the scanner (upload).
5	The message is complete.

The details of each step vary depending on the controller. See the product documentation for your controller.

ControlLogix Message Format in Studio 5000



For more detail on explicit messaging for the EtherNet/IP In-cabinet system, see the EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001.

Note No.	Field	Description
1	Message Type	The message type is usually CIP Generic.
2	Service Type	The service type indicates the service (for example, Get Attribute Single or Set Attribute Single) that you want to perform.
3	Service Code	The service code is the code for the requested EtherNet/IP service. This value changes based on the Service Type that has been selected. In most cases, this is a read-only box. If you select "Custom" in the Service Type box, then you must specify a service code in this box.
4	Class	The class is an EtherNet/IP class.
5	Instance	The instance is an instance (or object) of an EtherNet/IP class.
6	Attribute	The attribute is a class or instance attribute.
7	Source Element	This box contains the name of the tag for any service data to be sent from the scanner or bridge to the module and drive.
8	Source Length	This box contains the number of bytes of service data to be sent in the message.
9	Destination	This box contains the name of the tag that receives service response data from the module and drive.
10	Path	The path is the route that the message follows. **TIP:** Click **Browse** to find the path or type in the name of a module that you previously mapped.
11	Name	The name for the message.

Use Explicit Messaging

Use the data in the table below to create a MSG instruction to the 1834-AENTR gateway.

Parameter	Value	Description
Service Code	0x4C	Reset_End_Node_Request
Class	0x110	In-cabinet actual topology object
Instance	1	–
Attribute	–	–
Data Type	UINT	Physical position of the end node device on the 1486-CBL flat media cable, '1'...'39'. '0' can be used to reset all end node devices on the 1486-CBL flat media cable

For more detail on explicit messaging for the EtherNet/IP In-cabinet system, see the EtherNet/IP In-cabinet System Reference Data, publication 1834-RD001.

Example: Read elapsed life for a 100-E Motor Starter (Motor Starts)

To obtain the number of operations (forward actuations) for a 100-E motor starter connected on the network, predictive maintenance data can be viewed within each device via their add-on profile. Each add-on profile provides the following data:

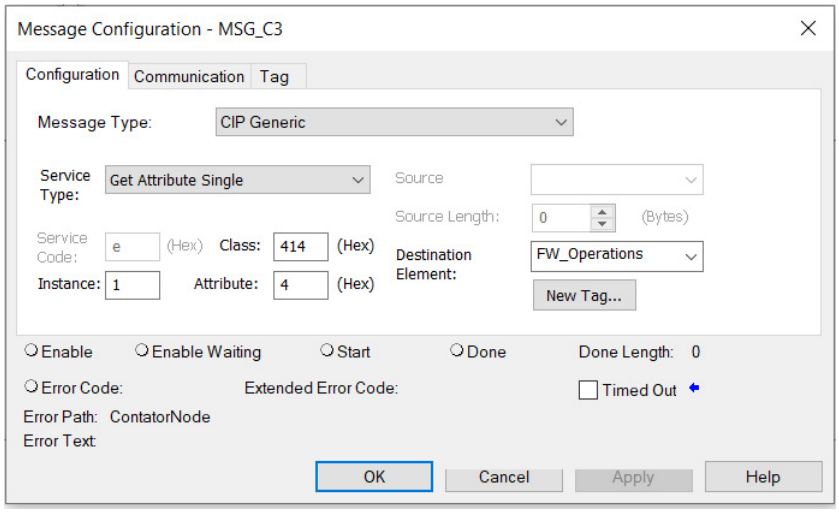
- remaining life
- elapsed life, and
- consumed life percentages.

Actual elapsed life data can be viewed through an explicit message instruction.

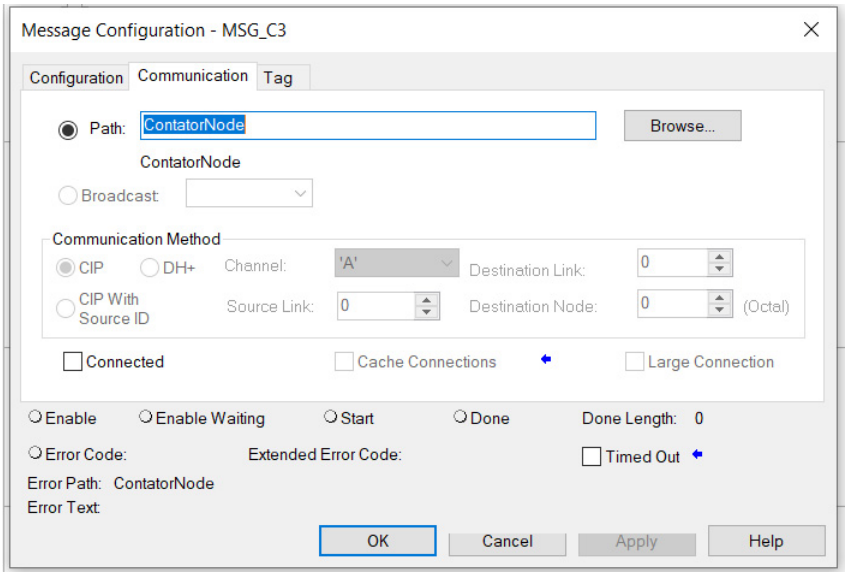
Class, Instance, and Attribute Values for Elapsed Life

Parameter	Value	Description
Service code	0x0E	Get attribute single
Class	0x414	Predictive maintenance component object
Instance	1	–
Attribute	4	Elapsed life
Data Type	UDINT	Number of operations

Message Configuration – Configuration Tab



Message Configuration — Communication Tab



Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800

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