Installation Instructions

Allen-Bradley

ControlNet Modules

Catalog Numbers 1756-CN2, 1756-CN2R, 1756-CN2RK, 1756-CN2RXT, 1756-CNB, 1756-CNBR, 1768-CNB, 1768-CNBR

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).

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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 to this revision.

Topic	Page
Updated artwork to illustrate module redesign	Throughout document
Updated EDS file and firmware download procedures	Chapters 1, 2, and 3
Updated 1756 status indicators	Appendix A

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This manual describes how to install and start up ControlNet modules with Logix5000 ™ controllers.

You should use this manual if you program applications that use the ControlNet 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 Automation 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 Studio 5000 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.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlNet Network Configuration User Manual, publication CNET-UM001	Provides details about how to use ControlNet communication modules with Logix5000 controllers and communicate with other devices on the ControlNet network.
ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002	Describes the required components of a ControlNet coax media system.
ControlNet Standard and High-flex Coax Cable Installation Instructions, publication 1786-IN009	Provides application information you need to consider when you install standard RG-6 (catalog number 1786-RG6/A) and high-flex RG-6 (catalog number 1786-RG6F/A) coax cable in your ControlNet network.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

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.

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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 Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations.	**Informations sur l'utilisation de cet équipement en environnements dangereux.**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

WARNING: EXPLOSION HAZARD

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must only be changed in an area known to be nonhazardous.

WARNING: RISQUE D'EXPLOSION

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

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:

- This equipment must be installed in an enclosure providing at least IP54 protection when applied in Zone 2 environments.
- 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 40% when applied in Zone 2 environments.
- This equipment must be used only with ATEX certified Rockwell Automation backplanes.
- 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: This equipment is not resistant to sunlight or other sources of UV radiation.

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: Personnel responsible for the application of safety-related programmable electronic systems (PES) shall be aware of the safety requirements in the application of the system and shall be trained in using the system.

ControlLogix-XT Systems

The ControlLogix-XT™ products include control and communication system components that, when used with FLEX I/O-XT™ products, provide a complete control system solution that can be used in environments where temperatures range from -20...70 °C (-4...158 °F).

When used independently, the ControlLogix-XT system can withstand environments where the temperature ranges from -25...70 °C (-13...158 °F).

ControlLogix-XT with Traditional ControlLogix Components

IMPORTANT **ControlLogix-XT system components are rated for extreme environmental conditions only when used properly with other Logix-XT system components.** The use of ControlLogix-XT components with traditional ControlLogix system components nullifies extreme-environment ratings.

If a ControlLogix-XT module is used with traditional ControlLogix products that are not designed for extreme environments, the ControlLogix-XT module can withstand only the environments specified for the traditional ControlLogix version of the module. For example, if a 1756-CN2RXT module is used in a traditional 1756-A10 chassis, the 1756-CN2RXT module can withstand only the environment specified for the traditional 1756-CN2R module.

The ControlLogix-XT system components are designed to meet the same and greater operational and environmental requirements as traditional ControlLogix products.

When a ControlLogix-XT component is used as a replacement for a traditional ControlLogix component, the functional and environmental requirements of the traditional ControlLogix component apply.

Redundant Media

These 1756 ControlNet bridge modules have two ControlNet ports to support redundant media:

- 1756-CN2R
- 1756-CNBR
- 1756-CN2R
- 1756-CN2RXT
- 1756-CN2RK

For information about using these modules with redundant media, see Redundant Media on page 33.

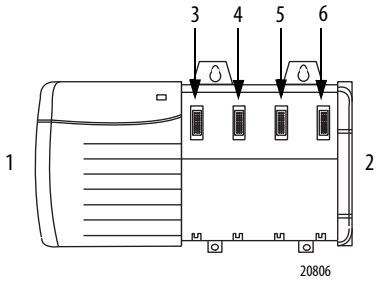
Installation Summary

To install a communication module in a 1756 ControlLogix chassis, complete these steps.

1. Determine Module Slot Location.
2. Set the Node Address.
3. Install the Module.
4. Connect the Module to a ControlNet Network.
5. Remove the Module.
6. Install the EDS File and Get Firmware Updates.
7. Connect a Programming Terminal to the Network with a 1786-CP Cable.
8. Connect to the Module via the USB Port.

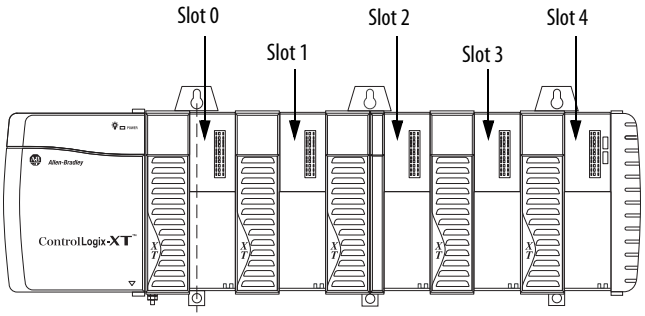
Determine Module Slot Location

Install the communication module in any slot in the ControlLogix chassis. You can install multiple communication modules in the same chassis. This example shows chassis slot numbering in a 4-slot chassis. Slot 0 is the first slot and is always the leftmost slot in the rack.



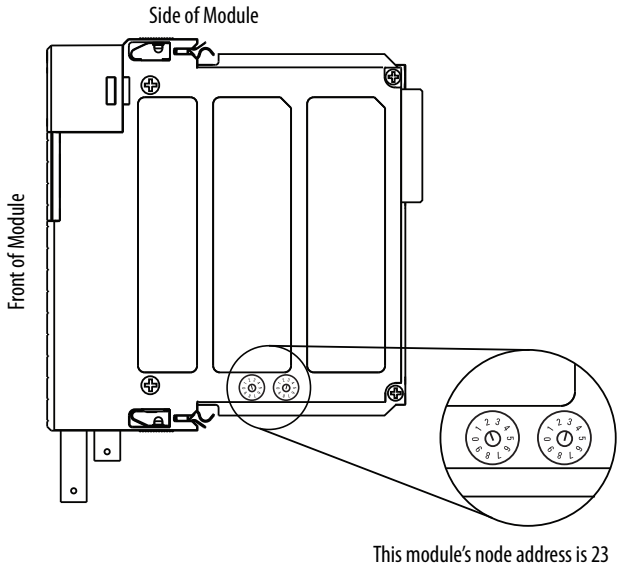
Item	Description
1	Power supply
2	Chassis
3	Slot 0
4	Slot 1
5	Slot 2
6	Slot 3

This example shows chassis slot numbering in a ControlLogix-XT chassis.



Set the Node Address

Use a small screwdriver to set the module's node address switches. You must specify a unique ControlNet node address. You can select an address of 01...99. Address 00 is an invalid ControlNet node address.



Install the Module

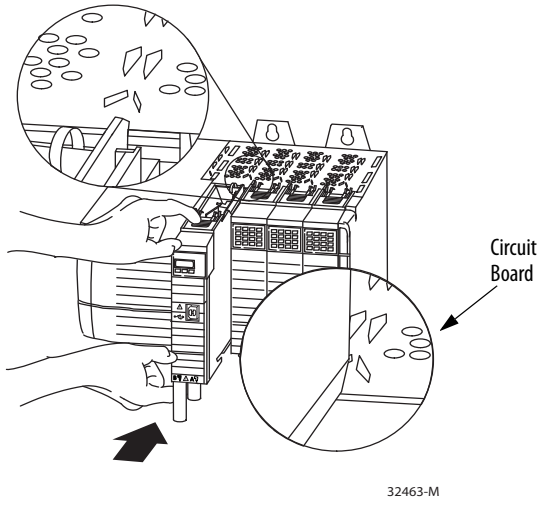
WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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 may create electrical resistance that can affect module operation.

To install the module, follow this procedure.

1. Align the circuit board with the top and bottom guides in the chassis.
2. Slide the module into the chassis making sure the module backplane connector properly connects to the chassis backplane.

   The module is properly installed when it is flush with the power supply or other installed modules.



ATTENTION: Do not force the module into the backplane connector. If you cannot seat the module with firm pressure, check the alignment. Forcing the module into the chassis can damage the backplane connector or the module.

Connect the Module to a ControlNet Network

You can connect the module to the ControlNet network by using a tap, catalog numbers 1786-TPR, 1786-TPS, 1786-TPYR, 1786-TPYS, or 1786-TCT2BD1.

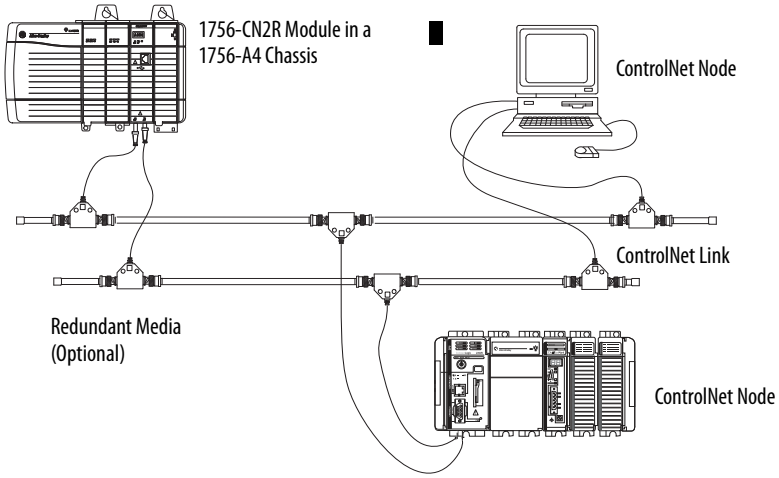
WARNING: If you connect or disconnect the communication cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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

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

ATTENTION: The USB port is intended only for temporary local programming purposes 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.

This example shows a ControlNet network using redundant media.

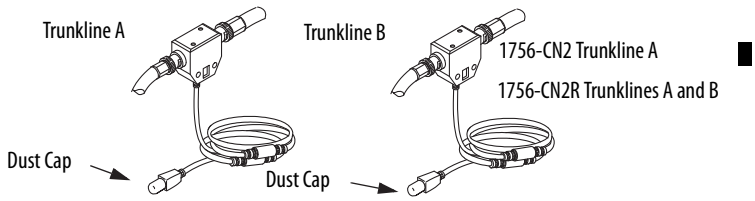


TIP For network connections, we recommend taps with a straight connector (catalog number 1786-TPS or 1786-TPYS) because of the location of the BNC connectors on the bottom of the module.

To connect the module to the network with a tap, perform this procedure.

1. Remove and save the dust caps from the ControlNet taps.

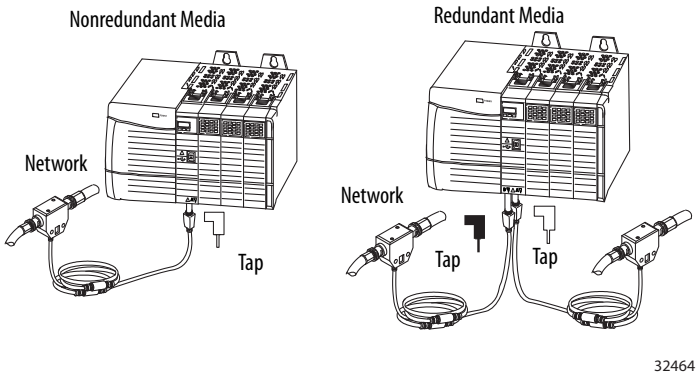
ATTENTION: Do not allow any metal portions of the tap to contact any conductive material. If you disconnect the tap from the module, place the dust cap back on the straight or right-angle connector to prevent the connector from accidentally contacting a metallic grounded surface.



2. Connect the tap's straight or right-angle connector to the module's BNC connector.

If your network supports	Then connect the tap's connector
Nonredundant media (all 1756-CN*x* modules)	From trunkline A to channel A on the module.
Redundant media (1756-CNBR, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK modules)	From trunkline A to channel A on the 1756-CN2R module. From trunkline B to channel B on the 1756-CN2R module.

IMPORTANT To avoid accidentally reversing the tap connections, before making your connection, check the tap drop cable for the label indicating the attached segment. Accidental connection reversals produce incorrect status displays and require troubleshooting.



3. Apply power to the module and check the status indicators to determine whether the power supply and module are operating properly.

   For more information about status indicators, see 1756 ControlNet Status Indicators on page 37.

Remove the Module

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

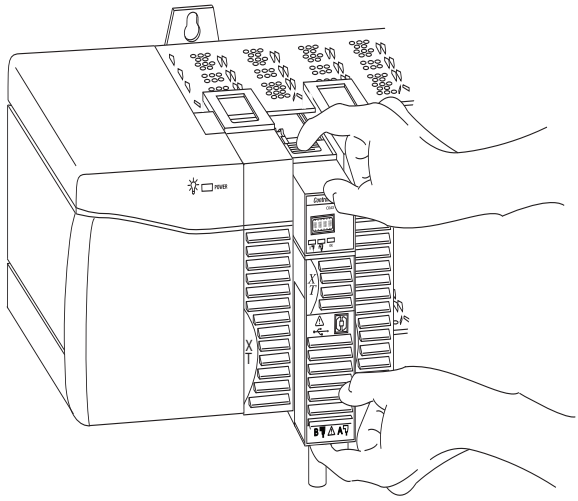
WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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 may create electrical resistance that can affect module operation.

To remove or replace the module, use this procedure.

1. Push on the upper and lower module tabs to disengage them.
2. Slide the module out of chassis.

   The figure shows the removal of a 1756-CN2RXT module.



Reset the Module to the Original Factory Settings

If you are using a 1756-CN2, 1756-CN2R, 1756-CN2RXT or 1756-CN2RK communication module, you can reset the module to its original settings and clear all keeper information.

To reset a module to its factory settings, complete these steps.

1. Remove power from the chassis.

IMPORTANT	Removing power from the chassis before removing the module is only necessary if the module is in a Class I, Division 2 hazardous location.

2. Remove the module from the chassis.
3. Reset the switches to 00.

IMPORTANT	Do not use the 00 switch setting during normal module operation.

4. Replace the module in the chassis.
5. Apply power to the chassis.
6. After the module status display reads 'Reset Complete—Change Switch Settings', remove power from the chassis.
7. Remove the module from the chassis.
8. Set the switches to their final value.
9. Replace the module in the chassis.
10. Apply power to the chassis.

Keeper Configuration—Automatic Keeper Crossload

The 1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK communication modules are keeper capable modules. If a keeper capable module has a valid configuration and has the lowest address among the keeper capable nodes on the network, it becomes the active keeper. The active keeper is the node that distributes network configuration information to other nodes as the network is formed or as nodes are added to the network.

When the module is first removed from the box or is reset to the original factory settings, it will automatically attempt to crossload configuration information from the current active keeper. If an active keeper with a valid network configuration is present on the active network, the configuration crossload will succeed. No user intervention is needed. However, if an active keeper does not exist or does not have a valid network configuration, you must use RSNetWorx for ControlNet software to download the network configuration information.

Install the EDS File and Get Firmware Updates

For the 1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK modules, the EDS file can be uploaded directly from the module. This feature lets you register the EDS file for your module from within RSLinx software.

Use the steps below to register the EDS file from within RSLinx software.

1. Open RSLinx software and browse for the module.

   Before you begin, make sure you have the correct version of RSLinx software.

ControlNet Module	Required Version of RSLinx Software
1756-CN2RXT or 1756-CN2RK	2.55 or later
1756-CN2/C or 1756-CN2R/C	2.55 or later
1756-CN2/B or 1756-CN2R/B	2.51 or later

2. Right-click the module and choose Upload EDS file from device.

   The Upload EDS wizard opens.

3. Complete the EDS wizard to register the EDS file.

Download the Firmware

Complete these steps to download and install the firmware.

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

3. On the Get Downloads tab, click Find Product Downloads.
4. Enter your search criteria and click Go.
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 .

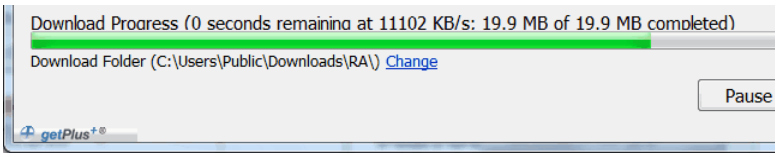
The Available Downloads window opens.

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.

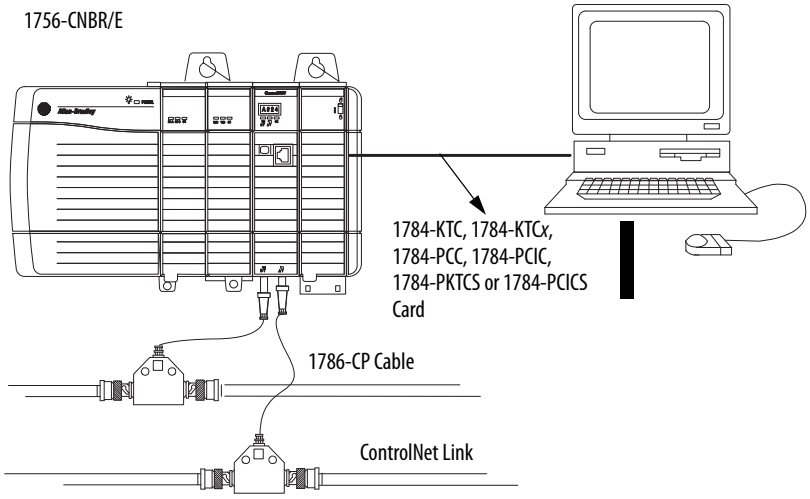


9. When the downloaded is complete, click Close.
10. Locate the downloaded .zip file and extract it to a temporary directory.
11. Use the ControlFlash utility to install the firmware.

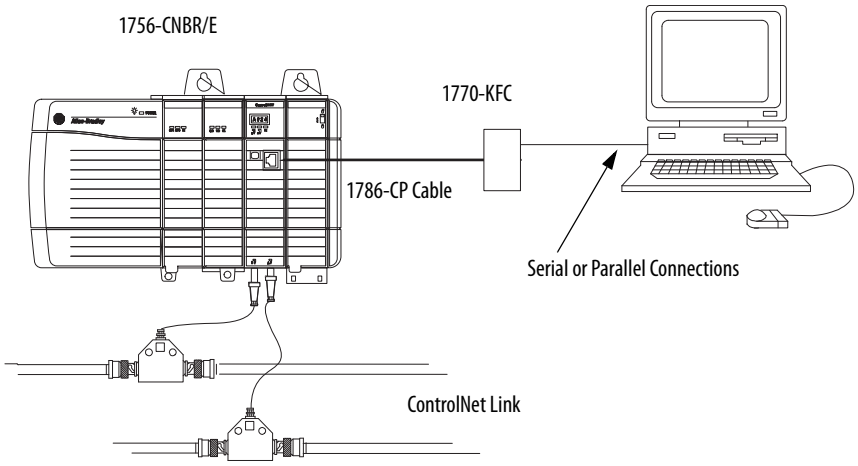
Connect a Programming Terminal to the Network with a 1786-CP Cable

To connect a programming terminal to the network using a 1786-CP cable, you have the following options:

- Use a 1784-KTC, 1784-KTC*x,* 1784-PCC, 1784-PCIC, 1784-PKTCS, or 1784-PCICS communication card and a 1786-CP cable.



- Use a 1770-KFC communication interface, a serial or parallel connection, and a 1786-CP cable.



The 1786-CP cable can be plugged into any ControlNet network product's NAP to provide programming capability on the ControlNet network. A programming terminal connected through this cable is counted as a node and must have a unique network address.

ATTENTION: Use a 1786-CP cable when connecting a programming terminal to the network through an NAP. Using a commercially available RJ-style cable could result in network failure.

WARNING: The NAP is intended only for temporary local programming purposes and is not intended for permanent connection. If you connect or disconnect the NAP cable with power applied to 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.

Connect to the Module via the USB Port

The 1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK communication modules include a USB port. For more information about USB setup and configuration, see USB Communication on page 47.

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

ATTENTION: The USB port is intended only for temporary local programming purposes 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.

The USB port on ControlNet modules uses a Type B receptacle. The port is USB 1.1-compatible and runs at 12 Mbps.

See Table 7 - RSLinx Software Versions on page 47 for more information about using the correct version of RSLinx software.

Use a USB cable to connect your computer to the USB port. The connection lets you download programs to controllers and configure other devices, which are accessible by the module, directly from your computer.

IMPORTANT Do not simultaneously upgrade the firmware for more than one module at a time through a USB port. If you do, one or more of the updates may fail in the middle of the upgrade.

For more information about setting up a USB port, see USB Communication on page 47.

Install a 1768 ControlNet Communication Module

Topic	Page
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Installation Summary	25
Set the Node Address	25
Install the Module	26
Connect the Module to a ControlNet Network	28
Remove the Module	29
Install the EDS File and Get Firmware Updates	31

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 considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbances.

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, V2, V1, V0 (or equivalent) if non-metallic. 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 Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures

North American Hazardous Location Approval

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

Redundant Media

The 1768-CNBR bridge module has two ControlNet ports to support redundant media. For information about using the module with redundant media, see Redundant Media on page 33.

Installation Summary

To install a communication module in a 1768 ControlLogix chassis, complete these steps.

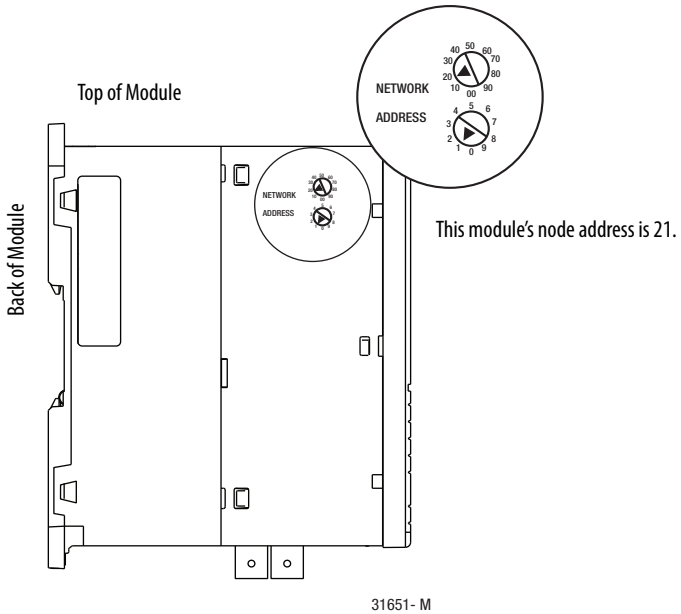
1. Set the Node Address.
2. Install the Module.
3. Connect the Module to a ControlNet Network.

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 Node Address

Use a small screwdriver to set the module's node address switches. You must specify a unique ControlNet node address. You can select an address of 01...99. Address 00 is an invalid ControlNet node address.



Install the Module

To install the module, follow this procedure.

If You Use Screws to Mount the Module

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

The instructions show how to mount the module on DIN rail. If you are using screws instead of DIN rail, make these changes to the instructions.

Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional information.

1. Use the module 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 module to your panel.

   Use 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.

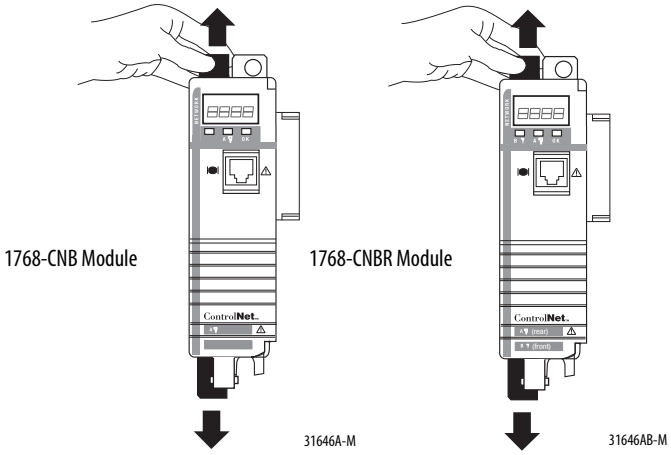
Mount on a DIN Rail

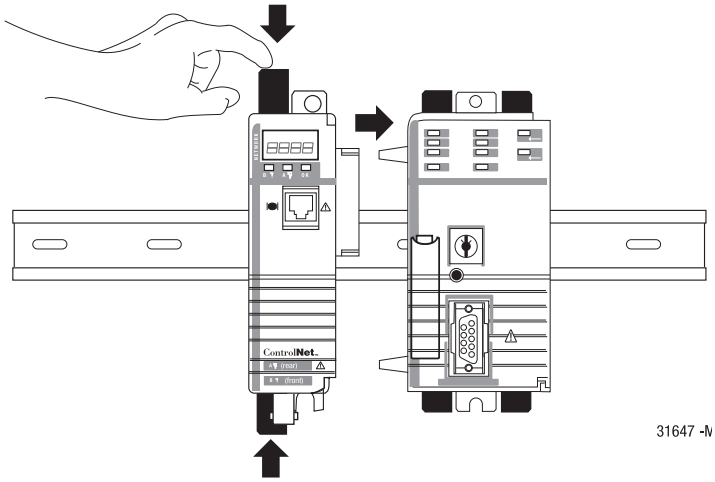
Follow these steps to install the module on a DIN rail.

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 (7.8 in.) and use end-anchors appropriately.

2. Mount the module on the DIN rail, as shown.





Connect the Module to a ControlNet Network

You can connect the module to the ControlNet network by using a tap (catalog number 1786-TPR, 1786-TPS, 1786-TPYR, 1786-TPYS, or 1786-TCT2BD1) or a network access cable (catalog number 1786-CP).

See the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002, for additional information.

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.

ATTENTION: 1768 modules are not designed for removal and insertion under power. Removal or insertion of a 1768 module while power is applied can result in module damage or unintended operation.

The 1768-CNB and 1768-CNBR modules have a network access port (NAP) available.

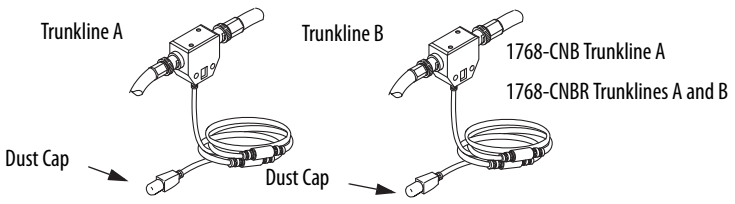
WARNING: The NAP is intended for temporary local programming purposes only and not intended for permanent connection. If you connect or disconnect the NAP cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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

Perform the following steps to connect the module to the network by using a tap.

1. Remove and save the dust caps from the ControlNet network taps.

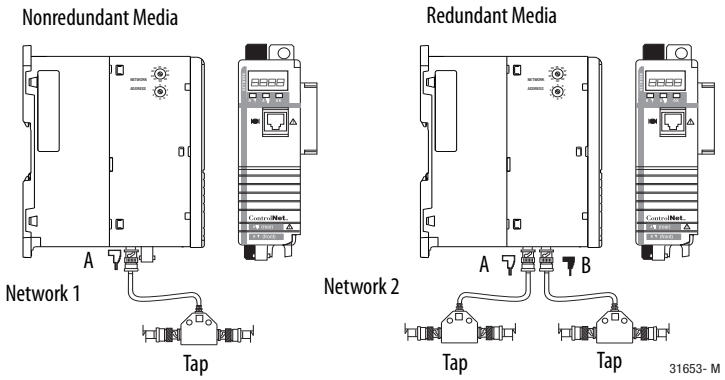
ATTENTION: Do not allow any metal portions of the tap to contact any conductive material. If you disconnect the tap from the module, place the dust cap back on the straight or right-angle connector to prevent the connector from accidentally contacting a metallic grounded surface.



2. Connect the tap's straight or right-angle connector to the module's BNC connector.

If your network supports	Connect the tap's connector
Nonredundant media (1768-CN*x* modules)	From trunkline A to channel A on the module.
Redundant media (1768-CNBR modules)	• From trunkline A to channel A on the 1768-CNBR module. • From trunkline B to channel B on the 1768-CNBR module.

IMPORTANT To avoid accidentally reversing the tap connections on 1768-CNBR installations, before making your connection, check the tap drop cable for the label indicating the attached segment. Accidental connection reversals produce incorrect status displays and require troubleshooting.



3. Apply power to the module and check the status indicators to determine whether the power supply and module are operating properly.

Remove the Module

To remove or slide a module, turn off the power and pull out the DIN rail connectors on the module. After you turn off the power, wait for all of the lights on the power supply and controller to turn off before you disconnect any modules.

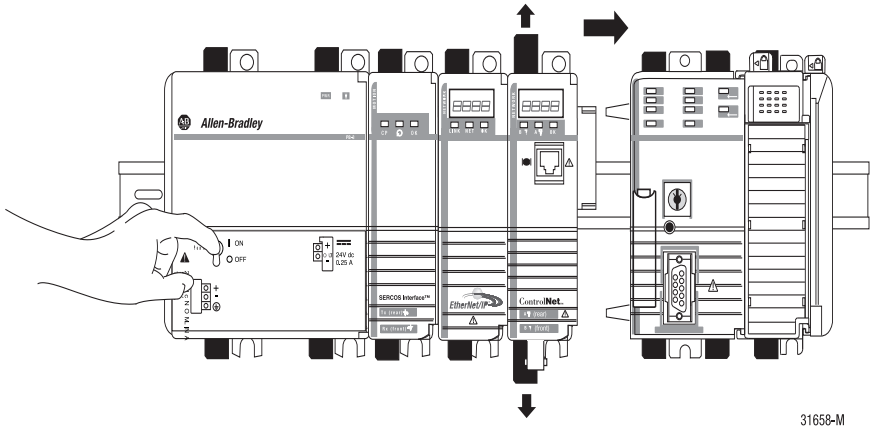
ATTENTION: 1768 modules are not designed for removal and insertion under power. Removal or insertion of a 1768 module while power is applied can result in module damage or unintended operation.

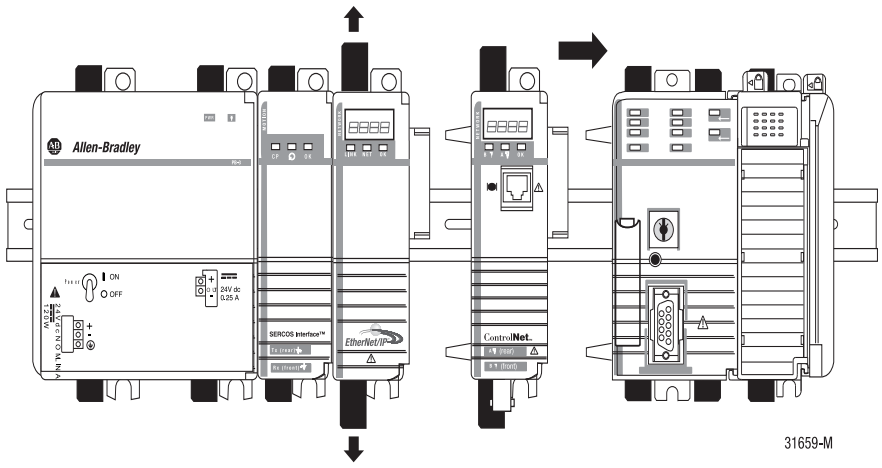
IMPORTANT When you turn the CompactLogix power supply off, make sure you wait for all status indicators on the power supply and controller to turn off before disconnecting any part from the system.

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

- When you turn off the power, the controller writes its project to memory.
- If you don't wait for the lights to turn off, you will lose your project.

Remove a module as shown below.





Install the EDS File and Get Firmware Updates

For the 1768-CNB and 1768-CNBR modules, the EDS file can be uploaded directly from the module. This feature lets you register the EDS file for your module from within RSLinx software.

Use the steps below to register the EDS file from within RSLinx software.

1. Open RSLinx software and browse for the module.
2. Right-click the module and choose Upload EDS file from device.

   The Upload EDS wizard opens.
3. Complete the EDS wizard to register the EDS file.

Download the Firmware

Complete these steps to download and install the firmware.

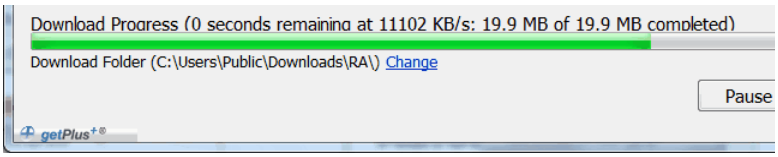
1. Go to the Rockwell Automation Web site at http://www.rockwellautomation.com/.
2. From the Support tab, product Product Compatibility & Download Center.

3. On the Get Downloads tab, click Find Product Downloads.
4. Enter your search criteria and click Go.
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. Use the ControlFlash utility to install the firmware.

Redundant Media

Topic	Page
Use Redundant Media	33

These ControlNet bridge modules support redundant media:

- 1756-CN2R
- 1756-CN2RK
- 1756-CN2RXT
- 1756-CNBR/E
- 1768-CNBR

Use Redundant Media

You can run a second trunk cable between ControlNet nodes for redundant media. With redundant media, nodes send signals on separate trunks. The receiving node compares the quality of the two signals and permits use of the better signal while retaining the other signal on a back-up cable should the primary trunk cable fail.

Trunk cables on a redundant cable link are defined by the segment number and the redundant trunk-cable letter.

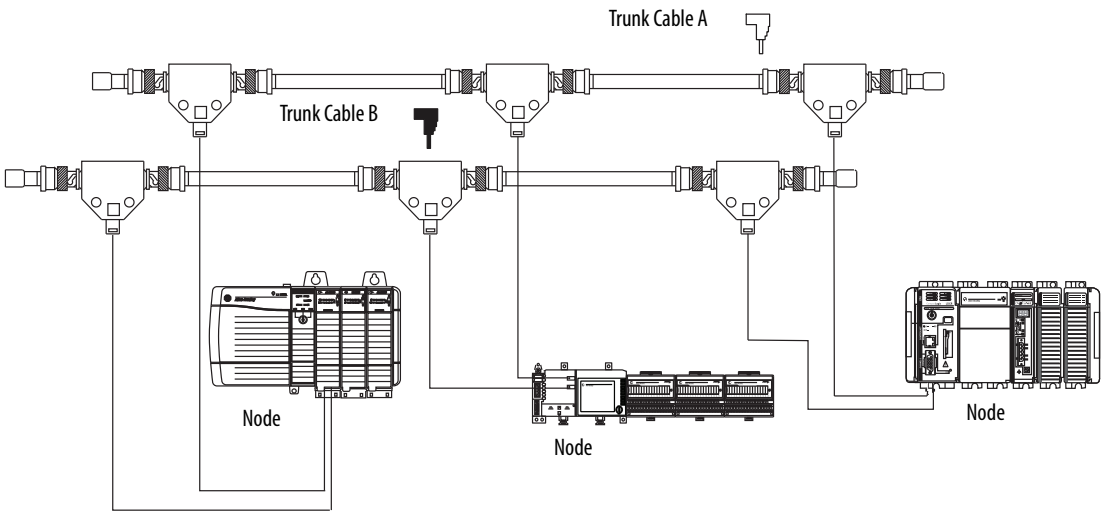
Actual ControlNet products are labeled with these icons:

The shaded icon represents redundant media.

In this example, the redundant trunk cable is trunk cable B.

IMPORTANT ControlNet redundant media can tolerate only one fault. If there is a fault on both channel A and B, network integrity is not guaranteed.

Figure 1 - Redundant Media Example



To use redundant media, all nodes must support redundant media.

Observe these guidelines when planning a redundant media system in a hazardous area:

- Route trunk cables A and B differently to reduce the chance of both cables being damaged simultaneously.
  - Trunk cables A and B may contain different lengths of cable if you are using 1786-RPA/B repeater adapters. However, the difference in length must not exceed 800 m (2640 ft).
  - Trunk cables A and B must have identical configurations. Each segment must contain the same number of taps, nodes, and repeaters. Connect nodes and repeaters in the same relative sequence on both trunk cables.
- Each node on a redundant-cable link must support redundant coax connections and be connected to both trunk cables at all times. Any nodes connected to only one side of a redundant-cable link will result in media errors on the unconnected trunk cable.
- Install the cable system so that the trunk cables at any physical device location can be easily identified and labeled with the appropriate icon or letter. Each redundant ControlNet device is labeled so you can connect it to the corresponding trunk cable.

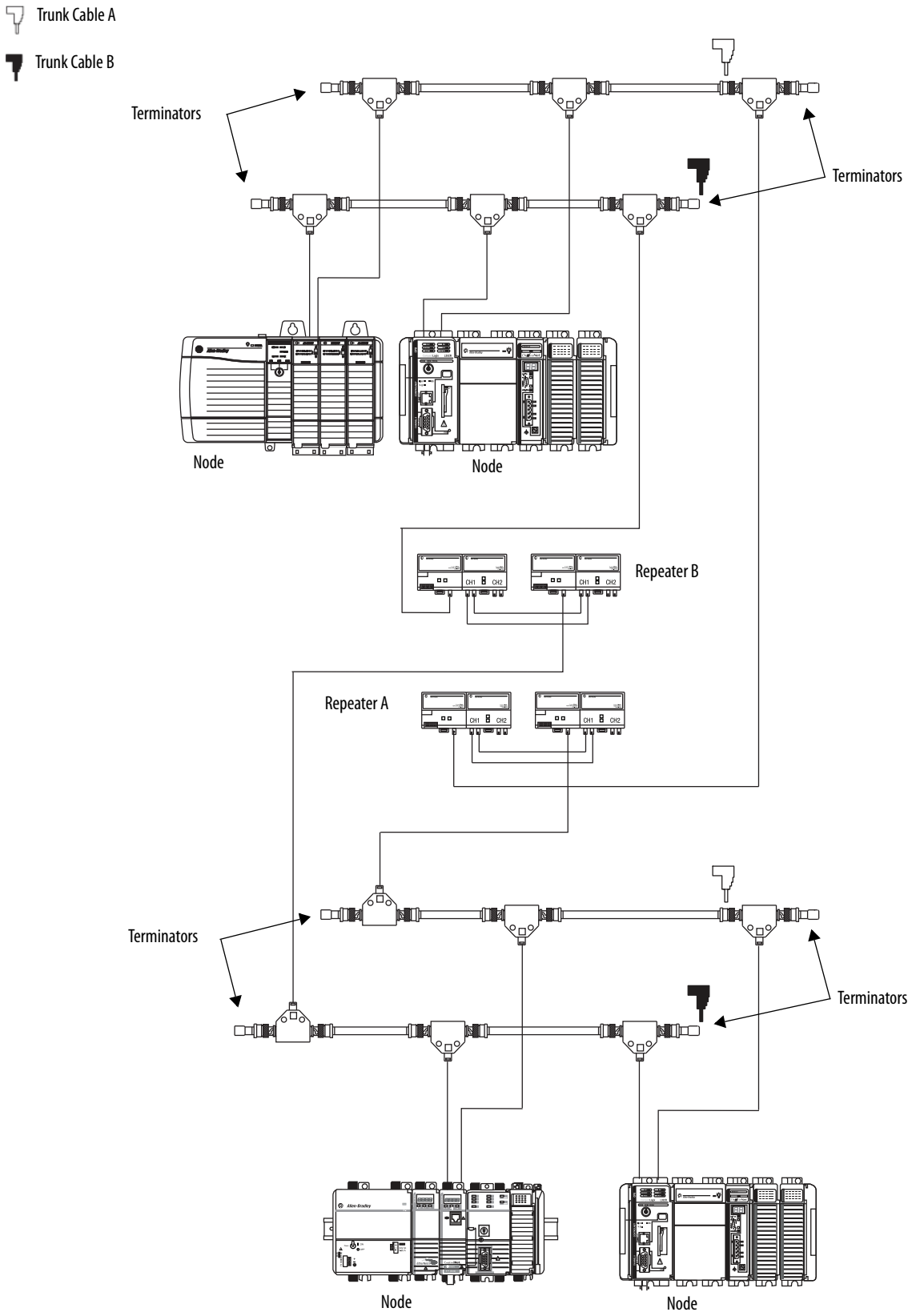
IMPORTANT We recommend that you do not mix cable connections when using redundant cabling, such as connecting trunk cable A to the B connector on the node. Mixing cable connections makes it difficult to interpret cable fault indications and locate a bad cable segment.

When in Redundant Cable mode, each node independently decides whether to use channel A or channel B. This decision is based on error counters internal to each node. Redundant cabling is only valid if there is only one fault on the network. In other words, if you have a proper redundant cabling system and you remove node 3 on trunk A and node 4 on trunk B, the system will not operate correctly because a double failure has occurred.

Additional Resources

For more information, see the ControlNet Standard and High-flex Coax Cable Installation Instructions, publication 1786-IN009.

Figure 2 - Redundant Media System



1756 ControlNet Status Indicators

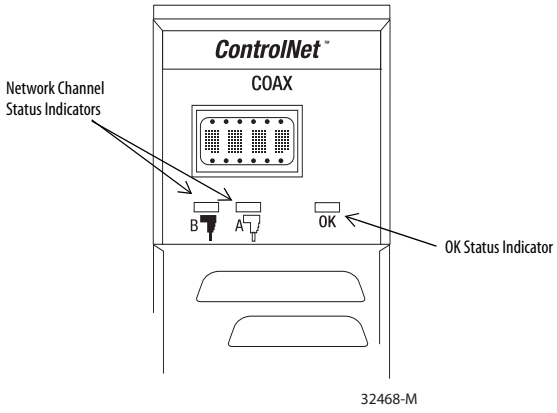
Topic	Page
1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK ControlNet Communication Modules	38
1756-CNB/E and 1756-CNBR/E ControlNet Communication Modules	43

The 1756 ControlNet communication modules and adapters support these status indicators.

Status Indicator	Description
OK status indicator	Indicates the module's current state.
Network channel status indicators	Indicates the status of network channels A and B.

Status Indicators

The 1756 ControlNet communication modules and adapters support these status indicators.



Status Indicator	Description
B	Indicates the Network Channel Status, Channel B.
A	Indicates the Network Channel Status, Channel A.
OK	OK, indicates the current state of the module.

Interpret the OK Status Indicator

IMPORTANT The OK status indicator reflects the module state, such as the running of a self-test, the updating of firmware, and normal operation without an established connection.

When you view the status indicators, always view the OK status indicator first to determine the state of the module. This information may help you to interpret the network channel status indicators. As a general practice, view all status indicators together to gain a full understanding of the module's status.

Interpret the Network Channel Status Indicators

The network channel status indicators appear in one of these states:

- Steady—The indicator is on continuously in the defined state.
- Alternating—The two indicators alternate between the two defined states at the same time (applies to both indicators viewed together). The two indicators are always in opposite states, out of phase.
- Flashing—The indicator alternates between the two defined states (applies to each indicator viewed independent of the other). If both indicators flash, they must flash together, in phase.

IMPORTANT When you connect the 1756-CNB/E and 1756-CNBR/E modules to a ControlNet network by using only the NAP, the channel A and channel B indicators are meaningless.

1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK ControlNet Communication Modules

This section provides the following information about status indicators:

- To understand the OK status indicator and display messages, refer to Table 1 on page 39.
- For information about viewing the network channel status indicators together, refer to Table 2 on page 42.
- For information about viewing the network channel status indicators individually, refer to Table 3 on page 42.

OK Status Indicator and Display

Table 1 - OK Status Indicator and Display

Status	Display	Description
Off	None	The module is not communicating due to a power supply fault or internal fault. Do any of the following: • Check the power supply. • Check the cable connectors. • Make sure the module is firmly seated in the chassis. • If the indicator remains off, replace the module.
Steady Red	Reset Complete—Change Switch Settings	The module's network address is set to 00, an invalid ControlNet address. Remove the module from the chassis, and set the network address to a valid value. For more information, see Install a 1756 ControlNet Communication Module on page 9.
	FAIL	This code is displayed when the power-up test fails. Replace the module.
	Backplane Init(1)	The module is waiting for the redundant module to complete powerup.
	Stop Service Received	A nonredundant module is placed into a redundant secondary chassis. The module was commanded to stop functioning by the redundancy module (RM2/RM/SRM). Remove the nonredundant module from the redundant secondary chassis, and then replace the nonredundant module with the redundant module.
		This could occur if a 1756-CN2 or 1756-CN2R module running Boot code is inserted into a chassis along with a 1756-SRM or 1756-RM module. For use in an enhanced redundancy system, the 1756-CN2/B or 1756-CN2/C modules are designed to interoperate with a 1756-RM or 1756-RM2 module. It should not be used with a 1756-SRM module. Insert the module into a chassis that does not contain a 1756-SRM, 1756-RM or 1756-RM2 module, and then update the module's firmware with ControlFLASH software.
Flashing red	Image update Needed	The Boot image is running. Update the module's firmware with ControlFLASH software.
	DUPLICATE NODE DETECTED	The module's network address is the same as another module's on the link. Remove the module from the chassis, and set the network address to a unique value. For more information, see Install a 1756 ControlNet Communication Module on page 9.
	Flash in progress	A firmware update is in progress.
		If communication to the module is lost during an update, this message will continue to be displayed even though the module will not be able to finish the update. Remove power from the module to recover, and then perform the update again.
	TEST	The module is executing a power-up test. If the display persists for more than 45 seconds, replace the module because it has failed.

Table 1 - OK Status Indicator and Display

Status	Display	Description
Steady Green	OK	This is normal operation. There is at least one connection to or through the module.
	INIT	The module is initializing.
	PASS	This message is displayed momentarily upon completion of a successful power-up test.
	CMPT(1)	The secondary module is compatible with its partner.
	DSNP(1)	The secondary module is disqualified with no partner. Check the corresponding slot of the primary chassis for the module type and revision.
	PwDS(1)	The module is primary with a disqualified secondary partner. Check the type and revision of the 1756-CN2/B module.
	PQgS(1)	The module is primary with a qualifying secondary partner.
	PwQS(1)	The module is primary with a qualified secondary partner.
	PwNS(1)	The module is primary with no secondary partner. Check corresponding slot of secondary chassis for correct module.
	QgS(1)	The secondary module is qualifying.
	QS(1)	The secondary module is qualified.
	A#*xx*	This message is the node address where *xx* is an address from 01...99.
	MACID SWITCH ERROR	Node address switch changed after you cycled power. We recommend that you either return switches to their original settings or replace the module, as this could indicate a latent hardware anomaly.
Steady green or flashing green	CPU=*xx*%	This message is the CPU utilization rate where *xx* is the amount of CPU used, ranging from 0...99%. This message occurs only if the CPU utilization exceeds 80%.
	OK	The module is operating normally.
Flashing green	OK	This is normal operation. No connections to or through the module exist.
	Invalid Network Configuration	ControlNet configuration error. Recheck the configuration. Verify that the module's network address is less than or equal to the maximum unscheduled network address (UMAX).
	NET ERR	A network cabling error exists, or there are no other active nodes on the network. Recheck your network cabling and make sure another node on the network is active (online).
	Rev *xx.xx*	When you start the module, its major and minor revisions are disclosed causing this message to briefly appear. The display shows these revisions where the major revision appears to the left of the decimal point, and the minor revision appears to the right.

Table 1 - OK Status Indicator and Display

Status	Display	Description
Any	Keeper: Unconfigured	The network configuration data maintained in memory by the keeper object has been erased or corrupted. Do any of the following: • Use RSNetWorx software to download or update the keeper object in the module. • Reset the module to the original factory settings, as described on page 14.
	Keeper: Unconfigured (data format changed)	The network configuration data maintained in memory by the keeper object is in a format incompatible with the current revision of firmware. Do any of the following: • Use RSNetWorx software to download or update the keeper object in the module. • Reset the module to the original factory settings, as described on page 14.
	Keeper: Unconfigured (slot changed)	After the keeper object's network-configuration data was downloaded, the module was moved to a different spot in the rack. Do any of the following: • Return the module to the proper slot. • Use RSNetWorx software to download or update the keeper object in the module. • Reset the module to the original factory settings, as described on page 14.
	Keeper: Unconfigured (net address changed)	The network address switches on the module have been changed since the keeper object's network-configuration data was downloaded. Do any of the following: • Return the network address switches to their original setting. • Use RSNetWorx software to download or update the keeper object in the module. • Reset the module to the original factory settings, as described on page 14.
	Keeper: Signature Mismatch	The network configuration data maintained in memory by the keeper object does not match the current network configuration. There is a valid active keeper on the network. Do any of the following: • Use RSNetWorx software to download or update the keeper object in the module. • Reset the module to the original factory settings, as described on page 14.
	Keeper: None Valid on Network	The network configuration data maintained in memory by the keeper object does not match the current network configuration, and there is no valid active keeper on the network. Use RSNetWorx software to download or update the keeper object in the module. **Important:** The Install the Module on page 14 procedure does not work. There is no valid active keeper from which to crossload data.

(1) ControlLogix enhanced redundancy systems only.

Network Channel Status Indicators

Table 2 - Network Channel Status Indicators A and B

Status	Description
Off	There is no power.
Steady red	Unit has faulted. Cycle power or reset unit. If the fault persists, contact a Rockwell Automation representative or distributor.
Alternating red/green	A self-test is being conducted.
Alternating red/off	Node has been configured incorrectly. Check network address and other ControlNet configuration parameters.

Table 3 - Network Channel Status Indicators A or B

Status	Description
Off	Channel has been disabled. Program the network for redundant media, if required.
Steady green	This is normal operation.
Flashing green/off	Temporary errors exist. The unit will self-correct.
	Node is not configured to go online. Make sure that the configuration manager node (keeper) is present and working and the selected address is not greater than the maximum unscheduled node address (UMAX).(1)
Flashing red/off	A media fault exists. Check media for broken cables, loose connectors, or missing terminators.
	No other nodes are present on the network. Add other nodes to the network.

(1) The configuration manager node (keeper) is the node responsible for distributing ControlNet configuration data to all nodes on the network.

1756-CNB/E and 1756-CNBR/E ControlNet Communication Modules

This section provides the following information about status indicators:

- To understand the OK status indicator and display messages, see Table 4.
- For information about viewing the network channel status indicators together, see Table 5 on page 46.
- For information about viewing the network channel status indicators individually, see Table 6 on page 46.

OK Status Indicator and Display

Table 4 - OK Status Indicator and Display

Status	Display	Description
Off	None	The module is not communicating due to a power supply fault or internal fault. Do any of the following: • Check the power supply. • Check the cable connectors. • Make sure the module is firmly seated in the chassis. • If the status indicator remains off, replace the module.
Steady red	Msg scrolls(1)	The module's network address is set to 00, an invalid ControlNet address, or 99, an invalid ControlNet address if you are using enhanced redundancy control. See the footnote at the end of the table. Remove the module from the chassis, and set the network address to a valid value. For more information, see Install a 1756 ControlNet Communication Module on page 9.
	BPA# ERR	The module has detected a different slot address from that latched in when the module was started. Excessive noise on the backplane causes this error. Replace the chassis or module.
	BPRX ERR	Too many CRC errors are being generated by the multicast backplane receiver, so the backplane multicast receivers have been shut off. Replace the module.
	BPIC ERR	Hardware within the module has faulted. Replace the module.
	CNIC ERR	
	DUPL NODE	For enhanced redundancy systems, this may be a temporary condition during chassis switchover. Otherwise, the module's network address is the same as another module's on the link. For enhanced redundancy systems only, wait 10 seconds. If the condition persists, remove the module from the chassis, and set the switches to a unique address. For more information, see Install a 1756 ControlNet Communication Module on page 9.
	RACK ERR	The module cannot read the backplane EEPROM, or the rack/slot address is incorrect. Replace the chassis.
	STOP	The 1756-CNB/E module was commanded to stop functioning by the redundancy module. This occurs when a non-redundancy-compliant 1756-CNB/E module is placed into a redundant secondary chassis. Remove the nonredundancy-compliant 1756-CNB/E module from the redundant secondary chassis and replace it with a redundant 1756-CNBR/E module.
	WAIT RM(2) or WAIT SRM(2)	The 1756-CNB/E module is waiting for the redundancy module to be started.
Flashing red	BOOT	The module has invalid firmware. Update the module's firmware with ControlFLASH software.
	ROM UPDT	A firmware update is in progress.
	SNGL KPR!	The module has detected that it has been connected to a ControlNet single-keeper network, version 1.0 or 1.25. Update the firmware of module at node address 01 and reschedule the network.

Table 4 - OK Status Indicator and Display (Continued)

Status	Display	Description
Steady green	OK	Normal operation is occurring. At least one connection has been made to or through the module.
	INIT	The module is initializing.
	BW >MAX	The module is receiving too much network traffic and connections are timing out. The network bandwidth has been exceeded. No action is required because this is a temporary condition. If this happens frequently, add another module and split the traffic between them.
	CMPT(2)	The secondary 1756-CNB/E module is compatible with its partner.
	DSNP(2)	The 1756-CNB/E module is disqualified without a partner. Check corresponding slot of primary chassis for type and revision of module.
	PwDS(2)	The 1756-CNB/E module is primary with a disqualified secondary partner. Check the type and revision of the module.
	PwQg(2)	The 1756-CNB/E module is primary with a qualifying secondary partner.
	PwQS(2)	The 1756-CNB/E module is primary with a qualified secondary partner.
	PwNS(2)	The 1756-CNB/E module is primary with no secondary partner. Check the corresponding slot of the secondary chassis for the correct module.
	Qfng(2)	The secondary 1756-CNB/E module is qualifying.
	QS(2)	The secondary 1756-CNB/E module is qualified.
	SW ERR	The node address switch changed after the module was started. We recommend that you either return the switches to their original settings or replace the module, since this condition could indicate a latent hardware anomaly.
Flashing green	CNFG ERR	The ControlNet network was configured incorrectly. Recheck the ControlNet network configuration.
	NET ERR	A network cabling error exists, or no other active nodes exist on the network. Recheck your network cabling and make sure another node on the network is active (online).
	OK	Normal operation is occurring. No connections have been made to or through the module.

Table 4 - OK Status Indicator and Display (Continued)

Status	Display	Description
Steady green or off	SO_1[2]	Old primary switchover phase 1 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	SO_2[2]	Old primary switchover phase 2 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	SO_3[2]	Old primary switchover phase 3 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	SN_1[2]	New primary switchover phase 1 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	SN_2[2]	New primary switchover phase 2 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	SN_3[2]	New primary switchover phase 3 is in progress. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	?Cpt[2]	The 1756-CNB/E module has not determined if it is compatible. If the display shows this message for more than 3 seconds, then the 1756-CNB/E module failed during transition from one redundancy phase to another. Replace one or both redundancy modules.
	!Cpt[2]	The 1756-CNB/E module has determined that it is not compatible. Replace the 1756-CNB/E module with one of the correct type and revision.

(1) If switches are set to 00, the display scrolls 'FAULT: ADDRESS SWITCHES = 00, ILLEGAL'. If switches are set to 99 in a redundant chassis pair, the display scrolls 'FAULT: ADDRESS SWITCHES = 99, ILLEGAL IN REDUNDANT SYSTEM'.

(2) ControlLogix redundancy systems only.

Network Channel Status Indicators

Table 5 - Network Channel Status Indicators A and B

Status	Description
Off	There is no power.
Steady red	The module has faulted. Cycle power to the module. If the fault persists, contact your Rockwell Automation representative or distributor.
Alternating red/green	The module is undergoing a self-test.
Alternating red/off	A node was configured incorrectly, or a duplicate ControlNet node address exists. Check the node address and other ControlNet module configuration parameters.

Table 6 - Network Channel Status Indicators A or B

Status	Description
Off	A channel has been disabled. Program the network for redundant media, if necessary.
Steady green	Normal operation is occurring.
Flashing green/off	Temporary network errors exist. Check media for broken cables, loose connectors, and missing terminators. If the condition persists, see the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002.
	The node is not configured to go online. Make sure the network keeper is present and working, and that the selected address is less than or equal to the UMAX(1).
Flashing red/off	Media has faulted. Check media for broken cables, loose connectors, and missing terminators. If the condition persists, see the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002.
	No other nodes are present on the network. Add other nodes to the network.
Flashing red/green	An incorrect node address exists. Change the node address so that it is less than or equal to the UMAX(1). Then, stop and restart the 1784-PCIC and 1784-PCICS cards in RSLinx software.
	The ControlNet network was configured incorrectly. Reconfigure the ControlNet network so that the UMAX(1) is greater than or equal to the node address.

(1) UMAX is the highest node address on a ControlNet network that can transmit data.

USB Communication

The 1756-CN2, 1756-CN2R, 1756-CN2RXT and 1756-CN2RK ControlNet modules support USB communication.

Set Up a USB Driver

To configure RSLinx software to use a USB port, you need to first set up a USB driver. Before you begin, make sure you have the correct version of RSLinx software.

Table 7 - RSLinx Software Versions

ControlNet Module	Required Version of RSLinx Software
1756-CN2RXT or 1756-CN2RK	2.55 or later
1756-CN2/C or 1756-CN2R/C	2.55 or later
1756-CN2/B or 1756-CN2R/B	2.51 or later

To set up a USB driver, perform this procedure.

1. Connect your ControlNet module to your computer by installing a USB cable in your module's USB port.

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

ATTENTION: The USB port is intended only for temporary local programming purposes 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.

The RSLinx Found New Hardware Wizard dialog box appears.

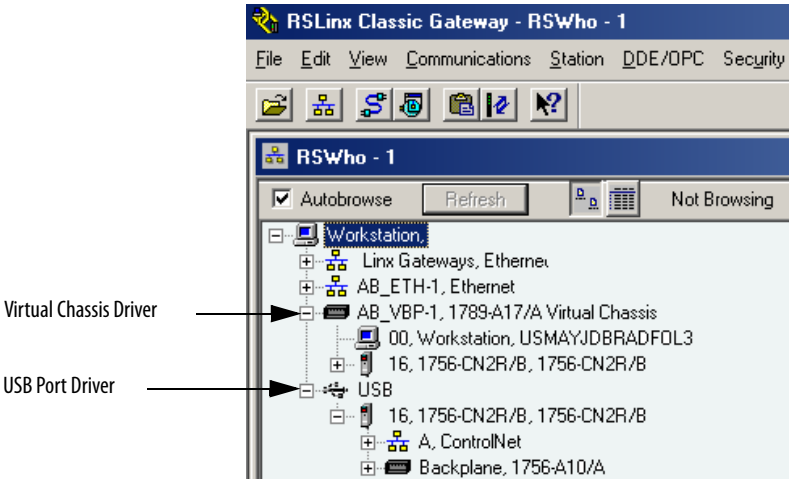
2. Click Install the software automatically (Recommended), and then click Next.

The following dialog boxes appear consecutively.

3. Click Finish to set up your USB driver.

4. From the Communications pull-down menu, choose RSWho to view modules in RSLinx software.

   The RSLinx Workstation organizer appears.



   Your ControlNet modules appear under two different drivers, a virtual chassis and the USB port. You can use either driver to browse through your ControlNet modules.

Notes:

1768 ControlNet Module Status Indicators

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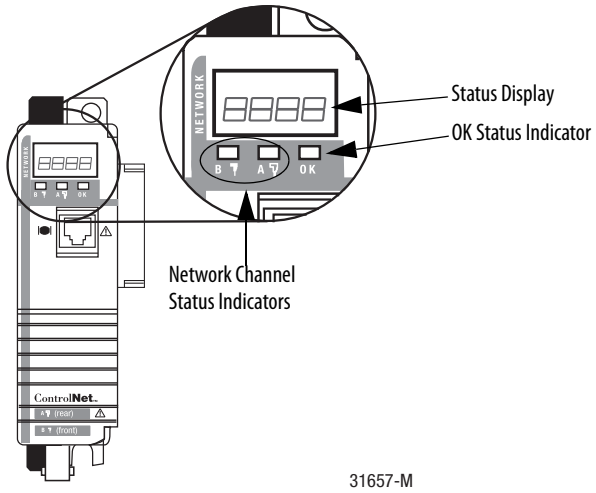
The 1768 ControlNet communication modules support these status indicators.

Status Indicator	Description
OK status indicator	Indicates the module's current state.
Network channel status indicators	Indicates the status of network channels A and B.



1768-CNB and 1768-CNBR ControlNet Modules

This section provides the following information about status indicators:

- To understand the OK status indicator and display messages, see Table 7 on page 52.
- For information about viewing the network channel status indicators individually, see Table 8 on page 53.

OK Status Indicator and Display

Table 7 - OK Status Indicator and Display

Status	Display	Description
Off	None	The module is not communicating due to a power supply fault or internal fault. Do any of the following: • Check the power supply. • Check the cable connectors. • Make sure the module is firmly seated in the chassis. • Replace the module if the indicator remains off.
Steady red	Msg scrolls	The module's network address is set to 00, an invalid ControlNet network address. If switches are set to 00, the display scrolls FAULT: ADDRESS SWITCHES = 00, ILLEGAL. Remove the module from the chassis, and set the network address to a valid value. For more information, see Install a 1768 ControlNet Communication Module on page 23.
	BPA# ERR	The module detected a different slot address from that latched in when you cycled power. Excessive noise on the backplane causes this error. Replace the chassis or module.
	BPRX ERR	There are too many CRC errors being generated by the multicast backplane receiver, so the backplane multicast receivers have been shut off. Replace the module.
	BPIC ERR	There is a hardware fault within the module. Replace the module.
	CNIC ERR	
	DUPL NODE	The module's network address is the same as another module's on the link. Remove the module from the chassis, and set the network address to a unique value. For more information, see Install a 1768 ControlNet Communication Module on page 23.
	RACK ERR	The module cannot read backplane EEPROM, or the rack/slot address is incorrect. Replace the chassis.
Flashing red	BOOT	The module has invalid firmware. Update the module's firmware with ControlFLASH software.
	ROM UPDT	An update is in progress.
	SNGL KPR!	The module detected that it has been connected to a ControlNet single-keeper network, version 1.5. Update the module's firmware at MAC ID 01 and reschedule the network.
Steady green	OK	Normal operation is occurring.
	INIT	The module is initializing.
	BW > MAX	The module is receiving too much network traffic and connections are timing out. The network bandwidth has been exceeded. If this happens frequently, add another 1768-CNB or 1768-CNBR module and split the traffic between them.
	SW ERR	The node address switch changed after cycling power. We recommend that you either return switches to their original settings or replace the module as this could indicate a hardware anomaly.
Flashing green	CNFG ERR	There is a ControlNet network configuration error. Recheck the configuration.
	NET ERR	There is a network cabling error or there are no other active nodes on the network. Recheck your network cabling and make sure another node on the network is active (online).

Network Channel Status Indicators

The ControlNet network channel-status indicators appear in one of these states:

- Steady—The indicator is on continuously in the defined state.
- Alternating—The two indicators alternate between the two defined states at the same time (applies to both indicators viewed together). The two indicators are always in opposite states, out of phase.
- Flashing—The indicator alternates between the two defined states (applies to each indicator viewed independent of the other). If both indicators are flashing, they must flash together, in phase.

Table 8 - Network Channel Status Indicators A or B

Status	Description
Off	There is no power.
Steady red	The module has faulted. Cycle power to the module. If the fault persists, contact your Rockwell Automation representative or distributor.
Alternating red/green	The module is undergoing a self-test.
Alternating red/off	A node was configured incorrectly, or a duplicate ControlNet node address exists. Check the node address and other ControlNet module configuration parameters.
Off	A channel has been disabled. Program the network for redundant media, if necessary.
Steady green	Normal operation is occurring.
Flashing green/off	Temporary network errors exist.
	The node is not configured to go online. Make sure the network keeper is present and working, and that the selected address is less than or equal to the UMAX(1).
Flashing red/off	Media has faulted. Check media for broken cables, loose connectors, and missing terminators. If the condition persists, see the ControlNet Coax Media Planning and Installation Guide, publication CNET-IN002.
	No other nodes are present on the network. Add other nodes to the network.
Flashing red/green	The ControlNet network was configured incorrectly. Cycle power or reset the module. If the fault persists, contact your Rockwell Automation representative or distributor.

(1) UMAX is the highest node address on a ControlNet network that can transmit data.

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Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

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