

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Amikon cover with selected official Rockwell Automation pages

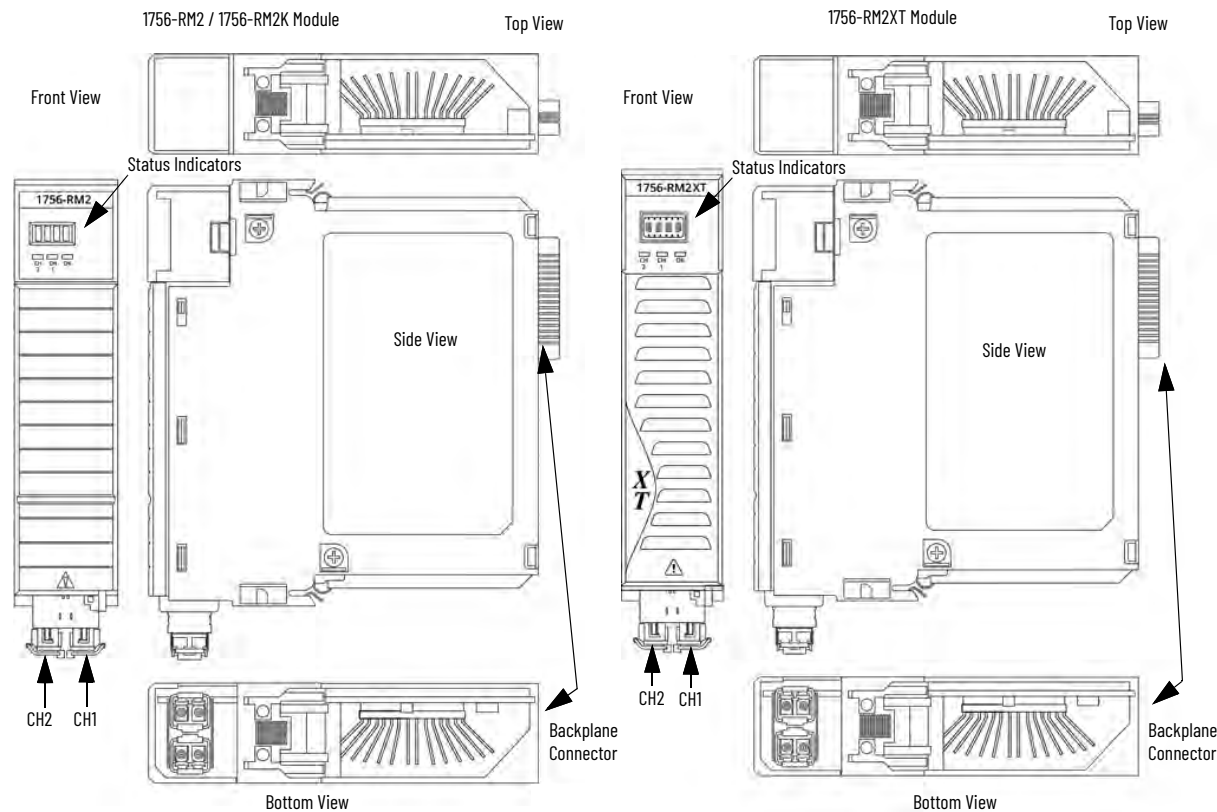
ALLEN-BRADLEY CONTROLLOGIX-XT

1756-RM2XT

REDUNDANCY MODULE

Selected official pages cover system requirements, module placement, fiber connection, specifications and redundancy operation.

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 fiber-optic 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

Install the Hardware

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



ATTENTION: The ControlLogix Redundancy Modules that are listed on [page 1](#) of this document 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.

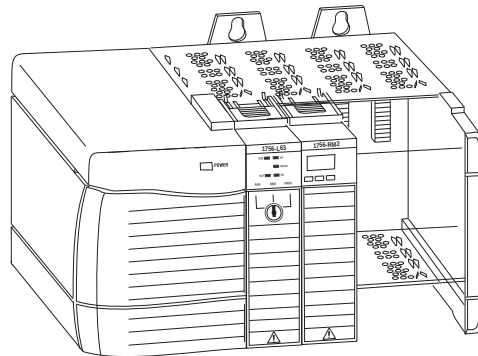
The redundancy module prevents certain redundancy operations, such as Qualification, if incompatible modules reside in the redundant-control chassis pair.

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 fiber-optic 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.

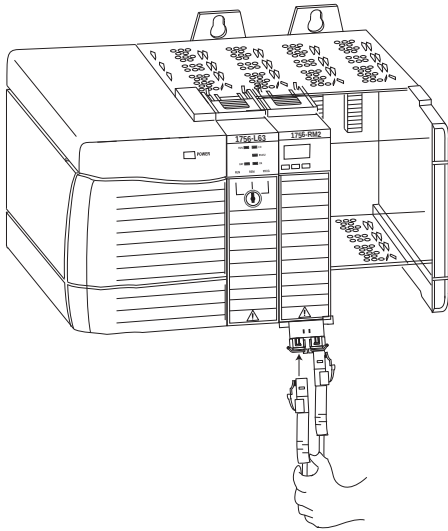
IMPORTANT The redundancy module communication cable contains optical fibers. Avoid making sharp bends in the cable. Install the cable in a location where it cannot be cut, run over, abraded, or otherwise damaged.

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 μ m 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.

1756-RM2 Redundancy Modules

Technical Specifications - 1756-RM2 Redundancy Modules

Attribute	1756-RM2, 1756-RM2K	1756-RM2XT
Current draw @ 5.1V DC	1.16 A	1.16 A
Current draw @ 24V DC	3.4 mA	3.4 mA
Power dissipation	6 W, max	6 W, max
Thermal dissipation	21 BTU/hr	21 BTU/hr
Connector cables	1756-RMC1, 1 m (3.28 ft) 1756-RMC3, 3 m (9.84 ft) 1756-RMC10, 10 m (32.81 ft)	1756-RMC1, 1 m (3.28 ft) 1756-RMC3, 3 m (9.84 ft) 1756-RMC10, 10 m (32.81 ft)
Slot width	1 slot	1 slot
Module location	Chassis-based, any slot	Chassis-based, any slot
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17	1756-A7XT, 1756-A10XT
Controller families, supported	ControlLogix 5570, ControlLogix 5580	ControlLogix 5570, ControlLogix 5580
Power supply, standard	1756-PA72, 1756-PA75, 1756-PB72, 1756-PB75	1756-PAXT, 1756-PBXT
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2	None
Temperature code	T4	T4
Enclosure type	None (open-style)	None (open-style)
Weight, approx	0.29 kg (0.64 lb)	0.29 kg (0.64 lb)
Mounting	Standard ControlLogix chassis, single-slot module	ControlLogix-XT chassis, single-slot module

Environmental Specifications - 1756-RM2 Redundancy Modules

Attribute	1756-RM2, 1756-RM2K	1756-RM2XT
Temperature, operating IEC 60068-2-1 (Test Ae, Operating Cold), IEC 60068-2-2 (Test Be, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)	-25...+70 °C (-13...+158 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing	5...95% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating)	
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock)	
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock)	
Emissions	IEC 61000-6-4	
ESD immunity	IEC 61000-4-2	
Radiated RF immunity	IEC 61000-4-3	