

Redundancy Module Requirements

A pair of redundancy modules is required to link the redundancy chassis pair. Place one redundancy module in the same slot of each redundant chassis. The partner redundancy modules monitor events in each chassis and initiate system responses as required.

IMPORTANT Use only direct, end-to-end connections between the fiber ports of partner redundancy modules. For example, do not use the fiber ports on a redundancy module to connect to a Stratix® switch or other device.

Partner redundancy modules must have the same catalog number.

Table 5 - Supported Redundancy Modules

Redundancy System	Cat. No.
Logix SIS	1756-RM3, 1756-RM3XT, 1756-RM2, 1756-RM2XT
ControlLogix 5580	1756-RM3, 1756-RM3XT, 1756-RM2, 1756-RM2XT
ControlLogix 5570	1756-RM3, 1756-RM3XT, 1756-RM2, 1756-RM2XT, 1756-RM

The 1756-RM3-2SFP module is functionality equivalent to a 1756-RM3 module but comes with two small form-factor pluggable (SFP) fiber-optic transceivers. The 1756-RM3-2SFP module is intended to be one catalog number for a functional replacement of a 1756-RM2 module in an existing redundancy system.

For redundancy module and accessory specifications, see the ControlLogix and GuardLogix Controllers Technical Data, publication [1756-TD001](#).

EtherNet/IP Features

Redundancy modules support the following EtherNet/IP features. For information about these EtherNet/IP features, see [Configure Redundancy Modules](#).

Table 6 - Redundancy Module EtherNet/IP Features

Cat. No.	Features			
	Communication Rate, Max	Protected Mode	Fiber Security	CIP Sync™
1756-RM3, 1756-RM3XT	1000 Mbps	Yes	Yes	Yes
1756-RM2, 1756-RM2XT	1000 Mbps	No	No	No
1756-RM	100 Mbps	No	No	No

Redundancy Status Bit

In Logix SIS and ControlLogix® 5580 systems, you can determine if your system is operating with redundancy by using the Redundancy Status bit (S:R). You can use the bit in standard or safety task logic. The bit can monitor the system while the controller is in Run or Test mode.

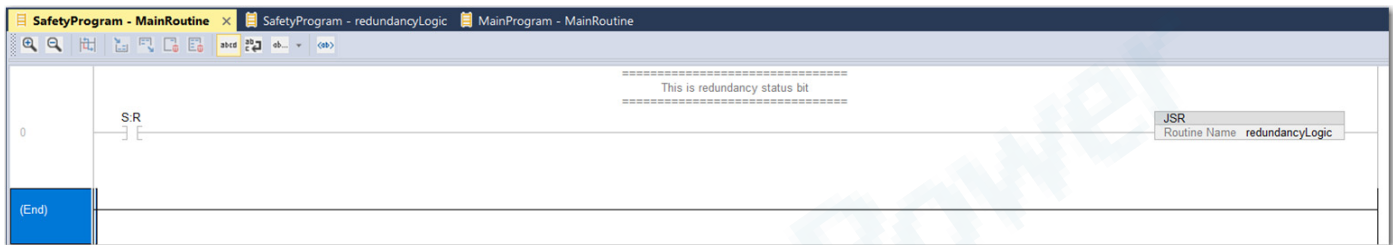
S:R Bit Status	Redundancy Status
On (1)	The system is operating with redundancy.
Off (0)	The system operating without redundancy.

IMPORTANT

When the S:R bit turns Off in a safety task that supports a SIL 3 safety function, you must repair the system within your specified mean repair time (MRT). If the system is not repaired within the MRT, you must take a specified action to maintain or achieve a safe state.

For MRT requirements, see the Logix SIS Safety Reference Manual, publication [1756-RM015](#).

Figure 60 - Redundancy Status Bit



(1756-RM2 and 1756-RM Modules Only) Fiber Channel Status via MSG Instruction

You can use an MSG instruction to access the status of the fiber channels on the 1756-RM2 and 1756-RM redundancy modules.

1. In the program for the redundant controller, create an MSG instruction.
2. On the Communication tab of the Message Configuration dialog box, configure a path of THIS to the redundancy module.
3. On the Configuration tab of the Message Configuration dialog box, enter the following parameters.

Parameter	Value
Message Type	CIP Generic
Service Type	Get Attribute Single
Class	305
Instance	1
Attribute	4E (Channel 1) 4F (Channel 2)

4. Download and test the MSG instruction.

The return value is a signed DINT. See the following table for status value definitions.

Parameter	Value
1	The channel is active.
2	The channel is operating as a redundant channel.
3	The connection is down.
4	The transceiver is not installed.
5	The transceiver failed.
7	Unknown

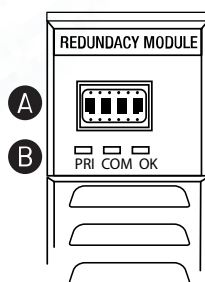
(1) Can be present for either CH1 or CH2, but not both simultaneously.

Table 70 - 1756-RM2 Status Indicators

Indicator	Status	Description
OK	Off	No power is applied to the redundancy module. If necessary, apply power.
	Steady red	One of these conditions exists: - The redundancy module is conducting a self-test during powerup. No action is necessary. - The redundancy module has experienced a major shutdown fault. Cycle power to clear the fault. If the major fault does not clear, replace the module.
	Flashing red	One of these conditions exists: - The redundancy module is updating its firmware. No action is necessary. - The redundancy module has been configured improperly. Check the module configuration and correct any issues. - The redundancy module has experienced a major fault that can be cleared remotely using the RMCT.
	Steady green	The redundancy module is operating normally. No action is required.
	Flashing green	The redundancy module is operating normally but is not communicating with the other redundancy modules in the same chassis. If necessary, establish communication with the other redundancy module.
CH1/CH2	Off	One of these conditions exists: - No power - RM major fault - NVS update
	Steady green ⁽¹⁾	Channel is operating as the active channel.
	Steady red	One of these conditions exists: - No transceiver plugged in - Faulted or failed transceiver detected - Transceiver with incorrect or vendor ID detected
	Intermittent red	For 1 s, then off, indicates powerup.
	Flashing red	One of these conditions exists: - Redundant channel error - No cable connection
	Intermittent green ⁽¹⁾	On for 256 ms for each packet that is received, then off. Active operating channel. (Channel that is used for data communication between the partner 1756-RM2 modules.)
	Flashing green ⁽¹⁾	The channel is operating as the back-up channel and is ready to become the Active channel if the current Active channel fails.

(1) Can be present for either CH1 or CH2, but not both simultaneously.

1756-RM Status Indicators



Item	Description
A	Status messages—Provide diagnostic information.
B	Status indicators: - PRI—Indicates whether the module is functioning as the primary module. - COM—Indicates state of communication between the redundant chassis pair. - OK—Indicates the current state of the redundancy module.

Table 71 - 1756-RM Status Messages

Message	Description
Txxx	The redundancy module is executing a self-test at power-up. (xxx represents a hexadecimal test identification number.) Wait for the self-test to finish. No action is required.
XFER	Application firmware update is in progress. Wait for the firmware update to finish. No action is required.
ERAS	Boot mode - Erasing current redundancy module firmware.
PROG	Boot mode - Updating redundancy module firmware. Wait for the firmware update to finish. No action is required.
????	Resolving initial redundancy module state. Wait for the state resolution to finish. No action is required.
PRIM	Primary redundancy module. The module is operating as the primary module. No action is required.
DISQ	Disqualified secondary redundancy module. Check the type and revision of the secondary partner module.
QFNG	Qualifying secondary redundancy module. Redundant system status. No action is required.
SYNC	Qualified secondary redundancy module. Redundant system status. No action is required.
LKNG	Secondary redundancy module that is in the process of locking for update.
LOCK	Secondary redundancy module that is locked for update.
Exxx	Major fault has occurred (xxx represents an error or fault code, with the two least-significant characters in decimal). Use the Error ID code to diagnose and address the error.
EEPROM Update Required	Onboard EEPROM is empty. Replace the module.
BOOT Erase Error	Error in erasing NVS device while updating boot image. Cycle power to the module. If the error persists, replace the module.
BOOT Program Error	Error in writing in NVS device while updating boot image. Cycle power to the module. If the error persists, replace the module.
APP Erase Error	Error in erasing NVS device while updating application image. Cycle power to the redundancy module. If the error persists, replace the module.
APP Program Error	Error in writing in NVS device while updating application image. Cycle power to the redundancy module. If the error persists, replace the module.
CONFIG Erase Error	Error in erasing NVS device while updating configuration log image. Cycle power to the redundancy module. If the error persists, replace the module.
CONFIG Program Error	Error in writing in NVS device while updating configuration log image. Cycle power to the redundancy module. If the error persists, replace the module.
EEPROM Write Error	Error in writing in EEPROM device while updating configuration log image. Cycle power to the redundancy module. If the error persists, replace the module.
Application Update Required	The module is running boot firmware. Download the application firmware that is obtained from the respective redundancy bundle.
ICPT	A test line on the backplane is asserted. Check if the error message goes away after removing each module, one at a time. If the error persists, cycle power to the chassis, or replace the chassis.
!Cpt	All modules in the chassis do not belong to the same redundancy platform.

Table 72 - 1756-RM Status Indicators

Indicator	Status	Description
COM	Off	One of these conditions exists: - No power is applied to the module. - Apply power to the module. - There is no communication between redundancy modules in the redundant chassis pair. Diagnose the redundancy configuration to determine why no communication is taking place.
	Red < 1 second	The module has been started and has established partner communication. No action is required.
	Steady red	The module has experienced a critical communication failure. Cycle power to clear the fault. If the major fault does not clear, replace the module.
	Flashing green > 250 ms	Communication activity is present. No action is required.

Table 72 - 1756-RM Status Indicators (Continued)

Indicator	Status	Description
OK	Off	No power is applied to the redundancy module. If necessary, apply power.
	Steady red	One of these conditions exists: - The redundancy module is conducting a self-test during power-up. - No action is necessary. - The redundancy module has experienced a major fault. Cycle power to clear the fault. If the major fault does not clear, replace the module.
	Flashing red	One of these conditions exists: - The redundancy module is updating its firmware. - No action is necessary. - The redundancy module has been configured improperly. - Check the module configuration and correct any issues. - The redundancy module has experienced a minor failure. Cycle power to clear the fault. If the major fault does not clear, replace the module.
	Steady green	The redundancy module is operating normally. No action is required.
	Flashing green	The redundancy module is operating normally but is not communicating with the other redundancy module. If necessary, establish communication with the other redundancy module.
PRI	Steady green	Indicates that the module is functioning as the primary module.
	Off	Indicates that the module is functioning as the secondary module.

Replace Redundancy Modules with 1756-RM or 1756-RM2 Modules

To replace redundancy modules with 1756-RM or 1756-RM2 modules, follow these steps.

1. Access the RMCT for the redundancy module in the primary chassis.
2. On the Configuration tab, set the following redundancy module options:
 - Set Auto-synchronization to Never.
 - Disable fiber security, if applicable

Module Info | Configuration | Synchronization | Synchronization Status | System Update | Event Log

Redundancy Module Options

Auto-Synchronization: Never CIP Serial Number:

Chassis ID: Chassis A Name:

Description:

☒ Enable User Program Control Location:

☐ Enable Fiber Security

3. On the Synchronization tab, select Disqualify Secondary.

Module Info | Configuration | Synchronization | Synchronization Status | System Update | Event Log

Redundancy Commands

Synchronize Secondary Disqualify Secondary Initiate Switchover Become Primary

4. Unplug the fiber cables from both of the redundancy modules.
5. Close any open RMCT sessions that are connected to the redundancy modules.
6. Remove both redundancy modules in any order from the redundant chassis pair.
7. Insert the new primary redundancy module into the same slot in the primary chassis.
8. Wait for the status message 'PRIM' to appear on the front panel of the primary redundancy module.
9. Before inserting the new secondary redundancy module, reconnect the fiber cables between the new redundancy modules.
10. Insert the new secondary redundancy module into the same slot in the secondary chassis.
11. If not already installed, upload the EDS files for the redundancy modules.
For more details, see [EDS Files](#).
12. Update the firmware for the redundancy module in the secondary chassis.

IMPORTANT

To maintain the crossload communication path between redundant modules during the update process, you must update the redundancy module firmware in the secondary chassis before the primary chassis.

13. Update the firmware for the redundancy module in the primary chassis.
14. Access the RMCT for the redundancy module in the primary chassis.
15. On the Configuration tab, set Auto-synchronization and fiber security to the original settings.
16. On the Synchronization tab, select Synchronize Secondary.

Module Info | Configuration | Synchronization | Synchronization Status | System Update | Event Log

Redundancy Commands

Synchronize Secondary Disqualify Secondary Initiate Switchover Become Primary