Allen-Bradley 1756-RM2 Control Logix Redundancy Modules

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Important Information

A redundant system is composed of two ControlLogix® redundancy modules working together that supervise the operating states and state transitions that establish the basic framework for redundancy operations. The redundant pairs provide a bridge between chassis pairs that let other modules exchange control data and synchronize their operations.

⚠ **ATTENTION:** 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.

Product Advisories

Environment and Enclosure

⚠ **ATTENTION:** 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, Rockwell Automation 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 enclosure

Prevent Electrostatic Discharge

⚠ **ATTENTION:** 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.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations.

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.

⚠ **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.

UK and European Hazardous Location Approval

The following applies to products marked  , II 3 G. Such modules:

- Are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Annex II to EU Directive 2014/34/EU and Schedule 1 of the UKEX Regulation 2016 No. 1107. See the UKEX and EU Declaration of Conformity at rok.auto/certifications for details.
- The type of protection is Equipment protection by increased safety “e”.
- Equipment protection by increased safety “e”, reference certificate number UL22ATEX2818X and UL22UKEX2604X.
- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to UKEX Regulation 2016 No. 1107 and ATEX directive 2014/34/EU.

IEC Hazardous Location Approval

The following applies to products with IECEx certification. Such products:

- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification.
- The type of protection is <Ex ec IIC T4 Gc>.
- IECEx certificate number IECEx UL 22.0063X.

Special Conditions for Safe Use

⚠ **WARNING:**

- This equipment is not resistant to sunlight or other sources of UV radiation.
- This equipment shall be mounted in an UKEX/ATEX/IECEx Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (in accordance with EN/IEC 60079-0) and used in an environment of not more than Pollution Degree 2 (as defined in EN/IEC 60664-1) when applied in Zone 2 environments. 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.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The instructions in the user manual shall be observed.
- This equipment must be used only with UKEX/ATEX/IECEx 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.
- The USB port is intended for temporary local programming purposes only and not intended for permanent connection. Do not use the USB port in hazardous locations.

Removal and Insertion Under Power (RIUP)

⚠ **WARNING:** When you insert or remove the module or the small form-factor pluggable (SFP) optical transceiver 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.

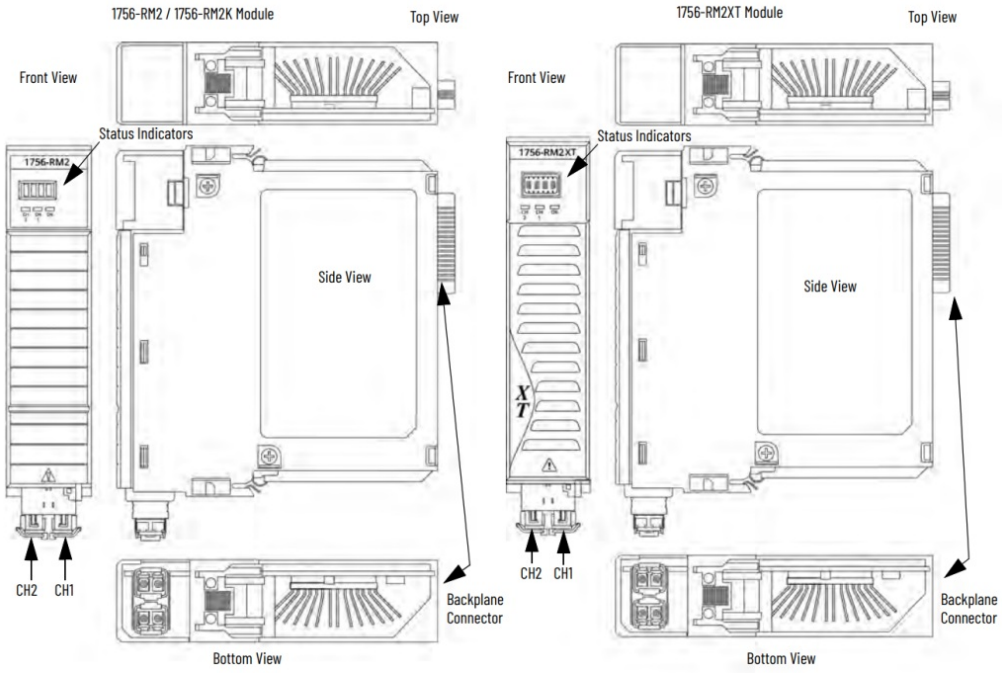
⚠ **ATTENTION:** Personnel responsible for the application of safety-related programmable electronic systems (PES) shall be aware of the safety requirements in the application of the system and shall be trained in using the system.

⚠ **ATTENTION:** Under certain conditions, viewing the optical port may expose the eye to hazard. When viewed under some conditions, the optical port may expose the eye beyond the maximum permissible-exposure recommendations.

⚠ **ATTENTION:** Class 1 laser product. Laser radiation is present when the system is open and interlocks bypassed. Only trained and qualified personnel are allowed to

install, replace, or service this equipment.

Module Overviews



SFP transceivers are pre-installed in the redundant fiber ports.

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

Before You Begin

Complete these tasks before you install the enhanced redundancy system:

- Verify that you have the components required to install your system.
- Read and understand the safety and environmental considerations explained in each component’s installation instruction publication.
- Order a 1756-RMCx fiber-optic communication cable if you don’t have one.

Determine the Optical Power Budget

You can determine the maximum optical-power budget in decibels (dB) for a fiberoptic link by computing the difference between the minimum transmitter-output optical power (dBm avg) and the lowest receiver sensitivity (dBm avg)

Transmitter	Min	Typical	Max	Unit
Output optical power	-9.5	—	-3	dBm
Wavelength	1270	—	1355	nm
Receiver	**Min**	**Typical**	**Max**	**Unit**
Receiver sensitivity	—	—	-19	dBm
Receiver overload	—	—	-3	dBm
Input operating wavelength	1270	—	1355	nm

Installation Instructions

Install the Hardware

Follow these steps to set up and install your system's hardware components.

⚠ **ATTENTION:** The ControlLogix Redundancy Modules that are listed above of this task that end with a 'K' or are shipped with port protection plugs installed to provide a layer of protection from corrosive atmospheres. Port plugs must remain installed in unused ports at all times during storage and operation for the product to meet its corrosive atmosphere rating. If temporary access is required, plugs can be removed, and should be reinserted after temporary access is complete.

Installation Requirements

Before you install the module, be sure to note the following:

- Understand redundant systems and redundant media.
  Verify that the planned modules for each redundant chassis of the pair are identical – including firmware revisions.
- Verify that your enhanced redundancy firmware revision is compatible with your planned redundant chassis modules.
- You must install one redundancy module in each chassis that is planned for your

system.

- 1756-RM2 or 1756-RM2XT modules can only be used with other 1756-RM2 or 1756-RM2XT modules.
- XT modules must use an XT chassis.

IMPORTANT

If you are adding redundancy to an already operational ControlLogix system, shut off your process to install the redundancy module. The first chassis that you install the redundancy module into and turn on, becomes the primary chassis.

You also have to enable redundancy in the programming software and remove any I/O modules from the chassis.

Install the First Chassis and Its Components

When you install an enhanced redundancy system, install one chassis, and its necessary components, at a time.

Module Placement and Partnering

Each pair of controllers and communication modules must be comprised of compatible partner modules. Two modules in the same slot are considered as compatible partners only if they contain compatible hardware and firmware and other rules that can be enforced by the module itself.

The compatibility status (Compatible or Incompatible) is determined by either the module in the primary chassis or its partner in the secondary chassis.

The redundancy module pair must occupy the same slots in their respective chassis. The redundancy module pair does not consider the chassis pair to be partnered if the redundancy modules are placed in different slots, even if the partners of other modules are present in the same slot.

The redundancy module prevents certain redundancy operations, such as Qualification, if incompatible modules reside in the redundant-control chassis pair.

IMPORTANT For best performance, place the redundancy module in the chassis as close as possible to the controller.

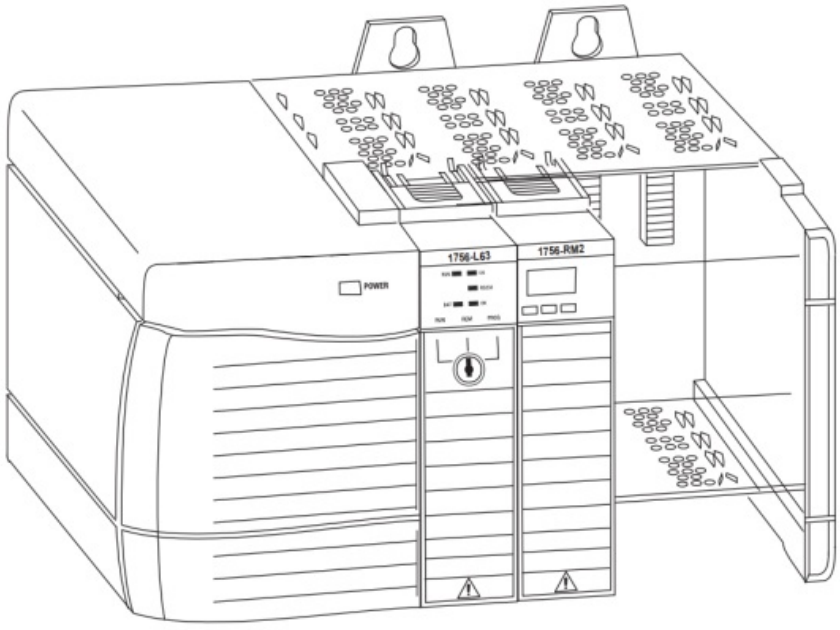
Do not apply power to the system until both chassis and their components are installed.

1. Install the chassis and power supply.
2. Install the communication modules.
3. Install a controller.
4. Install the redundancy module.

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

   b. Slide the module into the chassis and make sure that the module backplane connector properly connects to the chassis backplane.

   The module should appear flush with other installed modules.



5. The first chassis and its components are now installed. Chassis power must remain off.
6. Once the first chassis and its components are installed, follow the same steps to install the second chassis of the redundant chassis pair.

IMPORTANT The components that are used in the first and second chassis must match exactly for the system to synchronize.

IMPORTANT To remove the module, push the locking clips at the top and bottom of each module and slide the module out of the chassis.

Connect the Redundancy Modules via a Fiber-optic Cable

IMPORTANT Do not connect the primary redundancy module to the secondary redundancy module until all other components that are used in the redundant chassis pair are installed, updated to the correct firmware revision, and configured.

Once the **first and second chassis and their components are installed**, you connect the redundancy modules via the 1756-RMCx fiber-optic communication cable. The cable is not included with the redundancy module. Before installation, order this fiber-optic communication cable separately.

The following redundancy cables are available from Rockwell Automation:

Fiber Cable Cat. No.	Length
1756-RMC1	1 m (3.28 ft)
1756-RMC3	3 m (9.84 ft)
1756-RMC10	10 m (32.81 ft)

The cable connection is made at the bottom of the module in a downward orientation. There is enough space between the transmit and receive connectors so you can use the LC connector coupler. The use of this coupler keeps the fiberoptic cable from bending so you can connect and disconnect the cable without removing the module from the chassis.

⚠ **ATTENTION:** Consider these points when connecting the fiber-optic cable:

- The redundancy module communication cable contains optical fibers. Avoid making sharp bends in the cable. Install the cable in a location where it will not be cut, run over, abraded, or otherwise damaged.
- The redundancy module contains a single-mode transmitter. If you connect this

module to a multimode port, it can damage multimode devices.

- 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.
- Media redundancy is achieved by installing modules with redundant ports and installing a redundant fiber cable system. If a cable failure occurs, or a cable is degraded, the system uses the redundant network.
- When using a redundant system, route the two trunk cables (A and B) so that damage to one cable will not damage the other cable. This reduces the risk of both cables being damaged simultaneously.
- Redundant cabling can tolerate one or more faults on a single channel. If a fault occurs on both channels, the network operation is unpredictable.

Connect the Fiber-optic Communication Cable to the Redundancy Modules

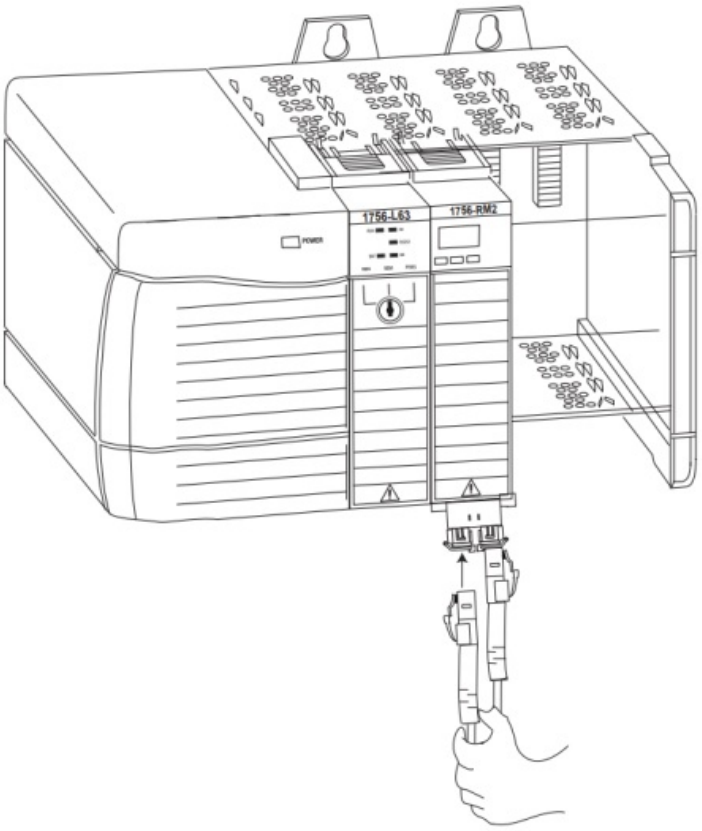
Follow this procedure to install the fiber-optic communication cable to the channels of the redundancy module.

IMPORTANT The redundancy module communication cable contains optical fibers. Avoid making sharp bends in the cable. Install the cable in a location where it cannot be cut, run over, abraded, or otherwise damaged.

If redundant channels between the redundancy modules are required, repeat the installation process for the unused port (CH1 or CH2) with a different fiber cable.

1. Remove the black protective channel cover on the first redundancy module in the redundant chassis pair.
2. Remove the protective caps from the cable ends.
3. Plug the cable connector into the CH1 or CH2 port on the first redundancy module.
4. Plug the other end of the cable into a channel on the secondary module.

 We recommend that you match channel to channel, CH1 to CH1 and CH2 to CH2, for troubleshooting simplicity, but this match is not required.



IMPORTANT The redundancy module communication cable contains optical fibers. Avoid making sharp bends in the cable. Install the cable in a location where it cannot be cut, run over, abraded, or otherwise damaged.

Specifications

Attribute	**1756-RM2, 1756-RM2K**	**1756-RM2XT**
Connector type	LC-type (fiber-optic)	
Cable type	8.5/125 mm single-mode fiber-optic cable	
Channels	1 (transmit and receive fiber)	
Length, max	10 km (10,000 m, 10,936.13 yd)	
Transmission	1000 Mbps	
Wavelength	1310 nm	

SFP transceiver	Transceiver Rockwell Automation PN-91972 Connector/ cable: LC duplex connector, 1000BASE-LX-compliant	
Temperature, operating	0…60 °C (32…140 °F)	-25…+70 °C (-13…+158 °F)
Corrosive Atmosphere(1) • ASTM B845-97 Method H Accelerated Test (20-Day Exposure)	Severity Level G3(2) per ANSI/ISA 71.04–2013, Airborne Contaminants—Gases Severity Level CX(2)(3) per IEC 60721-3-3:2019, Chemically Active Substances	
Temperature code	T4	
Power from system backplane	1.16 A at 5.1V DC 3.4 mA at 24V DC	1.16 A at 5.1V DC 3.4 mA at 24V DC

1. Only applicable to modules that end with a ‘K and ‘XT’.
2. Port Plugs must remain installed in unused ports at all times during storage and operation for the product to meet its corrosive atmosphere rating.
3. Up to 9.6 microns per year, corrosion rate of copper.

Additional Resources

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

Resource	Description
1756 Communication Modules Specifications Technical Data, publication 1756-TD003	Describes Ethernet communication module specifications.

ControlLogix 5570/5560 Redundancy User Manual, publication 1756-UM535	Provides design, installation, configuration, programming, monitoring, and troubleshooting information about the ControlLogix Enhanced Redundancy System.
ControlLogix 5580 Redundant Controller User Manual, publication 1756-UM015	Describes how to install, configure, program, operate, and troubleshoot a ControlLogix 5580 redundancy system.
ControlLogix Power Supply Installation Instructions, publication 1756-IN619	Describes how to install standard power supplies.
ControlLogix Redundant Power Supply Installation Instructions, publication 1756-IN620	Describes how to install redundant power supplies.
ControlLogix Chassis Installation Instructions, publication 1756-IN621	Describes how to install ControlLogix chassis.
ControlLogix ControlNet Communication Modules Installation Instructions, publication 1756-IN074	Describes how to install the ControlLogix ControlNet® bridge for redundant media.
ControlLogix ControlNet Scanner Module Installation Instructions, publication 1756-IN066	Describes how to install ControlLogix ControlNet scanner modules.
1756 EtherNet/IP Communication Modules, publication 1756-IN050	Provides installation, configuration, and USB communication information for EtherNet/IP™ Modules.
ControlLogix System User Manual, publication 1756-UM001	Provides instructions for installation and use of ControlLogix 5560 and 5570 Systems, application design and other general information for these systems.

ControlLogix 5580 and GuardLogix 5580 Controllers User Manual, publication 1756-UM543	Provides information on how to configure, select I/O modules, manage communication, develop applications, and troubleshoot the ControlLogix 5580 controllers.

You can view or download publications at rok.auto/literature.

Rockwell Automation Support

Use these resources to access support information.

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

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)

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

Customer Support

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

Rockwell Automation Trading Inc. Kar Plaza Business Center, Block E, **Floor:** 6, 34752 İçerenköy, Istanbul, **Tel:** +90 (216) 5698400 Complies with the EEE Regulation

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Publication 1756-IN087C-EN-P – June 2024 | Supersedes Publication 1756-IN087B-EN-P – April 2021

Documents / Resources

	Allen-Bradley 1756-RM2 Control Logix Redundancy Modules [pdf] Installation Guide 1756-RM2, 1756-RM2K, 1756-RM2XT, 1756-RM2 Control Logix Redundancy Modules, 1756-RM2, Control Logix Redundancy Modules, Logix Redundancy Modules, Redundancy Modules

References

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Allen-Bradley 1734-ACNR POINT I-O ControlNet Adapter Installation Guide
Next Post—
Allen Bradley 1734-OB2EP Protected Digital DC Output Module Instruction Manual

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