

EtherNet/IP Modules

Catalog Numbers 1756-ENBT, 1756-EN2F, 1756-EN2T, 1756-EN2TR, 1756-EN2TXT, 1756-EN2TRXT, 1756-EN2TSC, 1756-EN3TR, 1756-EWEB, 1768-ENBT, 1768-EWEB



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.

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

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



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.

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).

This manual contains new and updated information. Changes throughout this revision are marked by change bars, as shown to the right of this paragraph.

New and Updated Information

This table contains the changes made in this revision.

Topic	Page
Added the Set the Network IP Address chapter.	47

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This manual describes how to install and start up EtherNet/IP module systems with Logix5000™ controllers.

Use this manual if you program applications that use an EtherNet/IP network with one of these Logix5000 controllers:

- CompactLogix™
- ControlLogix®

You should also understand the following:

- Networking concepts
- How to the use Studio 5000™ environment
- How to use RSLinx® Classic programming software

Studio 5000 Environment

The Studio 5000 Engineering and Design Environment combines engineering and design elements into a common environment. The first element in the Studio 5000 environment is the Logix Designer application. The Logix Designer application is the rebranding of RSLogix™ 5000 software and continues to be the product to program Logix5000 controllers for discrete, process, batch, motion, safety, and drive-based solutions.



The Studio 5000 environment is the foundation for the future of Rockwell Automation® engineering design tools and capabilities. This environment is the one place for design engineers to develop all of the elements of their control system.

Download the Add-on Profiles and Firmware

If a module has a later firmware revision for the communication module than recognized in the most current version of the Logix Designer application, you need to download the Add-on Profile (AOP) for the communication module so it can be recognized in the Controller Organizer.

Complete these steps to download and install an AOP.

1. Go to the Rockwell Automation Web site at <http://www.rockwellautomation.com/>.
2. From the Support tab, choose Product Compatibility & Download Center.




3. On the Get Downloads tab, click Find Product Downloads.
4. Enter the catalog number and click Go.

Start by selecting products



5. Select the module from the list then click the Find Downloads button at the bottom of the Selections tab.

6. Click the download graphic .

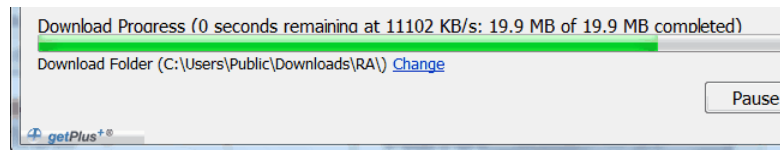
The Available Downloads window opens.

7. From the bulleted list, choose the firmware name.

The End User License Agreement opens.

8. Review the agreement and click I Agree.

The Rockwell Automation Download Manager opens and the download begins. The location of the downloaded file is shown under the progress bar.



9. When the downloaded is complete, click Close.
10. Locate the downloaded .zip file and extract it to a temporary directory.
11. Install the file.
 - Use the ControlFLASH™ software to install the firmware, or

- Shut down any instances of the Logix Designer application that are currently running.
- In the temporary directory, double-click the MPSetup.exe file and follow the on-screen instructions to install the AOP.

Enable the Web Pages

The adapter's web pages are disabled by default and are disabled when the adapter is returned to the factory default settings. Complete these steps to enable the web pages.

1. Set the rotary switches to 000.
2. Apply power to the adapter.
The MOD LED flashes red and the module is inoperable.
3. Set the rotary switches to a valid IP address (not 000 or 888).
4. Cycle power to the adapter.

When the module completes powerup, the web pages are enabled and can be accessed by entering the module's IP address into a Web browser.

The Configuration pages (Device Identity, Network Configuration and Device Services) are password protected. By default they can be accessed with:

- Username = administrator
- Password = the adapter's serial number (listed on the adapter's home page)

If the above procedure is performed while the web pages are already enabled, they continue to be enabled and the password is reset to the adapter's serial number.

Disable Web Pages

The adapter's web pages can be disabled using the check box on the Device Services page in the Configuration folder.



Device-level Ring Network

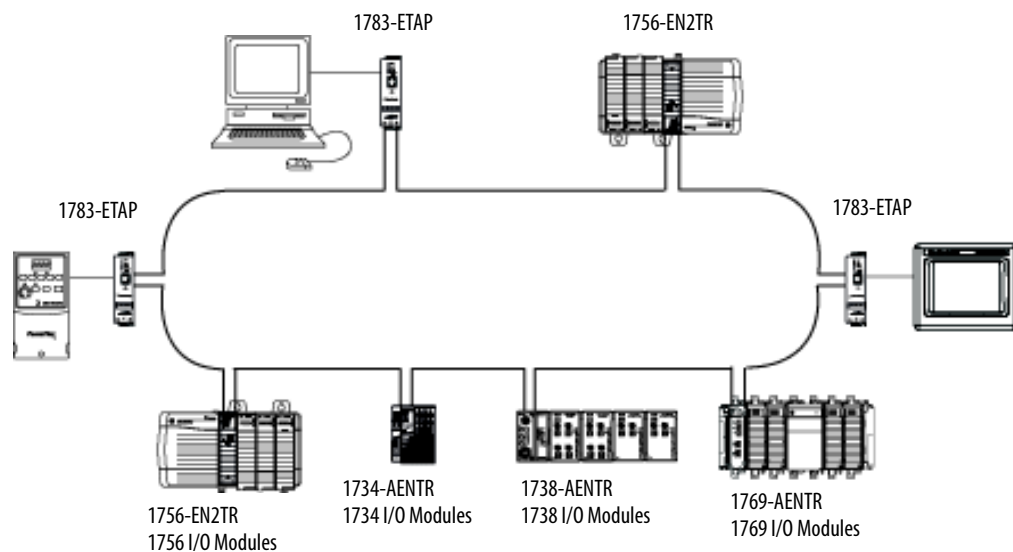
A device-level ring (DLR) network is a single-fault-tolerant ring network intended for the interconnection of automation devices without the need for additional switches. The ring topology offers these advantages:

- Media redundancy
- Fast network fault detection and reconfiguration
- Resiliency of a single-fault-tolerant network
- Easy implementation without additional hardware requirements

IMPORTANT This section summarizes a DLR network. For information on planning, configuring, and monitoring DLR networks, see EtherNet/IP Embedded Switch Technology Application Guide, publication [ENET-AP005](#).

A single DLR network can support as many as 50 nodes. A DLR network supports copper connections (maximum of 100 m), fiber-optic connections (maximum of 2 km), or a mix of copper and fiber.

Figure 1 - Example Device-level Ring Topology



Check your device specifications to determine whether the device supports the DLR network and whether the device can act as a supervisor.

A DLR network is made up of the following nodes.

Node	Description
Supervisor Node	<p>A DLR network requires at least one node to be configured as ring supervisor.</p> <p>Important: Out of the box, the supervisor-capable devices have their supervisor function disabled so they are ready to participate in a linear/star network or as a ring node on a DLR network.</p> <p>In a DLR network, you must configure at least one of the supervisor-capable devices as the ring supervisor before physically connecting the ring. If you do not, the DLR network will not function correctly and can cause network problems.</p> <p>The ring supervisor provides these main functions:</p> <ul style="list-style-type: none"> • Manages traffic on the DLR network • Collects diagnostic information for the network <p>We recommend that you do the following:</p> <ul style="list-style-type: none"> • Configure at least one back-up supervisor. • Configure the desired active ring supervisor with a numerically higher precedence value as compared to the back-up supervisors. • Keep track of the DLR network's supervisor-precedence values for all supervisor-enabled nodes.
Ring Node	<p>A ring node is any node that operates on the network to process data that is transmitted over the network or to pass on the data to the next node on the network. When a fault occurs on the DLR network, the ring nodes reconfigure themselves and relearn the network topology. Additionally, ring nodes can report fault locations to the active ring supervisor.</p>

Additional Resources

For more information on the products described in this publication, use these resources.

Resource	Description
Ethernet Design Considerations Reference Manual, publication ENET-RM002	Provides details about how to use EtherNet/IP communication modules with Logix5000 controllers and communicate with other devices on the EtherNet/IP network.
EtherNet/IP Secure Communication User Manual, publication ENET-UM003	Provides information on system architecture, configuring secure communication, and diagnostics.
EtherNet/IP Network Configuration User Manual, publication ENET-UM001	Describes how you can use EtherNet/IP communication modules with your Logix5000 controller and communicate with various devices on the Ethernet network.
EtherNet/IP Embedded Switch Technology Application Guide, publication ENET-AP005	Provides details about how to install, configure, and maintain linear and Device-level Ring (DLR) networks by using Rockwell Automation EtherNet/IP devices equipped with embedded switch technology.
Troubleshoot EtherNet/IP Networks ENET-AT003	Provides details about how to verify IP addresses and evaluate EtherNet/IP parameters that can help isolate network issues
EtherNet/IP Media Planning and Installation Manual	Provides details about how to use the required media components and how to plan for, install, verify, troubleshoot, and certify your EtherNet/IP network.
This manual is available from the Open DeviceNet Vendor Association (ODVA) at: http://www.odva.org .	

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

Notes:

Install a 1756 EtherNet/IP Communication Module

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ATTENTION: Environment and Enclosure

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This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment. It 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 can contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional installation requirements
- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures

North American Hazardous Location Approval

<p>The following information applies when operating this equipment in hazardous locations.</p>	<p>Informations sur l'utilisation de cet équipement en environnements dangereux.</p>
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.</p>	<p>Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>
<div style="display: flex; align-items: center;">  <div> <p>WARNING: EXPLOSION HAZARD</p> <ul style="list-style-type: none"> Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. Substitution of components may impair suitability for Class I, Division 2. If this product contains batteries, they must only be changed in an area known to be nonhazardous. </div> </div>	<div style="display: flex; align-items: center;">  <div> <p>AVERTISSEMENT: RISQUE D'EXPLOSION –</p> <ul style="list-style-type: none"> Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. S'assurer que l'environnement est classé non dangereux avant de changer les piles. </div> </div>

European Hazardous Location Approval

The following applies when the product bears the Ex Marking.

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in Zone 2 potentially explosive atmospheres, given in Annex II to this Directive.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.



WARNING: Special Conditions for Safe Use

- This equipment shall be mounted in an ATEX Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in EN 60529) and used in an environment of not more than Pollution Degree 2 (as defined in EN 60664-1) when applied in Zone 2 environments. The enclosure must be accessible only by the use of a tool.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- The USB port is intended for temporary local programming purposes only and not intended for permanent connection and do not use the USB port in hazardous locations.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the rated voltage when applied in Zone 2 environments.
- This equipment must be used only with ATEX-certified Rockwell Automation backplanes.
- The instructions in the user manual shall be observed.



ATTENTION: Prevent Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, 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.



ATTENTION: This equipment is not resistant to sunlight or other sources of UV radiation.

Installation Summary

Follow these steps to install a communication module in a 1756 ControlLogix chassis.

1. [Install the Module.](#)
2. [Determine Module Slot Location.](#)
3. [Install the Module.](#)
4. [Connect the Module to an EtherNet/IP Network via an RJ45 Connection.](#)
or
[Connect the Module to an EtherNet/IP Network via a Fiber Connector.](#)
5. [Connect to the Module via the USB Port.](#)
6. [Apply Chassis Power and Check Status Indicators.](#)
7. [Install or Remove the Module Under Power.](#) - Optional

If needed, see [Download the Add-on Profiles and Firmware on page 7.](#)

Grounding Considerations

The grounding and bonding must be of equal potential between all devices in the communication coverage area.

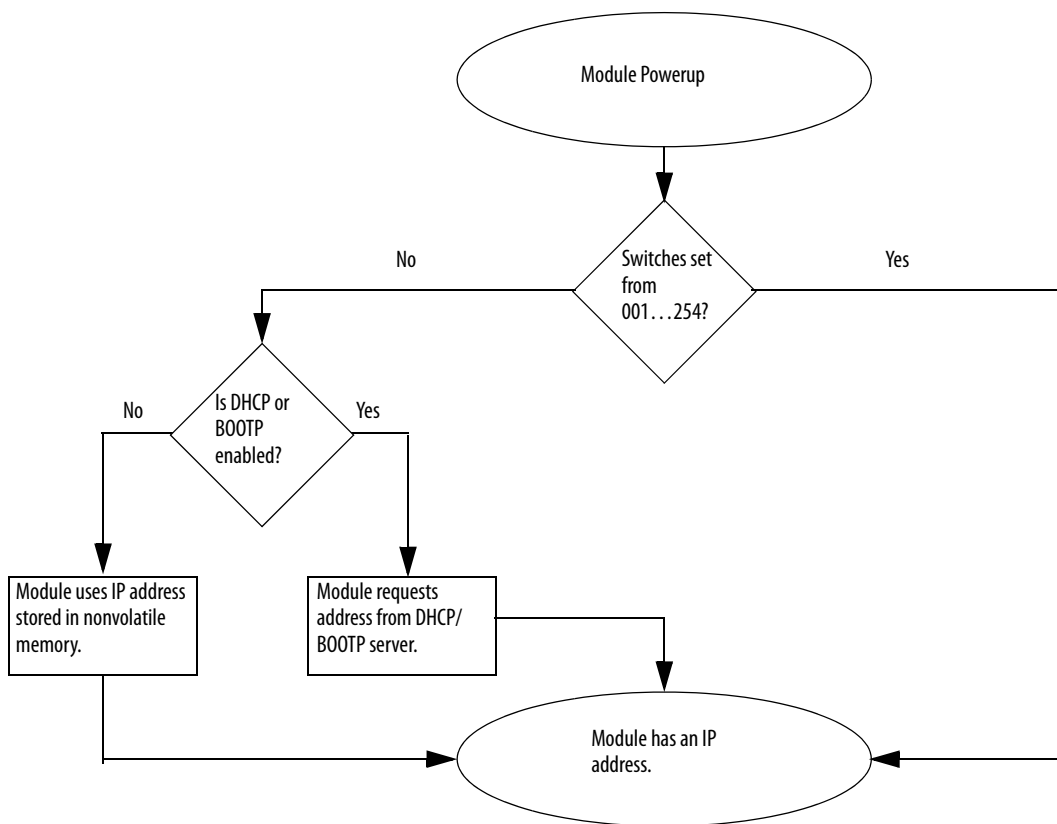


ATTENTION: If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment can be impaired.

Set the Network IP Address on a Module

To operate an EtherNet/IP communication module on an EtherNet/IP network, you must set a network IP address.

Figure 2 - How Your Module's IP Address Is Set

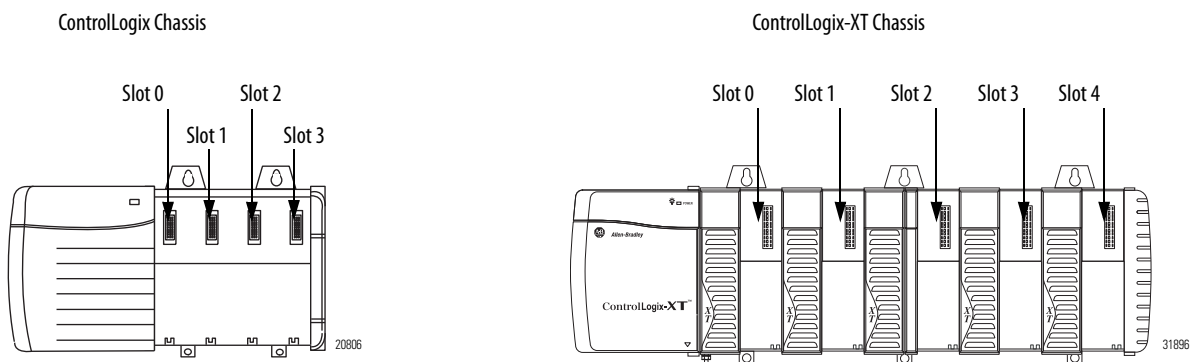


Refer to [Set the Network IP Address on page 47](#) to view all steps for setting the IP address.

Determine Module Slot Location

Install the communication module in any slot in a ControlLogix or ControlLogix-XT™ chassis. You can install multiple communication modules in the same chassis.

This example shows chassis slot numbering in a 4-slot ControlLogix chassis and a 5-slot ControlLogix-XT chassis. Slot 0 is the first slot and is always the leftmost slot in the chassis.



Install the Module

Follow these steps to install the module.



WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

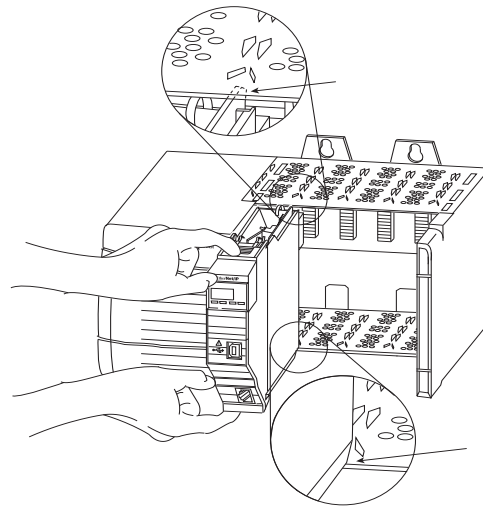
Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts can create electrical resistance that can affect module operation.



ATTENTION: Use caution when handling the module. One side of the module is a heat sink and can be very hot.

IMPORTANT Your module will resemble one of the modules shown in the illustrations. Note that the extreme temperature (XT) versions of the modules are not shown in the illustrations.

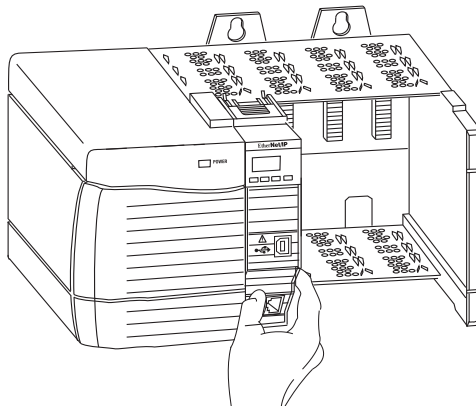
8. Align the circuit board with top and bottom guides in the chassis.



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9. Slide the module into the chassis.

Make sure the module backplane connector properly connects to the chassis backplane. Note that the module is properly installed when it is flush with the power supply or other installed modules.

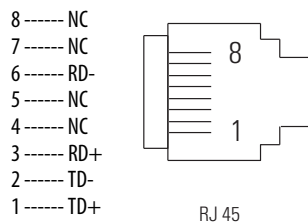


Wire the Module

Use the following information to wire the module.

Connect the Module to an EtherNet/IP Network via an RJ45 Connection

Wire the RJ45 connector as shown.



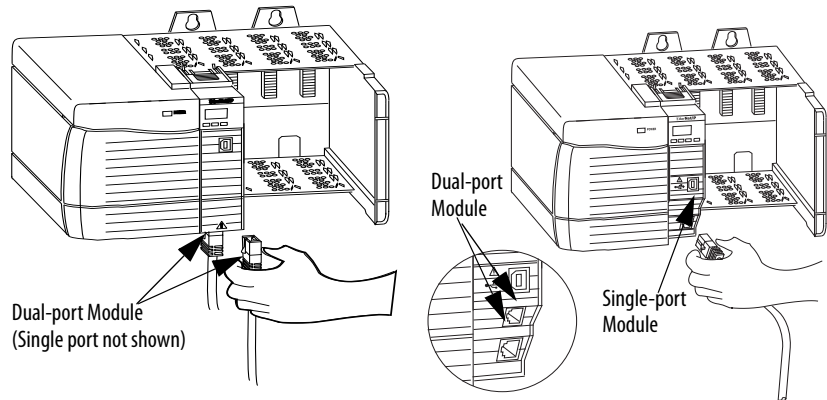
Follow these steps to connect the module to the network.



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

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

1. Attach the cable with the RJ45 connector to the Ethernet port on the module as shown.



2. Attach the other end of the cable to the devices in your network.

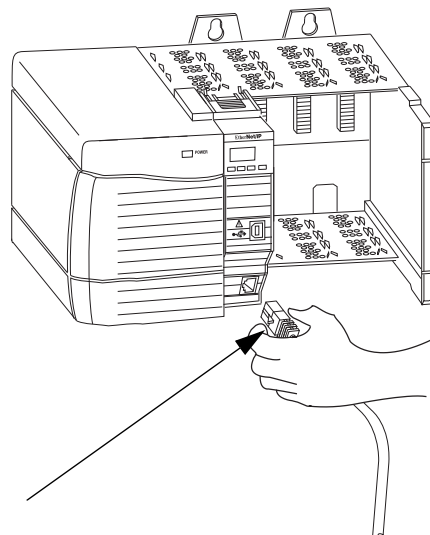
Connect the Module to an EtherNet/IP Network via a Fiber Connector

Attach the LC2 multi-mode fiber cable to the Ethernet port on the bottom of the module as shown.



ATTENTION: Do not look directly into the optical port. Under certain conditions, viewing the optical port can expose the eye to hazard. When viewed under some conditions, the optical port can expose the eye beyond the maximum permissible exposure recommendations.

Class 1 laser product. Laser radiation is present when the system is open and interlocks bypassed. Only trained and qualified personnel should be allowed to install, replace, or service this equipment.



Connect to the Module via the USB Port



WARNING: Do not use the USB port in hazardous locations.



ATTENTION: The USB port is intended for temporary local programming purposes only and not intended for permanent connection. The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs. The USB cable can be ordered from Rockwell Automation, catalog number 9300-USBCBL-ABHR.

If the module has a USB port, is it a series B receptacle. To use the USB port, you must have RSLinx Classic software, version 2.55 or later, installed on your computer.

Use a USB cable to connect your computer to the USB port. You can download programs to controllers and configure Ethernet modules directly from your computer over a USB connection.

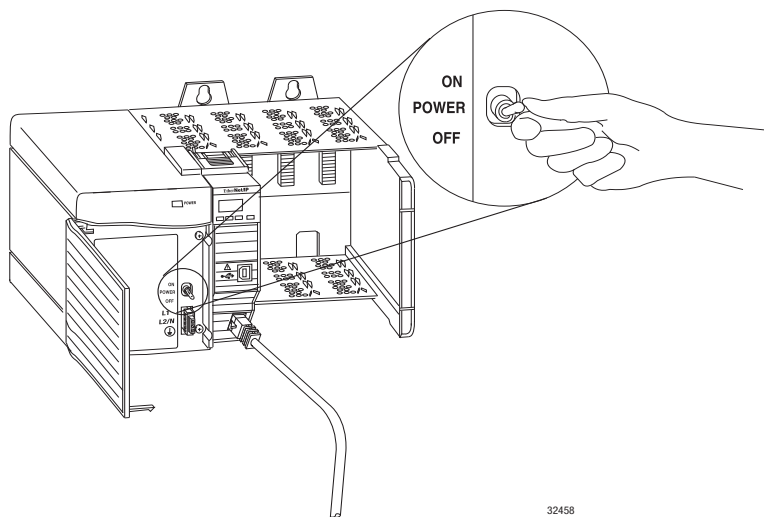
For more information about USB setup and configuration, see Chapter 6, [USB Communication on page 61](#).

Apply Chassis Power and Check Status Indicators

Before you apply power, you must install and connect a ControlLogix chassis and power supply.

Follow these steps to apply power.

1. Flip the switch to the ON position.



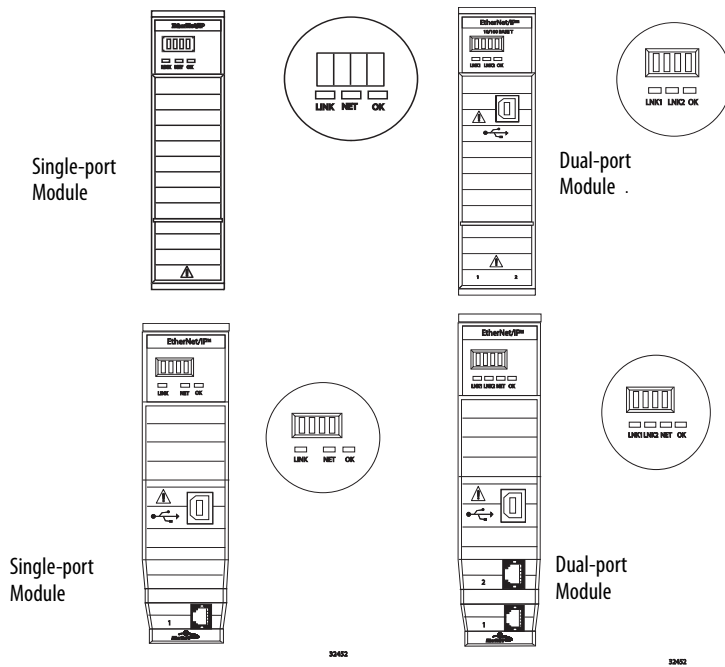
32458

2. Check the power supply and module status indicators and alphanumeric display to determine that the power supply and module are operating properly.

The alphanumeric display should cycle through the following states: TEST - PASS - OK - REV *x.x*, where *x.x* is the module's firmware revision.

The display then alternates between OK and port link status for both ports.

This graphic shows the front of the module for these modules (extended-temperature versions [catalog numbers 1756-EN2TXT and 1756-EN2TRXT] not shown).



Install or Remove the Module Under Power

You can install or remove this module while chassis power is applied.



WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

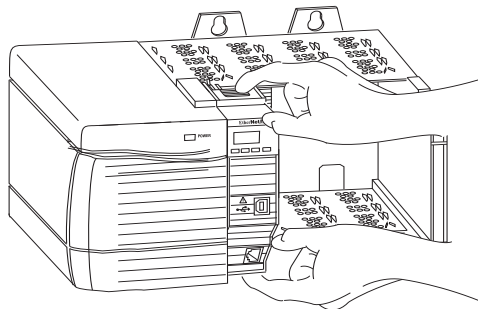
Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts can create electrical resistance that can affect module operation.



ATTENTION: Although the module is designed to support RIUP, when you remove or insert the module with field-side power applied, unintended machine motion or loss of process control can occur. Exercise extreme caution when using this feature.

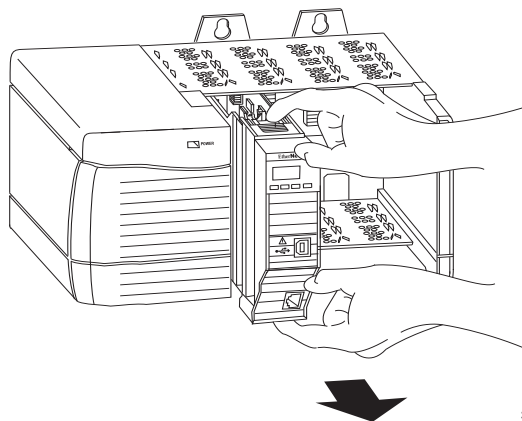
Follow these steps to remove or replace the module.

1. Push on the upper and lower module tabs to disengage them.



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2. Slide the module out of the chassis.



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IMPORTANT If you want to replace an existing module with an identical one, and you want to resume identical system operation, you must install the new module in the same slot and assign the same network configuration.

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Install a 1768 EtherNet/IP Communication Module

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North American Hazardous Location Approval

<p>The following information applies when operating this equipment in hazardous locations.</p>	<p>Informations sur l'utilisation de cet équipement en environnements dangereux.</p>
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.</p>	<p>Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>
<div style="display: flex; align-items: center;">  <div> <p>WARNING: EXPLOSION HAZARD</p> <ul style="list-style-type: none"> • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous. </div> </div>	<div style="display: flex; align-items: center;">  <div> <p>AVERTISSEMENT: RISQUE D'EXPLOSION</p> <ul style="list-style-type: none"> • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles. </div> </div>

European Hazardous Location Approval

The following applies when the product bears the Ex Marking.

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC and has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in Zone 2 potentially explosive atmospheres, given in Annex II to this Directive.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-15 and EN 60079-0.



ATTENTION: This equipment is not resistant to sunlight or other sources of UV radiation.

WARNING:

- This equipment shall be mounted in an ATEX certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in IEC60529) and used in an environment of not more than Pollution Degree 2 (as defined in IEC 60664-1) when applied in Zone 2 environments. The enclosure must utilize a tool removable cover or door.
- This equipment shall be used within its specified ratings defined by Rockwell Automation.
- Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the rated voltage when applied in Zone 2 environments.
- Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.



ATTENTION: Prevent Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, 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.

Installation Summary

Follow these steps to install a communication module in a 1768 CompactLogix system.

1. [Set the Network IP Address.](#)
2. [Install the Module.](#)
3. [Connect the Module to an EtherNet/IP Network via an RJ45 Connection.](#)
4. [Apply Chassis Power and Check Status Indicators.](#)
5. [Remove the Module.](#) - Optional

If needed, see [Download the Add-on Profiles and Firmware on page 7.](#)

Grounding Considerations

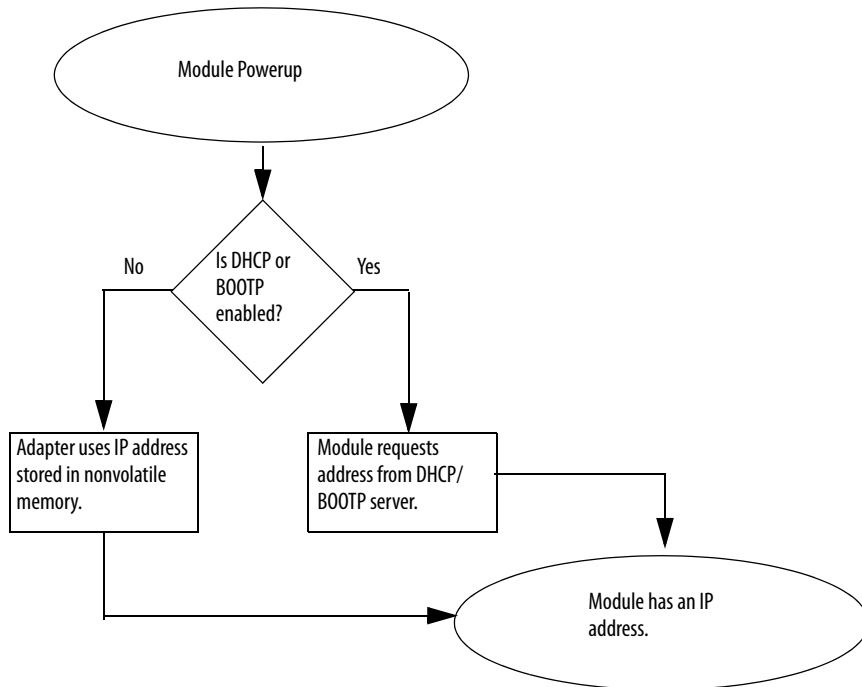


ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.87 in.) and use end-anchors appropriately.

Set the Network IP Address

To operate an EtherNet/IP communication module on an EtherNet/IP network, you must set a network IP address. This graphic shows the process used to set your module's IP address.

Figure 3 - How Your Module's IP Address is Set



Refer to [Set the Network IP Address on page 47](#) to view all steps for setting the IP address.

Install the Module Follow these steps to install the module.

Mount the Module with Screws

IMPORTANT Do not use screws and DIN rail to mount the modules. It is possible to break the mounting tabs off if you screw the modules to the panel while they are on the DIN rail.

Complete these steps to install the module with screws.

1. Use the modules as a template and mark pilot holes on your panel.
2. Drill the pilot holes for M4 or #8 screws.
3. Use M4 or #8 screws to mount the modules to your panel, by using 1.16 N•m (10 lb•in) of torque.
4. Ground the module on a ground bus with a dedicated earth ground stake.
5. Connect the ground bus to a functional earth ground on the DIN rail or panel.

Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional information.

Mount on a DIN Rail

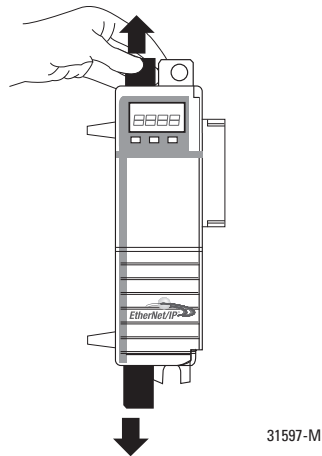
Follow these steps to install the module on a DIN rail.

1. Mount the DIN rail in a suitable location.

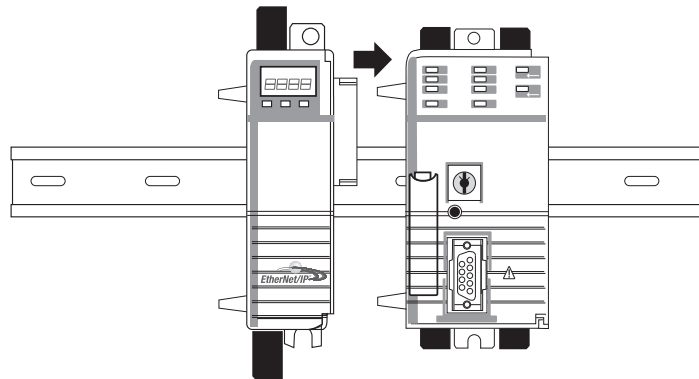


ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.87 in.) and use end-anchors appropriately.

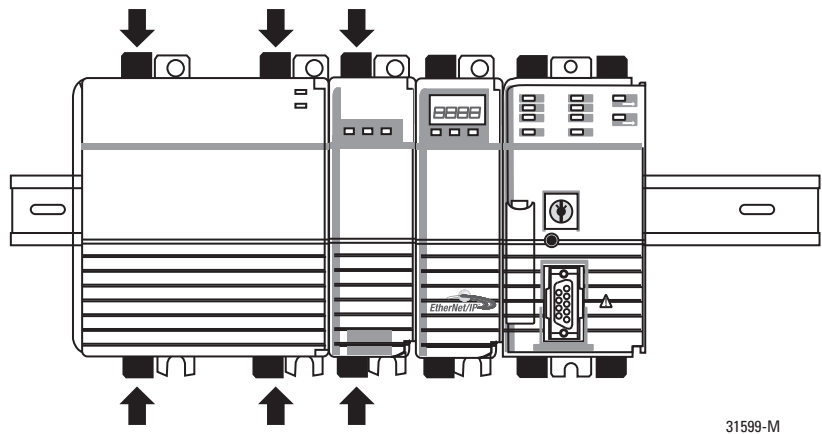
2. Open the DIN rail latches on the module.



3. Align and press the module onto the DIN rail to the left of the controller.
4. Slide the module snugly against the controller.



5. Mount the 1768 power supply and additional 1768 modules to the left of the controller.
6. Close the DIN rail latches.



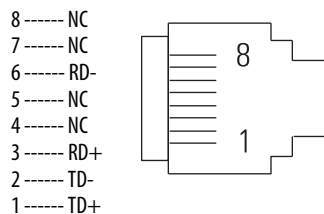
In this example, the 1768 EtherNet/IP communication module is installed in slot 1 and the 1768 CompactLogix controller is installed in slot 0.

Wire the Module

Use the following information to wire the module.

Connect the Module to an EtherNet/IP Network via an RJ45 Connection

Wire the RJ45 connector as shown.



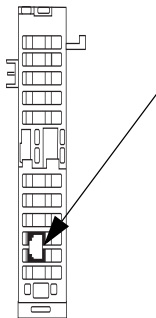
Follow these steps to connect the module to the network.



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

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

1. Attach the cable with the RJ45 connector to the Ethernet port on the bottom of the module as shown.



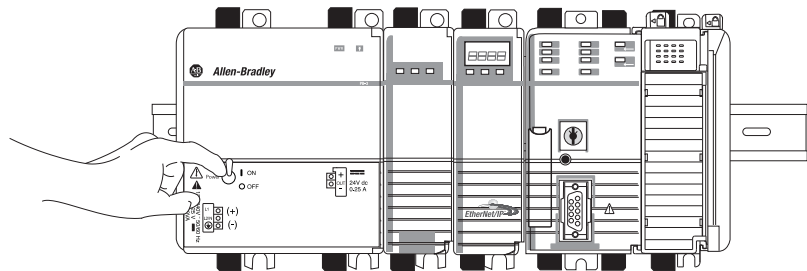
2. Attach the other end of the cable to the devices in your network.

Apply Chassis Power and Check Status Indicators

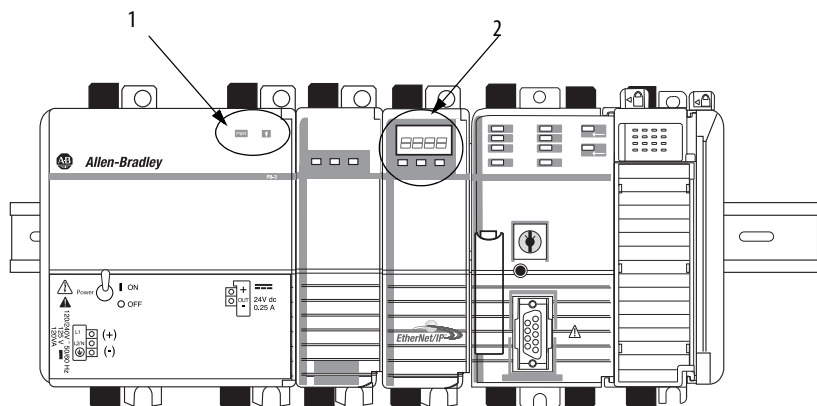
Before you apply power, you must install and mount a CompactLogix controller and Compact I/O™ power supply on the DIN rail.

Follow these steps to apply power.

1. Flip the switch to the ON position.



2. Check the power supply (1) and module (2) status indicators and alphanumeric display to determine that the power supply and module are operating properly.



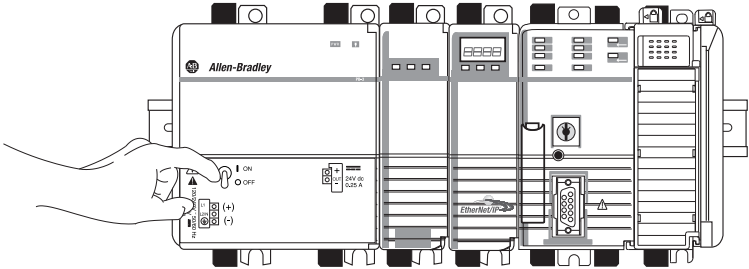
Remove the Module

Follow these steps to remove the communication module.

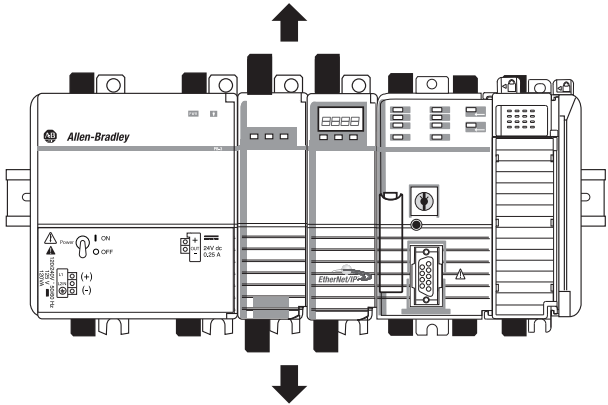
IMPORTANT When you turn the CompactLogix power supply off, make sure you wait for all status indicators on the power supply and controller to turn off before disconnecting any part from the system.

If you disconnect the CompactLogix system while the controller is still writing its program to memory, the program write is not completed and your program is lost.

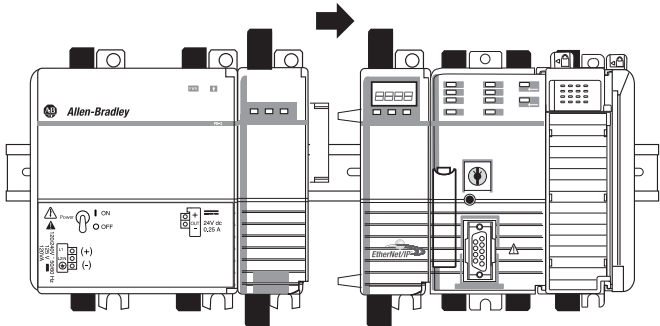
- 1. Flip the switch to the OFF position.



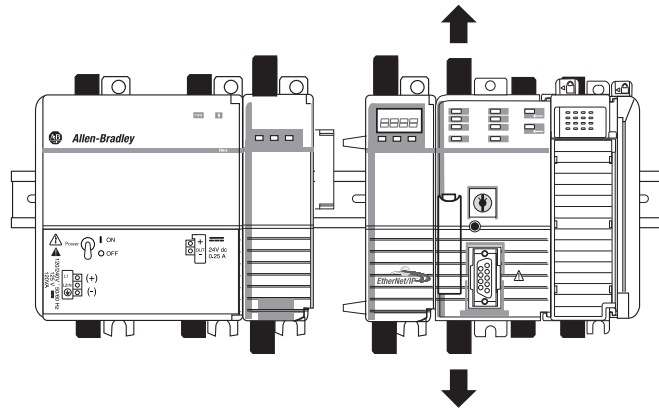
- 2. Open the DIN rail latches of the communication module and the module directly to the left of communication module.



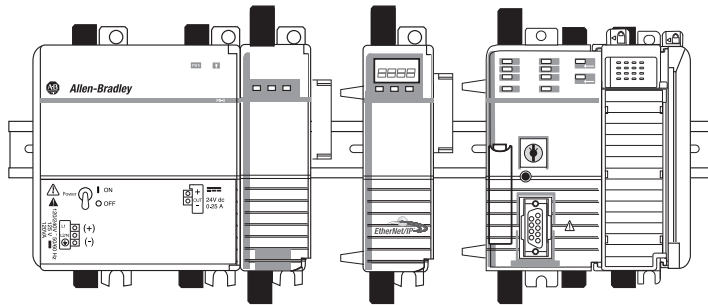
- 3. Slide the communication module and other modules to the right.



4. Open the DIN rail latches of the controller.



5. Slide the controller and other modules away from the communication module.



6. Pull the communication module off the DIN rail.

Install a 1769 EtherNet/IP Adapter

Topic	Page
System Configuration	37
Installation Summary	39
Set the Network IP Address	39
Install the Adapter in a 1769 System	41
Wire the Adapter	45
Remove or Replace the Adapter	45



ATTENTION: Environment and Enclosure

This equipment 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.



This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment. It 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.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional installation requirements.
- NEMA 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

North American Hazardous Location Approval

<p>The following information applies when operating this equipment in hazardous locations.</p>		<p>Informations sur l'utilisation de cet équipement en environnements dangereux.</p>	
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.</p>		<p>Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>	
	<p>WARNING: EXPLOSION HAZARD</p> <ul style="list-style-type: none"> Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. Substitution of components may impair suitability for Class I, Division 2. If this product contains batteries, they must only be changed in an area known to be nonhazardous. 		<p>WARNING: RISQUE D'EXPLOSION</p> <ul style="list-style-type: none"> Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. S'assurer que l'environnement est classé non dangereux avant de changer les piles.



ATTENTION: Prevent Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, 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.



WARNING: When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.

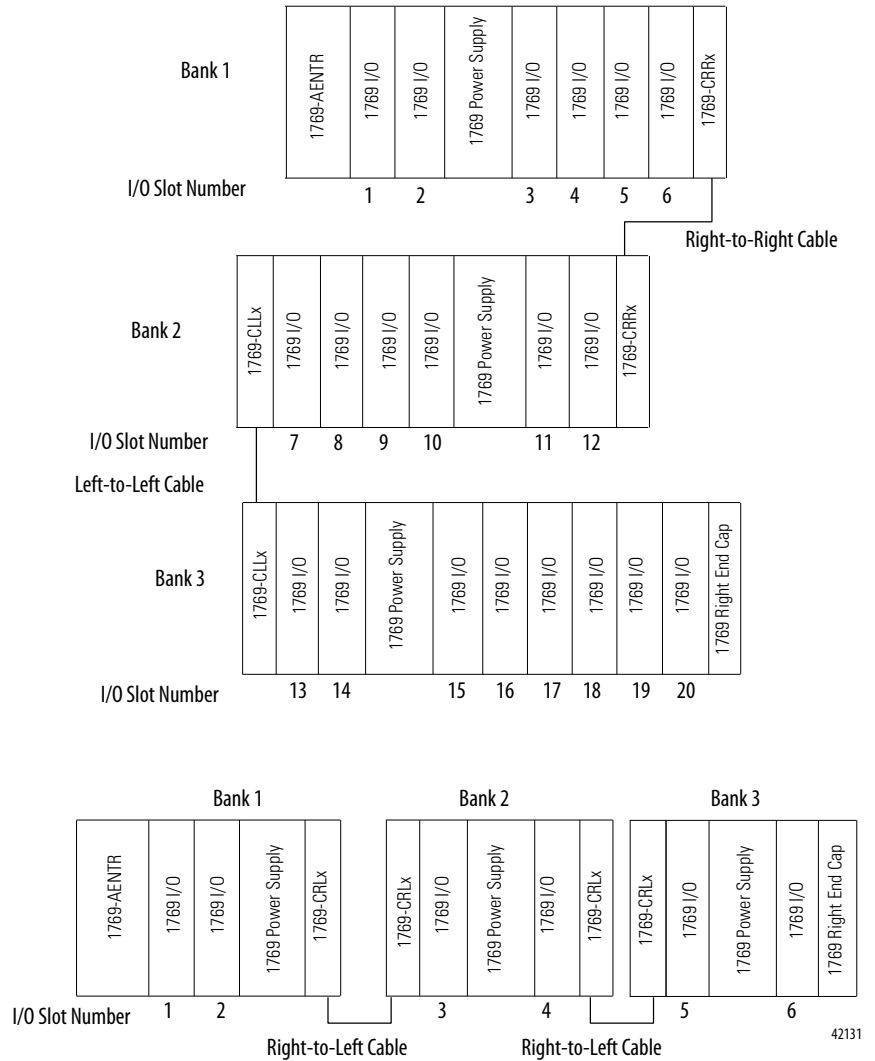
System Configuration

Follow these rules when planning your system configuration.

- The adapter must be the first and left-most module in the system (the first module of Bank 1). Refer to page [38](#) for an example configuration.
- The adapter can communicate with up to 30 modules in a system distributed across three I/O banks.
- An end cap/terminator must be on the last I/O bank.
- Each bank of I/O must have its own power supply.
- A bank of I/O can have a maximum of 16 modules with a maximum of eight on either side of the power supply, depending upon module loading on the supply.
- A 1769 I/O power supply has limits in the amount of 5V DC and 24V DC current it can supply to the modules in its I/O bank. These limits depend on the catalog number (for example, 1769-PA2) of the supply. A bank of modules should not exceed the current limits of the I/O bank power supply. Refer to the Compact 1769 Expansion I/O Power Supplies Installation Instructions, publication [1769-IN028](#).
- The maximum amount of current the system supports in one direction (either side of the power supply) is: 2A @ 5V DC, 1A @ 24V DC.
- If another bank of I/O is required due to module requirements or I/O loading, you can use a cable to link them together. You can have a maximum of three banks of I/O connected with up to two communication cables.
- Each module type has its own distance rating (the number of modules from the power supply). Each module must be within this rating for its type.
- The adapter has a distance rating of five, therefore the adapter must be within five modules of the power supply.

Example Configurations

The following illustrations show examples of two valid system setups.



42131

TIP I/O modules are not required between either the adapter and an end cap or between the power supply and an end cap.

Installation Summary

Complete these steps to install an adapter in a 1769 CompactLogix system.

1. [Set the Network IP Address.](#)
2. [Install the Adapter in a 1769 System.](#)
3. [Wire the Adapter.](#)
4. [Remove or Replace the Adapter.](#) - Optional

If needed, see [Download the Add-on Profiles and Firmware on page 7.](#)

Grounding Considerations



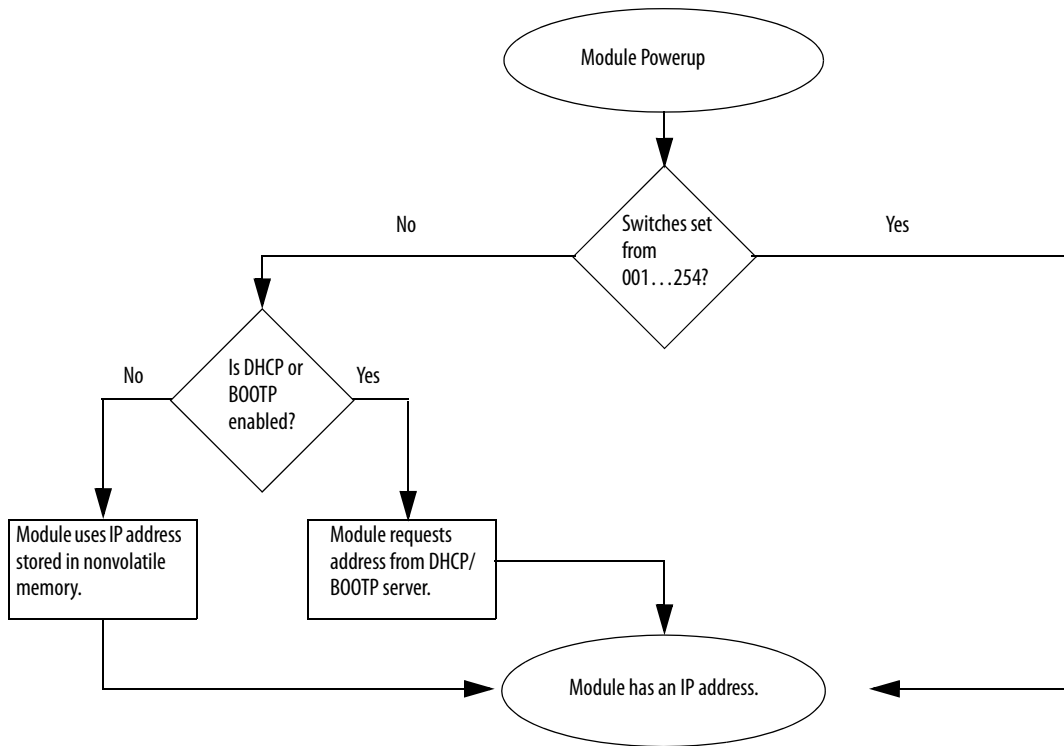
ATTENTION: This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the adapter's mounting tabs or DIN rail (if used) are not required unless you cannot ground the mounting surface. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional information.

Set the Network IP Address

To operate an EtherNet/IP adapter on an EtherNet/IP network, you must set a network IP address. The 1769 EtherNet/IP adapters are shipped with BOOTP/DHCP enabled.

The IP address uniquely identifies the module. The IP address is in the form xxx.xxx.xxx.xxx where each xxx is a number from 000...254.

Figure 4 - How Your Module's IP Address is Set

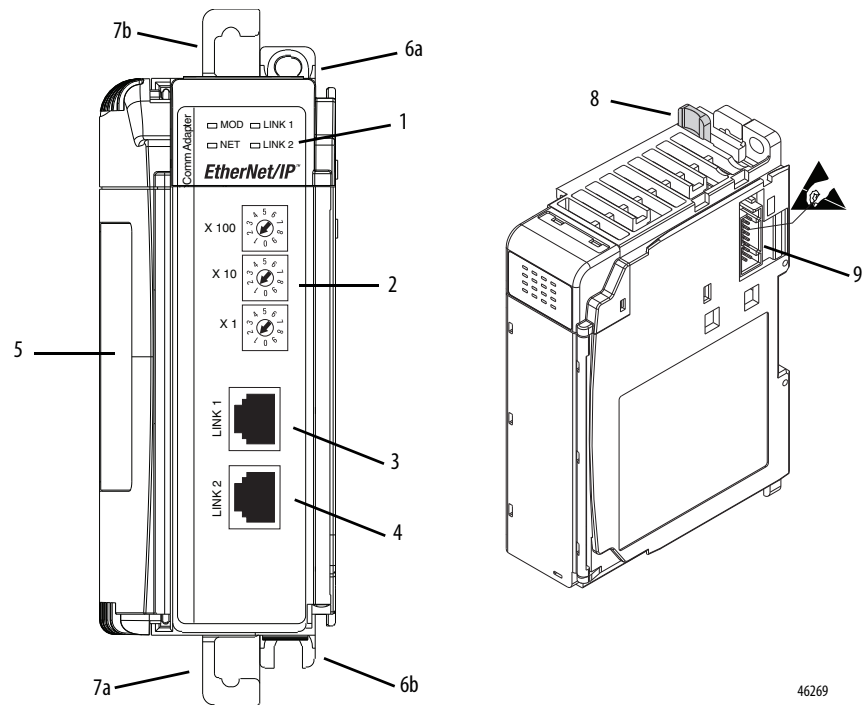


Refer to [Set the Network IP Address on page 47](#) to view all steps for setting the IP address.

Install the Adapter in a 1769 System

Use the following information to install the adapter with the 1769 system.

Adapter Description



46269

Item	Description
1	Status indicators
2	IP address rotary switches
3	Ethernet port
4	Ethernet port for use in a device-level ring network
5	Nameplate label
6	Upper panel mounting tab
	Lower panel mounting tab
7	Upper DIN-rail latch
	Lower DIN-rail latch
8	Bus lever
9	Stationary bus connector with male pins

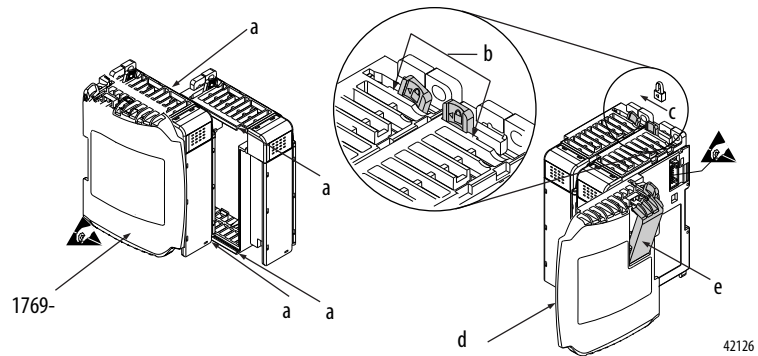
System Assembly

The adapter can be attached to adjacent 1769 modules **before** or **after** mounting.

IMPORTANT The 1769-AENTR adapter must be used with one of the following Rockwell Automation power supply models: 1769-PA2, 1769-PB2, 1769-PA4, or 1769-PB4.

For mounting instructions, see [Mount the Adapter with Screws on page 43](#), or [Mount on a DIN Rail on page 44](#).

Follow these steps to assemble the Compact I/O system.



1. Disconnect power.



WARNING: If you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed before proceeding.

2. Check that the bus lever of the module to the right of the adapter is in the unlocked (fully right) position.
3. Use the upper and lower tongue-and-groove slots (a) to secure the modules together.
4. Move the module back along the tongue-and-groove slots until the bus connectors line up with each other.
5. Use your fingers or a small screwdriver to push the bus lever of the module to the right of the adapter back slightly to clear the positioning tab (b).
6. To allow communication between the adapter and I/O modules, move the bus lever of the module to the right of the adapter fully to the left (c) until it clicks. Make sure it is locked firmly into place.



ATTENTION: When you attach the adapter, it is very important that the bus connectors are securely locked together to create a proper electrical connection.

7. Attach an end cap terminator (**d**) to the last I/O module in the system by using the tongue-and-groove slots as before.
8. Lock the end-cap bus terminator (**e**).

IMPORTANT A 1769-ECR or 1769-ECL right or left end cap must be used to terminate the end of the serial communication bus.

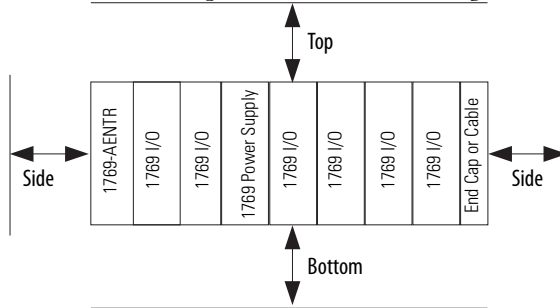
Mount the Adapter and I/O Modules



ATTENTION: During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands) is kept from falling into the adapter or modules. Debris that falls into the adapter or modules could cause damage on power up.

Minimum Spacing

Maintain spacing from enclosure walls, wireways, and adjacent equipment. Allow 50 mm (2 in.) of space on all sides for adequate ventilation, as shown.

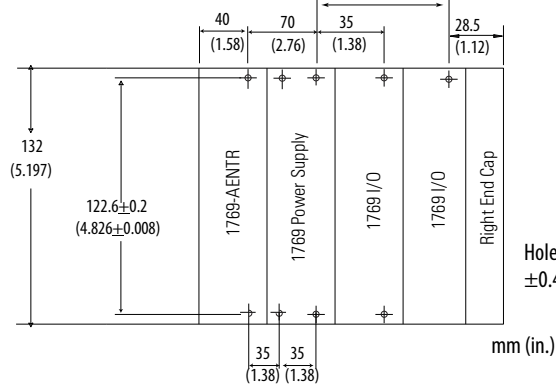


42124

Mount the Adapter with Screws

Mount the adapter or module to a panel by using two screws per adapter or module. Use M4 or #8 panhead screws. Mounting screws are required on every module. This figure illustrates panel mounting using the dimensional template.

For more than 1 module: Number of modules x 35 mm (1.38 in.)



Hole spacing tolerance:
±0.4 mm (0.016 in.)

42121

Mount to Module with Screws by Using the Modules as a Template

The following procedure lets you use the assembled adapter and modules as a template for drilling holes in the panel. If you have sophisticated panel mounting equipment, you can use the dimensional template provided on page [43](#).

Due to the module-mounting hole tolerance, it is important to follow this procedures.

1. On a clean work surface, assemble no more than three modules.
2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.
3. Return the assembled modules to the clean work surface, including all previously mounted modules.
4. Drill and tap the mounting holes for the recommended M4 or #8 screw.
5. Place the modules back on the panel and check for proper hole alignment.
6. Attach the modules to the panel with the mounting screws.

TIP If mounting more modules, mount only the last one of this group and put the others aside. This reduces remounting time during drilling and tapping of the next group.

7. Repeat steps 1 through 6 for any remaining modules.

Mount on a DIN Rail

The adapter can be mounted using the following DIN rails:

- 35 x 7.5mm (EN50022 - 35 x 7.5)
- 35 x 15mm (EN 50022 - 35 x 15)

Follow these steps to mount the module.

1. Verify that the DIN rail latches are closed.
2. Press the DIN rail mounting area of the module against the DIN rail.

The latches momentarily open, then lock into place.



ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials, for example, aluminum and plastic, that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

Wire the Adapter

Use the following information to wire the adapter.

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the adapter's mounting tabs or DIN rail (if used) are not required unless you cannot ground the mounting surface. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional information.

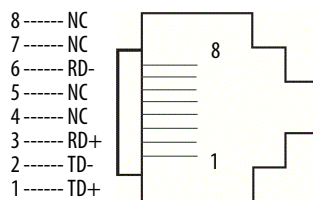
Connect the module to an EtherNet/IP network via an RJ45 cable.



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

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

Wire the RJ45 connector as shown.



Remove or Replace the Adapter

The adapter can be replaced while the system is mounted to a panel or DIN rail.

1. Remove power.



ATTENTION: Do not remove or replace an adapter while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

2. Remove the EtherNet/IP cable from the module.
3. Remove the upper and lower mounting screws from the adapter or open the DIN latches with a flat-blade or Phillips-style screwdriver.
4. On the right-side adjacent module, move its bus lever to the right (unlock) to disconnect it from the adapter being removed.
5. Gently slide the disconnected adapter forward.

If you feel excessive resistance, make sure that you disconnected the adapter from the bus and that you removed both mounting screws or opened the DIN latches.

TIP Rock the module slightly from front to back, if necessary, to remove it, or, in a panel-mounted system, to loosen the screws of adjacent modules.

6. Before installing the replacement adapter, be sure that the bus lever on the right-side adjacent module is in the unlocked (fully right) position.

7. Slide the replacement adapter into the open slot.
8. Connect the adapter and modules together by locking (fully left) the bus levers on the right-side adjacent module.
9. Replace the mounting screws or snap the adapter onto the DIN rail.
10. Insert the Ethernet cable into the module.
11. Set the network address switches to the same value as the removed adapter.

Set the Network IP Address

Topic	Page
Set the Network IP Address with the BOOTP/DHCP Server	49
Set the Network IP Address with RSLinx Software or the Studio 5000 Environment	52

The IP address uniquely identifies the module. The IP address is in the form *xxx.xxx.xxx.xxx* where each *xxx* is a number from 000...254.

There are some reserved values that you cannot use as the first octet in the address. These numbers are **examples** of values you cannot use:

- 001.*xxx.xxx.xxx*
- 127.*xxx.xxx.xxx*
- 223 to 255.*xxx.xxx.xxx*

The specific reserved values that cannot be used vary by application.

For more information about configuring an EtherNet/IP network, see EtherNet/IP Network Configuration User Manual, publication [ENET-UM001](#).

Depending on the 1756 EtherNet/IP communication module, you can use some or all of these tools to set the network Internet Protocol (IP) address:

- Rotary switches - The 1756-ENBT and 1756-EWEB modules do not offer rotary switches. If you are using either of these modules, skip Set the Network IP Address with the Rotary Switches on [page 48](#) and go to Set the Network IP Address with the BOOTP/DHCP Server on [page 49](#).
- Bootstrap Protocol (BOOTP)/Dynamic Host Configuration Protocol (DHCP) server
- RSLinx Classic software
- Studio 5000 environment

The module uses these tools sequentially to set the IP address.

The 1756 EtherNet/IP communication modules are shipped with this configuration:

- BOOTP/DHCP enabled
- Rotary switches set to 999 - when applicable

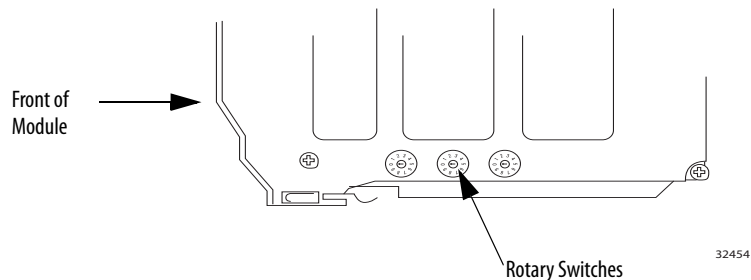
If you need to reset your module's settings to its factory default settings during normal module operation, see [Reset the Module IP Address to a Factory Default Value on page 56](#).

These tools are used in this sequence to set the network IP address.

1. [Set the Network IP Address with the Rotary Switches](#)
2. [Set the Network IP Address with the BOOTP/DHCP Server](#)
3. [Set the Network IP Address with RSLinx Software or the Studio 5000 Environment](#)

Set the Network IP Address with the Rotary Switches

This graphic shows the rotary switches on a 1756 EtherNet/IP communication module. Depending on the module, the switches are on the top or the side of the module.



At powerup, the module reads the rotary switches to determine if they are set to a valid number for the last portion of the IP address, that is, if the numbers are in the range from 001...254.

If the settings are a valid number, these conditions result:

- IP address = 192.168.1.xxx (where xxx represents the switch settings)
- Subnet mask = 255.255.255.0
- Gateway address
 - = 192.168.1.1 for firmware revision 5.008 or later
 - = 0.0.0.0 for firmware revision 5.007 or earlier

IMPORTANT The gateway address of 192.168.1.1 applies only to the 1756-EN2T, 1756-EN2TR, 1756-EN2TRXT, 1756-EN2F, 1756-EN2TSC, and 1756-EN3TR modules with firmware revision 5.008 or later. Other modules use the gateway address of 0.0.0.0 with firmware revision 5.007 or earlier.

For more information, see the Ethernet Design Considerations Reference Manual, publication [ENET-RM002](#).

- The module does not have a host name assigned and does not use any Domain Name System

We recommend that you set the rotary switches to a valid number before installing the module.

If either of these conditions exist, the module attempts to use the BOOTP/DHCP server to set the IP address:

- Rotary switches are not set to a valid number.
- Module does not have rotary switches.

Set the Network IP Address with the BOOTP/DHCP Server

The BOOTP/DHCP server is a standalone server you can use to set an IP address. When used, the BOOTP/DHCP server sets an IP address and other Transport Control Protocol (TCP) parameters.

You can use the BOOTP/DHCP server to set the module's IP address if one of these conditions exists at powerup:

- The module's rotary switches are not set to a valid number and the module is BOOTP/DHCP enabled.
- The module does not have rotary switches and the module is BOOTP/DHCP enabled.

Access the BOOTP/DHCP server from one of these locations:

- Programs > Rockwell Software > BOOTP-DHCP Server

If you have not installed the server, you can download and install it from <http://www.ab.com/networks/ethernet/bootp.html>.

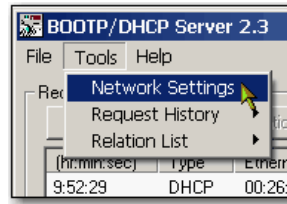
- Tools directory on the Studio 5000 environment installation CD

IMPORTANT Before you start the BOOTP/DHCP server, make sure you have the module's hardware (MAC) address. The hardware address is on a sticker on the side of the communication module and uses an address in a format similar to the following:

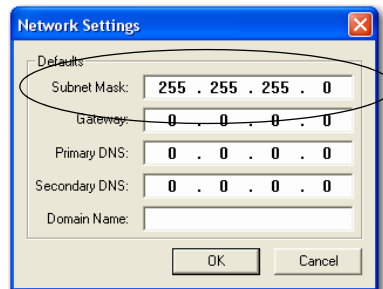
00-00-BC-14-55-35

Follow these steps to set the module's IP address with a BOOTP/DHCP server.

1. Start the BOOTP/DHCP software.
2. From the Tools menu, choose Network Settings.



3. Type the Subnet Mask of the network.

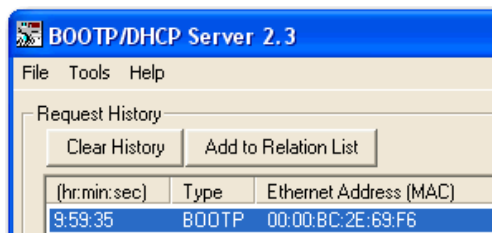


The Gateway address, Primary and/or Secondary DNS address, and Domain Name fields are optional.

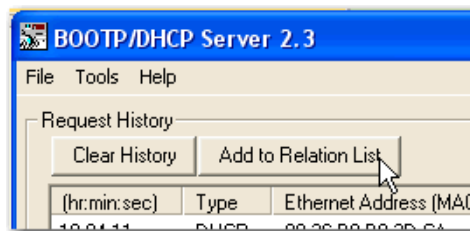
4. Click OK.

The Request History panel appears with the hardware addresses of all modules issuing BOOTP requests.

5. Select the appropriate module.



6. Click Add to Relation List.



The New Entry dialog box appears.

7. Type an IP Address, Hostname, and Description for the module.

8. Click OK.
9. To permanently assign this configuration to the module, wait for the module to appear in the Relation List panel and select it.
10. Click Disable BOOTP/DHCP.

When power is recycled, the module uses the assigned configuration and does not issue a BOOTP request.

IMPORTANT If you do not click Disable BOOTP/DHCP, on a power cycle, the host controller clears the current IP configuration and begins sending BOOTP requests again.

Use DHCP Software

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

Be cautious when using DHCP software to configure a module. A BOOTP client, such as the EtherNet/IP communication modules, can start from a DHCP server only if the DHCP server is specifically written to also handle BOOTP queries. This is specific to the DHCP software package used. Consult your system administrator to see if a DHCP package supports BOOTP commands and manual IP allocation.



ATTENTION: The EtherNet/IP communication module must be assigned a fixed network address. The IP address of this module must not be dynamically provided.

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

Set the Network IP Address with RSLinx Software or the Studio 5000 Environment

This table describes when to set the network IP address with RSLinx software or the Studio 5000 environment.

Conditions	Software to Use	Page
<ul style="list-style-type: none"> A BOOTP server is not available. The EtherNet/IP communication module is connected to another NetLinx network. 	RSLinx	53
The Studio 5000 project is online with a controller that communicates to or through the EtherNet/IP communication module.	Studio 5000 environment	55

Consider these factors when you determine how to set the network IP address:

- Network isolation from or integration into the plant/enterprise network
- Network size - For large networks, isolated networks, it might be more convenient and safer to use a BOOTP/DHCP server rather than the Studio 5000 environment or RSLinx software. The BOOTP/DHCP server also limits the possibility of assigning duplicate IP addresses.
- Company policies and procedures dealing with plant-floor network installation and maintenance
- Level of involvement by IT personnel in plant floor network installation and maintenance
- Type of training offered to control engineers and maintenance personnel

If you use the Rockwell Automation BOOTP or DHCP server in an uplinked subnet where an enterprise DHCP server exists, a module may get an address from the enterprise server before the Rockwell Automation utility even sees the module. You might have to disconnect from the uplink to set the address and configure the module to retain its static address before reconnecting to the uplink. This is not a problem if you have node names configured in the module and leave DHCP enabled.

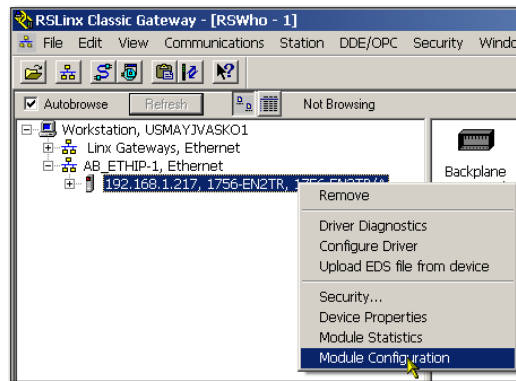
Set the Network IP Address with RSLinx Software

Follow these steps to use RSLinx software to set the communication module's IP address.

1. From the Communications menu, choose RSWho.

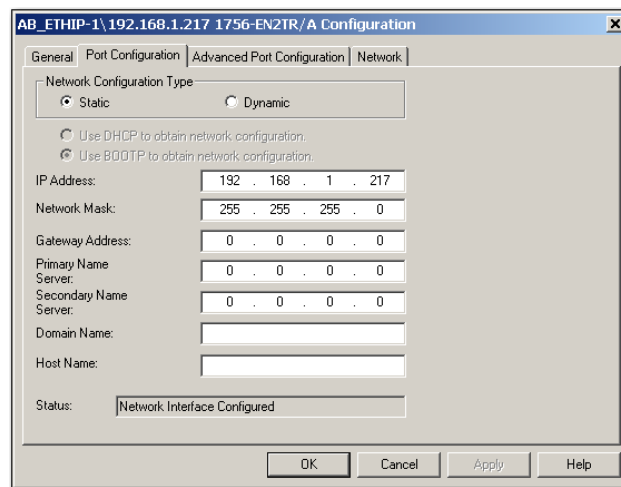
The RSWho dialog box appears.

2. Navigate to the Ethernet network.
3. Right-click the EtherNet/IP module and choose Module Configuration.



The Module Configuration dialog box appears.

4. Click the Port Configuration tab.



5. For Network Configuration Type, click Static to permanently assign this configuration to the port.

IMPORTANT If you select Dynamic, on a power cycle, the controller clears the current IP configuration and resumes sending BOOTP requests.

6. Type this information in the appropriate fields:
 - In the IP Address field, type the IP address.
 - In the Network Mask field, type the network mask address.
 - In the Gateway Address field, type the gateway address.
 - In the Primary Name Server field, type the IP address.
 - In the Secondary Name Server field, type the IP address.
 - In the Domain Name field, type the domain name.
 - In the Host Name field, type the host name.
7. Configure the port settings.

To	Then
Use the default port speed and duplex settings	Leave Auto-negotiate port speed and duplex checked. This setting determines the actual speed and duplex setting.
Manually configure your port's speed and duplex settings	Follow these steps. <ol style="list-style-type: none"> 1. Clear the Auto-negotiate port speed and duplex checkbox. 2. From the Current Port Speed pull-down menu, choose a port speed. 3. From the Current Duplex pull-down menu, choose the appropriate Duplex value, that is, Half Duplex or Full Duplex.

IMPORTANT Consider the following when you configure the module's port settings:

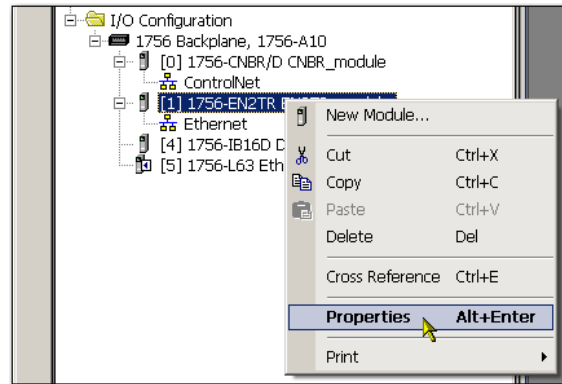
- The speed and duplex settings for the devices on the same Ethernet network must be the same to avoid transmission errors.
- Fixed speed and full duplex settings are more reliable than autonegotiate settings and are recommended for some applications.
- If the module is connected to an unmanaged switch, leave Autonegotiate port speed and duplex checked or communication can be impaired.
- If you force the port speed and duplex with a managed switch, the corresponding port of the managed switch must be forced to the same settings or the module fails.
- If you connect a manually-configured device to an autonegotiate device (duplex mismatch), a high rate of transmission errors can occur.

8. Click OK.

Set the Network IP Address with the Studio 5000 Environment

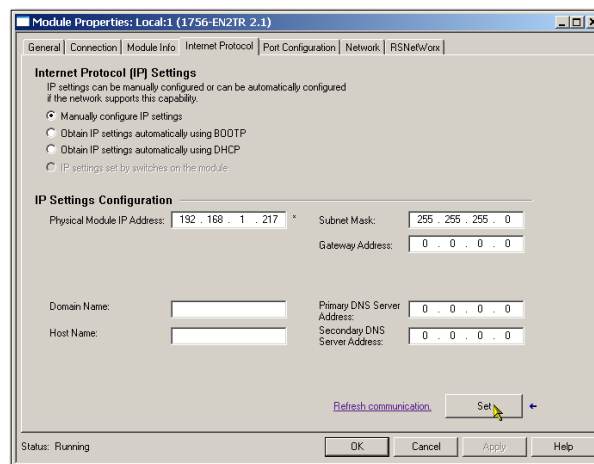
Follow these steps to use the Studio 5000 environment to set the communication module's IP address.

1. In the Controller Organizer, right-click the EtherNet/IP module and choose Properties.



The Module Properties dialog box appears.

2. Click the Port Configuration tab.



3. In the IP Address field, type the IP address.
4. In the other fields, type the other network parameters, if needed.

IMPORTANT The fields that appear vary from one EtherNet/IP module to another.

5. Click Set.
6. Click OK.

Reset the Module IP Address to a Factory Default Value

You can reset the module's IP address to its factory default value with the following methods:

- If the module has rotary switches, set the switches to 888 and cycle power.
- If the module does not have rotary switches, use a MSG instruction to the reset the IP address.

For more information on resetting the network IP address to its default value with a MSG instruction, see Knowledgebase Answer ID 55362, at https://rockwellautomation.custhelp.com/app/answers/detail/a_id/55362 (login required).

Configure a Workstation to Operate on an EtherNet/IP Network

Topic	Page
Select the Driver	57
Configure the Ethernet Communication Driver	58

Before you begin, make sure the workstation is ready to connect to the EtherNet/IP network:

- The Ethernet communication card is already installed in the workstation.
- The IP address and other network parameters are correctly configured for the workstation.
- The workstation is properly connected to the EtherNet/IP network.

Select the Driver

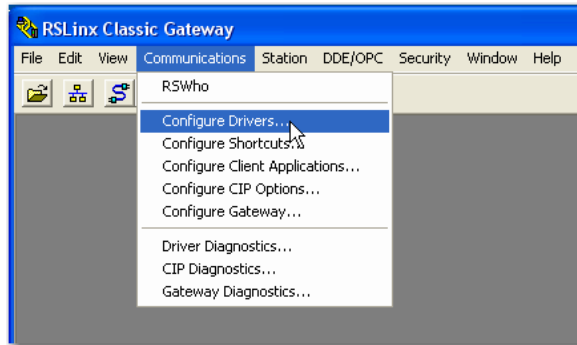
You can choose either of these Ethernet drivers:

- AB_ETHIP
- AB_ETH

Configure the Ethernet Communication Driver

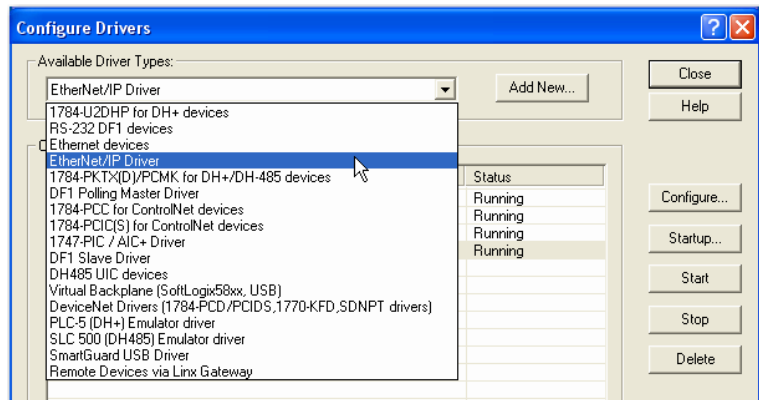
To configure the Ethernet communication driver in RSLinx Classic software, follow these steps.

1. From the Communications pull-down menu, choose Configure Drivers.



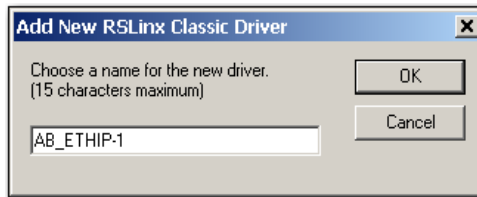
The Configure Drivers dialog box appears.

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



3. Click Add New.

The Add New RSLinx Classic Driver dialog box appears.

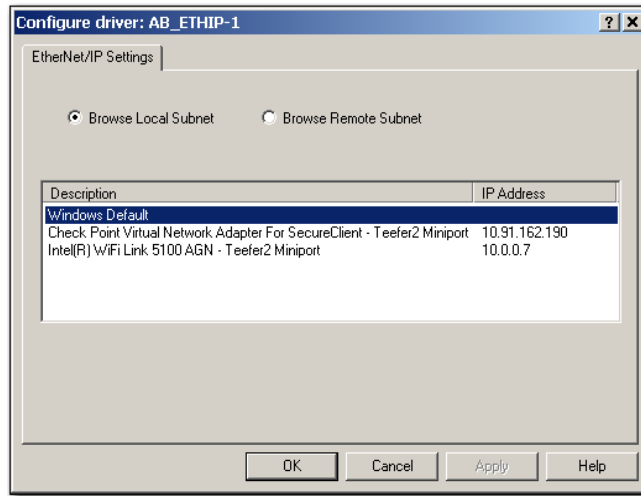


IMPORTANT If you are using a Microsoft Windows 7 VPN client to connect to a secure communication module, such as the 1756-EN2TSC module, we recommend using the RSLinx software Ethernet devices AB_ETH driver for the 1756-EN2TSC module.

If you do not choose this driver, the device is shown in RSLinx software, but you cannot right-click the device listing and request additional information.

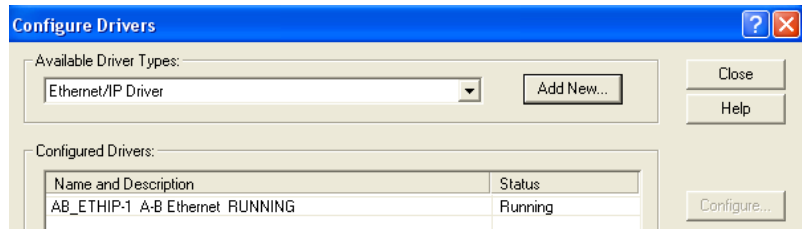
4. Type a name for the new driver and click OK.

The Configure driver dialog box appears.



5. Click Browse Local Subnet.
6. Click Apply.
7. Click OK.

This new driver is now available.



Notes:

USB Communication

Topic	Page
Set Up the Hardware	61
Configure a Module via the USB Port	61
Load Firmware through a USB Port	64

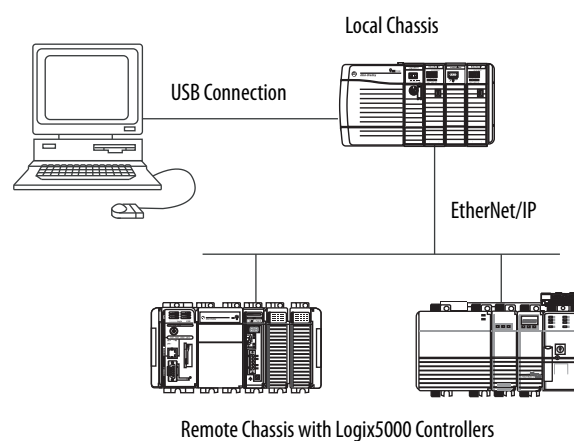
This chapter is intended to show only the steps that differ when using a USB device port. Use this chapter if your module has a USB port.

Set Up the Hardware

Make sure your USB cable is properly connected to the computer and the chassis to facilitate messaging with a remote chassis.

See [Appendix A](#) and [Appendix B](#) to troubleshoot by using status indicators.

Figure 5 - Sharing Data and Transferring Messages



Configure a Module via the USB Port

You can configure some EtherNet/IP communication modules via the USB port.



WARNING: Do not use the USB port in hazardous locations.

To use the USB port, you must have RSLinx Classic software, version 2.51 or later, installed on your computer.

Use a USB cable to connect your computer to the USB port. You can download programs to controllers and configure other devices accessible via the communication module through this connection.



ATTENTION: The USB port is intended for temporary local programming purposes only and is not intended for permanent connection. The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs.

Set Up a USB Driver

To configure RSLinx Classic software to use a USB port, you need to first set up a USB driver. To set up a USB driver, follow these steps.

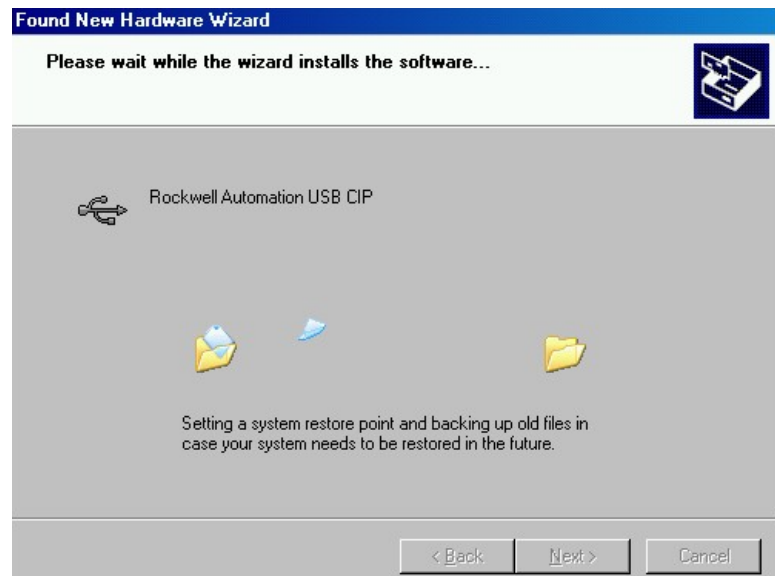
1. With one end installed in the computer, install a USB cable in your communication module's USB port.

The RSLinx Found New Hardware Wizard dialog box appears.



2. Click Install the software automatically (recommended).
3. Click Next.

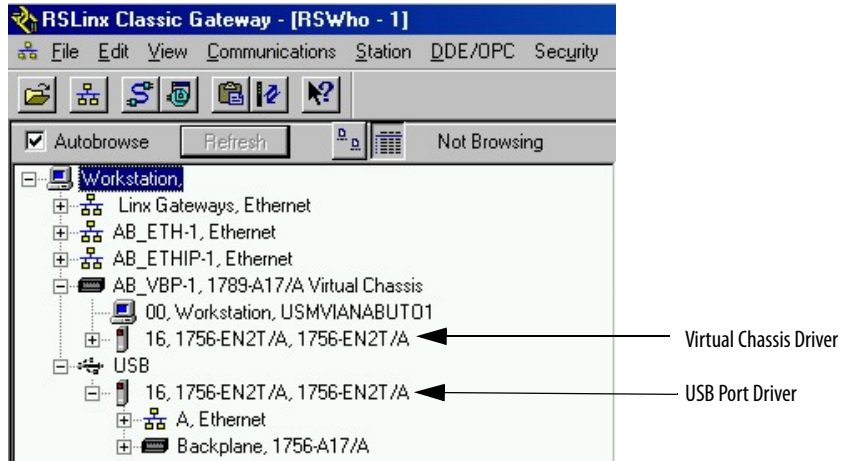
These RSLinx dialog boxes appear consecutively.



4. Click Finish to set up your USB driver.

- In RSLinx Classic software, from the Communications menu, choose RSWho.

The RSLinx Workstation organizer appears.



Your 1756-EN2T module appears under two different drivers, a virtual chassis and the USB port.

Load Firmware through a USB Port

IMPORTANT

Do not simultaneously load firmware for more than one module through a USB port. If you do, one or more of the firmware loads can fail in the middle of the loading process.

1756 EtherNet/IP Status Indicators

This graphic shows the front of the module for these modules (extended-temperature versions not shown).

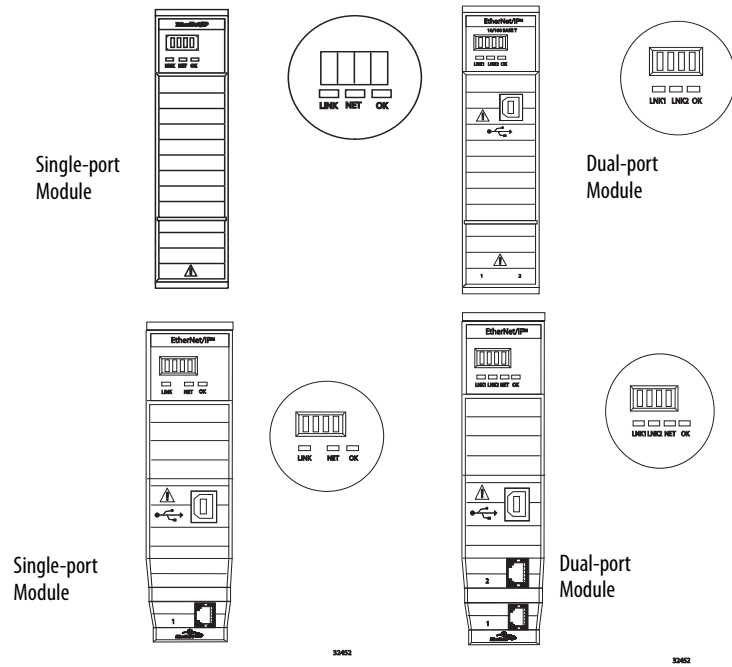


Table 1 - Single-port Module Status Indicators

Status Indicator	Description	Status	State
Module Status Display	Alphanumeric display that scrolls messages. For example, when a module is operating normally, the display scrolls the module's IP address.	N/A	N/A
Link Status (LINK)	Indicates the module's current state with respect to transmitting data on the EtherNet/IP network.	Off	One of these conditions exists: <ul style="list-style-type: none"> The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured. No link exists on the port.
		Flashing green	Activity exists on the port.
		Green	Activity exists on the port.
OK Status (OK)	Indicates the module's current state. For example, this status indicator indicates if the module is executing power-up testing, in the process of a firmware update or operating normally.	Off	The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured.
		Flashing green	The module is not configured. The Module Status display scrolls: BOOTP or DHCP<Mac_address_of_module> For example: BOOTP 00:0b:db:14:55:35 Configure the module.
		Green	The module is operating correctly. The module's IP address scrolls across the Module Status display.
		Flashing red	The module detected a recoverable minor fault. Check the module configuration. If necessary, reconfigure the module.
		Red	The module detected an unrecoverable major fault. Cycle power to the module. If this does not clear the fault, replace the module.
		Network Status (NET)	Indicates if CIP connections are established.
Flashing green	The controller has an IP address and one of these conditions exists: <ul style="list-style-type: none"> The module has not established any CIP connections. If connections are configured for this module, check the connection originator for the connection error code. One or more connections have timed out. For example, an HMI or I/O connection has timed out. Reestablish the connection. 		

Table 1 - Single-port Module Status Indicators

Status Indicator	Description	Status	State
Network Status (NET)	Indicates if CIP connections are established.	Green	The module has established at least 1 CIP connection and is operating properly. The module's IP address scrolls across the Module Status display.
		Red	The module is in conflict mode. It shares an IP address with another device on the network. The module's current IP address scrolls across the Module Status display. The display scrolls: OK <IP_address_of_this_module> Duplicate IP <Mac_address_of_duplicate_node_detected> For example: OK 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4 Change the module's IP address.
		Flashing green/flashing red	The module is performing its power-up testing.

Table 2 - Dual-port Module Status Indicators

Status Indicator	Description	Status	State
Module Status Display	Alphanumeric display that scrolls messages. For example, when a module is operating normally, the display scrolls the module's IP address.	N/A	N/A
OK	Indicates the module's current state. For example, this status indicator indicates if the module is executing power-up testing, in the process of a firmware update or operating normally.	Off	The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured.
		Flashing green	The module is not configured. The Module Status display scrolls: BOOTP or DHCP<Mac_address_of_module> For example: BOOTP 00:0b:db:14:55:35 Configure the module.
		Green	The module is operating correctly. The Module Status display scrolls: OK <IP_address_of_this_module> For example: OK 10.88.60.160
		Flashing red	The module detected a recoverable minor fault. Check the module configuration. If necessary, reconfigure the module.
		Red	The module detected an unrecoverable major fault. Cycle power to the module. If this does not clear the fault, replace the module.
		Both of these conditions exist: <ul style="list-style-type: none"> Status Indicator is Red Module Status Display is scrolling: Image Update Needed 	The module's main firmware image needs to be updated. Follow these steps: <ol style="list-style-type: none"> Update the firmware image. Cycle power to the module. If the status indicators remain the same, that is, red and scrolling Image Update Needed, replace the module.
		Flashing red and green	The module is performing its power-up testing.

Table 2 - Dual-port Module Status Indicators

Status Indicator	Description	Status	State
Network Status (NET)	Indicates if CIP connections are established. IMPORTANT: The new-series 1756-EN2TR and 1756-EN3TR modules have a NET status indicator. The older-series 1756-EN2TR and 1756-EN3TR modules do not have a NET status indicator.	Off	One of these conditions exists: <ul style="list-style-type: none"> The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured. The module is powered but does not have an IP address. Assign an IP address to the module.
		Flashing green	The controller has an IP address and one of these conditions exists: <ul style="list-style-type: none"> The module has not established any CIP connections. If connections are configured for this module, check the connection originator for the connection error code. One or more connections have timed out. For example, an HMI or I/O connection has timed out. Reestablish the connection.
		Green	The module has established at least 1 CIP connection and is operating properly. The module's IP address scrolls across the Module Status display.
		Red	The module is in conflict mode. It shares an IP address with another device on the network. The module's current IP address scrolls across the Module Status display. The display scrolls: OK <IP_address_of_this_module> Duplicate IP <Mac_address_of_duplicate_node_detected> For example: OK 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4 Change the module's IP address.
		Flashing green/ flashing red	The module is performing its power-up testing.
LINK 1 (3) LINK 2 (4)		Off	One of these conditions exists: <ul style="list-style-type: none"> The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured. No link exists on the port. The port is administratively disabled (LNK2). The port is disabled due to rapid ring faults (LNK2).
		Flashing green	Activity exists on the port.
		Green	One of these conditions exists: <ul style="list-style-type: none"> A link exists on the port. The ring network is operating normally on active ring supervisor (LNK2). A ring partial network fault was detected on the active ring supervisor (LNK2).

1768 EtherNet/IP Module Status Indicators

The 1768 EtherNet/IP communication modules support these status indicators. This graphic shows the front of the module for the listed modules.

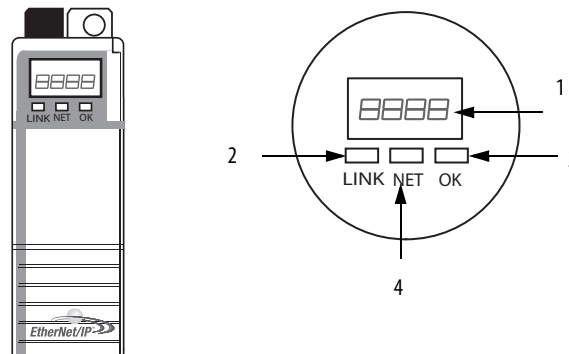


Table 3 - 1768 Module Status Indicators

Number	Status Indicator	Description	Status	State
1	Module Status Display	Alphanumeric display that scrolls messages. For example, when a module is operating normally, the display scrolls the module's IP address.	N/A	N/A
2	Link Status (LINK)	Indicates the module's current state with respect to transmitting data on the EtherNet/IP network.	Off	One of these conditions exists: <ul style="list-style-type: none"> The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured. No link exists on the port.
			Flashing green	Activity exists on the port.
			Green	Activity exists on the port.
3	OK Status (OK)	Indicates the module's current state. For example, this status indicator indicates if the module is executing power-up testing, in the process of a firmware update or operating normally.	Off	The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane.
			Flashing green	The module is not configured. The Module Status display scrolls: BOOTP or DHCP<Mac_address_of_module> For example: BOOTP 00:0b:db:14:55:35 Configure the module.
			Green	The module is operating correctly. The Module Status display scrolls: OK <IP_address_of_this_module> For example: OK 10.88.60.160

Table 3 - 1768 Module Status Indicators

Number	Status Indicator	Description	Status	State
			Flashing red	The module detected a recoverable minor fault. Check the module configuration. If necessary, reconfigure the module.
			Red	The module detected an unrecoverable major fault. Cycle power to the module. If this does not clear the fault, replace the module.
4	Network Status (NET)	Indicates if CIP connections are established. The 1756-EN2TR and 1756-EN3TR modules do not have a NET status indicator.	Off	<p>One of these conditions exists:</p> <ul style="list-style-type: none"> The module is not powered. <ul style="list-style-type: none"> Verify there is chassis power. Verify that the module is completely inserted into the chassis and backplane. Make sure the module has been configured. The module is powered but does not have an IP address. Assign an IP address to the module.
			Flashing green	<p>The controller has an IP address and one of these conditions exists:</p> <ul style="list-style-type: none"> The module has not established any CIP connections. If connections are configured for this module, check the connection originator for a connection error code. One or more connections have timed out. For example, an HMI or I/O connection has timed out. Reestablish the connection.
			Green	The module has established at least 1 CIP connection and is operating properly. The module's IP address scrolls across the Module Status display.
			Red	<p>The module is in conflict mode. It shares an IP address with another device on the network. The module's current IP address scrolls across the Module Status display. The display scrolls: OK <IP_address_of_this_module> Duplicate IP <Mac_address_of_duplicate_node_detected></p> <p>For example: OK 10.88.60.196 Duplicate IP - 00:00:BC:02:34:B4</p> <p>Change the module's IP address.</p>
			Flashing green/ flashing red	The module is performing its power-up testing.

1769 EtherNet/IP Adapter Status Indicators

The 1769 EtherNet/IP supports these status indicators.

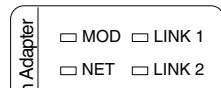


Table 4 - 1769 Module Status Indicators

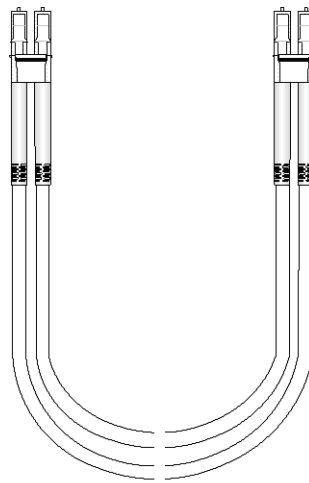
Status Indicator	Description	Status	State
Module (MOD) Status	Indicates the module's current state.	Off	Module does not have 24V/5V DC power.
		Flashing green	Module has not been configured.
		Green	Module has 24V/5V DC power.
		Flashing red	Recoverable fault and/or duplicate IP address has been detected.
		Red	An unrecoverable fault has been detected.
		Flashing red/green	Module is performing power-up self-test.
Network (NET) Status	Indicates the status of the module's IP address and connection status.	Off	Module is not powered, or does not have an IP address.
		Flashing green	The adapter has an IP address, but no CIP connections are established.
		Green	Module has an IP address and at least one established connection.
		Flashing red	One or more of the connections in which the module is the target has timed out.
		Red	A duplicate IP address has been detected.
Link (LNK1/LNK2) Status	Indicates the module's current state with respect to transmitting data on the EtherNet/IP network.	Off	No data is being transmitted.
		Green	Link established at 100 Mbps. Module is ready to communicate.
		Flashing green	Data transmission in progress at 100 Mbps.
		Flashing Yellow	Link activity present on indicated port at 10 Mbps.
		Yellow	Link established on indicated port at 10 Mbps.

Notes:

Fiber Cable and LC Connector

This appendix provides specifications for the fiber cable and LC connector used with the 1756-EN2F EtherNet/IP fiber module or the 1783-ETAP1F and 1783-ETAP2F EtherNet/IP fiber taps.

Figure 6 - Fiber Cable



Specifications

The 1756-EN2F EtherNet/IP fiber module and the 1783-ETAP1F and 1783-ETAP2F EtherNet/IP fiber taps use a fiber cable and LC connector. The fiber cable is typically used in 1 m (3 ft), 2 m, (6 ft), 3 m (9 ft), 5 m (15 ft), and 100 m (300 ft) lengths, but supports lengths up to 2 km (1.24 mi).

IMPORTANT You can special order a fiber cable in any length up to 2 km (1.24 mi) from your fiber cable vendor.

The fiber cable and LC connector supports these specifications.

Table 5 - Fiber Cable and LC Connector Specifications

Attribute	Value
Fiber transceiver type	100Base-FX IEEE802.3u
Optical wavelength	1310 nm no cap
Transmitter launch power at beginning of life (BOL), min Allow -1 dB at end of life (EOL)	-19 dBm into 62.5/125 μ m fiber, N/A = 0.275 -22.5 dBm into 50/125 μ m fiber, N/A = 0.20
Receiver sensitivity, min	-31.8 dBm
Receiver sensitivity, max	-14 dBm

Table 5 - Fiber Cable and LC Connector Specifications

Attribute	Value
Fiber channel power budget at rated BER (Two connected modules or taps, either the 1756-EN2F EtherNet/IP fiber module, or 1783-ETAP1F or 1783-ETAP2F EtherNet/IP fiber taps)	12.8 dB for 62.5/125 μm multimode fiber 9.3 dB for 50/125 μm multimode fiber
Fiber type	Glass 62.5/125 μm and 50/125 μm multimode fiber Simplex or duplex Jacket type and jacket diameter is dependent on connector selection Graded Index (GI) fiber Per IEC 60794-1-1, IEC 60793-2-10 category A1 fibers
Connector type	IEC 61754-20 LC connector, max. insertion loss 0.75 dB per connection
Channel length, max	2 km (1.24 mi) ⁽¹⁾

(1) The channel, that is, connectors and cable, must not exceed the allowable power budget.

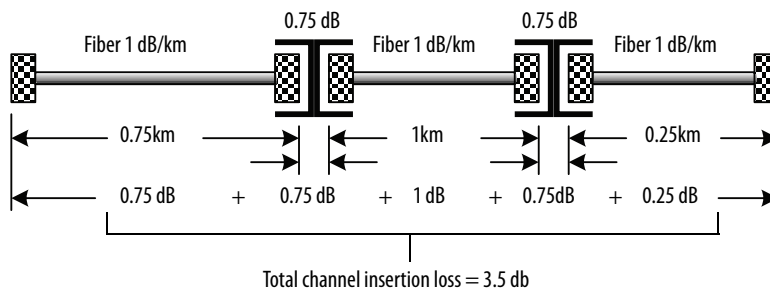
IMPORTANT

Allow at least 5.08 cm (2 in.) for the fiber cable bend radius. Contact the cable manufacturer for more information on the recommended cable bend radius.

EXAMPLE In the example shown here, the channel insertion loss is calculated for an optical channel based on these factors:

- 1 dB/km fiber
- 0.75 dB per adapter

Note that in this example, the end connectors are not factored in the calculations.



ATTENTION: The maximum power budget for this example is 12.8 dB for 62.5/125 μm fiber. Therefore, the channel insertion loss for the example of 3.5 dB is less than the maximum power budget.

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