



ControlLogix® Redundancy System Revision 8

Cat. No. 1756-CNB/D, -CNBR/D, -L55, -L55M13, -L55M14,
-L55M16, -L55M23, -L55M24, 1757-SRM/A, -SRM/B

IMPORTANT

If you have a 1756-L55 controller, you must install a memory board. For more information, see the *ControlLogix Controller and Memory Board Installation Instructions*, publication 1756-IN101.

Introduction

These release notes provide the following information about the components of the redundancy system:

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For more information on the ControlLogix redundancy system, see the *ControlLogix Redundancy System User Manual*, publication 1756-UM523.

When to Use These Release Notes

These release notes correspond to the following components of the ControlLogix redundancy system:

Component:	Catalog number:	Revision:
ControlLogix5555™ controller	1756-L55Mxx	8.90 or later
ControlNet bridge module	1756-CNB/D or -CNBR/D	5.32 or later
redundancy module	1757-SRM/A or -SRM/B	3.13 or later

Compatible Revisions

To use this revision, update your system as follows:

Update this:	To this revision or later:
RSLinx™ software	2.40.01 build 16
RSLogix 5000™ software	8.52
RSNetWorx™ for ControlNet software	3.23
RSNetWorx for DeviceNet software	3.21

How to Update Your System

Update your system in the following order:

1. Install the RSLinx software.
2. Install version 3 of the EDS file for the 1757-SRM/A or -SRM/B module. To install the EDS file, from the *Start* menu, choose *Programs* ⇒ *Rockwell Software* ⇒ *RSLinx Tools* ⇒ *EDS Hardware Installation Tool*.

ATTENTION



3. Update the SRM module firmware.

It takes several minutes to update a 1757-SRM/A or -SRM/B module. *Do not* interrupt the process. Make sure you wait until the SRM module displays REV 3.13 on its four-character display. If you interrupt the process, the module may become inoperative.

When you update the module, it performs the following sequence:

- Two downloads (ERAS/PROG on display twice)
- Reset to rev. 2.20 (FLSH UPDT REQD)
- Two more downloads (ERAS/PROG on display twice)
- Second reset before the update is complete

If the OK LED on the SRM module is red flashing and the 4-character display is blank, then the firmware update has failed. *Do not* cycle the power to the module. Leave the power on and update the firmware of the module again.

4. Update the CNB module firmware.
5. Update the controller firmware.

SRM Configuration Software Enhancements

Revision 2.04 of the SRM Configuration software (now part of RSLinx software, revision 2.40.01 build 16 or later) provides the following enhancements:

Export Events The SRM Event log lets you export selected events. Export the events to either a text file or a CSV (comma-separated value) file.

Auto Update Button The software now includes an *Auto Update* button. When active, the software periodically polls for new events.

Assign a Name, Description, and Identifier This revision lets you assign a name, description, and location identifier to each SRM module. This helps you identify the module in a system with multiple pairs of redundant chassis.

Progress Dialog Box When exporting events from the Event log, the software displays a progress dialog box. Because you have to wait while the software exports events (especially if the software has to first get the events), the dialog shows that the export operation is in progress.

SRM Configuration Software Changes

Revision 2.04 of the SRM Configuration software (now part of RSLinx software, revision 2.40.01 build 16 or later) has the following changes:

Removal of the Get Next 10 Button The *Get Next 10* button is no longer available to retrieve additional events from the SRM Event log. To get and view additional events, simply scroll down through the list of events. The software automatically retrieves the events.

Rename of the RSLinx Context Menu To start the configuration software from RSLinx software, right-click the SRM module and choose *Module Configuration*.

Timestamp Displays Milliseconds The timestamp for events now includes milliseconds.

SRM Configuration Software Corrected Anomalies

Revision 2.04 of the SRM Configuration software (now part of RSLinx software, revision 2.40.01 build 16 or later) corrects the following anomalies:

Incorrect Descriptions The descriptive message associated with error codes for the CNB module or controller have been corrected.

RSLinx Corrected Anomalies

RSLinx software revision 2.40.01 build 16 corrects the following anomalies:

- occasional connection disconnected and then optimized packets re-initialized
- inactive items on Alias topics were being put on scan active when swap occurred

In addition, this revision adds more diagnostics for re-initialization to determine the state of the packet at the point of re-initialization.

This revision corrects additional anomalies that are not listed in this release note. For more information, see the RSLinx release notes.

1757-SRM/A and -SRM/B Module Enhancements

Revision 3.13 of the 1757-SRM/A and -SRM/B modules provides the following enhancements:

Assign a Name, Description, and Identifier This revision lets you assign a name, description, and location identifier to each SRM module. This helps you identify the module in a system with multiple pairs of redundant chassis.

Improved Scan Time This revision decreases the wait time to flush the crossload overflow buffers of the SRM module. The wait time is decreased by 50%. This slightly improves scan time performance and reduces scan time bumps.

1757-SRM/A and -SRM/B Module Corrected Anomalies

Revision 3.13 of 1757-SRM/A and -SRM/B modules corrects the following anomalies:

Synchronization Aborted Under High Traffic Conditions Under high connection traffic conditions, synchronization was aborting when an SRM module entered the synchronization process later than expected. This revision corrects the situation by providing synchronization dwell timing following power-up, switchover, or synchronization abort.

Failure to Synchronize When Commanded When a SRM module was either already disqualified or transitioning to synchronized, it would not accept any future commands or requests. This most often manifested as a failure to synchronize that could not be corrected by a commanded synchronization.

Module Would Not Synchronize If RIUP Was too Fast or Slow If a module in the secondary chassis was removed and inserted while power was on (RIUP), it would sometimes fail to synchronize. It failed to synchronize when you removed the module and then re-inserted it within 5 seconds or a minute or more later.

1756-L55Mxx Controller Changes

Revision 8.89 of the ControlLogix5555 controller has the following changes:

Messages Re-Execute More Quickly A Message (MSG) instruction now re-executes more quickly after a switchover.

Communication with a Remote Node Reestablishes More Quickly In some instances the controller now reestablishes communication more quickly with a remote ControlNet node that was turned off or disconnected.

1756-L55Mxx Controller Corrected Anomalies

Revision 8.90

Revision 8.90 of the ControlLogix5555 controller corrects the following anomalies:

PLC-5 Type Read and Write Messages Failing

PLC-5 Type Read and Write messages would often error. You would see the .ER bit in the message data structure often being set and the Message Configuration dialog in RSLogix 5000 software displaying error code 0001 and extended error code 113.

Deleting a Tag Caused the Controller to Fail

If a tag was part of an OPC optimized packet (being polled by an operator interface, for example), and that tag was then deleted, it would cause the secondary controller to fault with both the RS232 and OK LED solid red. Once the secondary controller was faulted, if another tag was deleted which was also part of an OPC optimized packet, then the primary controller would fault since the secondary was no longer available.

I/O Memory Reduced after Many Switchovers

If a message instruction was enabled just as a switchover occurred, the new primary controller would not correctly release the I/O memory used by the message. After many switchovers, this memory usage could accumulate to the point that where new connections would be rejected due to an out of memory condition.

Controller Fault after Switchover with Large Amounts of I/O Disconnected

If a large quantity of I/O which would normally be controlled by the controller was disconnected and a switchover then occurred, the new primary controller could have faulted with both the RS232 and OK LED solid red.

Secondary Failure to Resynchronize after a Switchover

Occasionally the secondary chassis would fail to resynchronize after a switchover.

- In one case, the description column in the event log of the SRM Module Configuration dialog would indicate [27] followed by a string of additional information when this condition occurred.
- In another case, the Synchronization Status tab of the SRM Module Configuration dialog would show the controller stuck at 25% complete.
- In a third case, the secondary controller would fail with the OK LED solid red and the RUN LED solid green.

A power cycle of the secondary chassis was sometimes required to recover from these conditions.

Controller Clock Time Drifts after Many Switchovers

After many switchovers, the controller wall clock time would drift forward in time.

Revision 8.89

Revision 8.89 of the ControlLogix5555 controller corrects the following anomalies:

Out of I/O Memory Error During Download

It was possible to download a program to a controller that looked as though there was enough IO memory but get an “Out of IO Memory” error during the download.

Cached Connection Setting was not Crossloaded to the Secondary Controller

Sometimes the *Cache Connection* check box of a Message instruction would become unchecked after a switchover.

Online Edit of Tags Might Have Caused Communication Failure

If you deleted an unused tag while online, you might have lost communication with the controller. RSLinx showed a Red X over the controller and you were unable to communicate with the controller through either the serial port or another communication module.

The communication failure could have occurred immediately after you deleted the tag or later on in the execution of the project. A power cycle would temporarily clear the problem.

Several Instances of Secondary Disqualifications

Several crossload issues no longer cause the secondary chassis to disqualify. Also, the following instances no longer occur:

- Crossloading a data object sometimes failed causing the secondary chassis to disqualify. In the Event log of the SRM Configuration software, the description column would indicate “[8]” followed by a string of additional information.
- Crossloading connection information sometimes failed causing the secondary chassis to disqualify. In the Event log of the SRM Configuration software, the description column would indicate “[7]” followed by a string of additional information.
- If you changed the properties of a module in the controller organizer while on-line, the secondary controller may have disqualified.

Several Instances that Caused the Secondary Controller to Become Inoperative

This revision corrects several instances that caused a secondary controller to become inoperative (solid red OK LED):

- creating a tag while online
- synchronizing a system that was previously synchronized, usually with a large number of I/O connections
- cycling power to a secondary controller
 - In some instances this occurred on a system that was previously synchronized.
 - In some instances the controller would remain operative but it would no longer process unconnected messages.

1756-CNB/D and -CNBR/D Module Enhancements

Revision 5.31 of the 1756-CNB/D and -CNBR/D modules provides the following enhancements:

Failure to Synchronize When the SRC Cable Was Pulled

If you disconnected a 1757-SRC cable from an SRM module and then reconnected the cable too quickly, the secondary chassis would fail to synchronize.

Module Displays the Number of Unconnected Buffers in Use

The four-character display on the front of the module now shows the number of unconnected buffers in use. The range is 0 to 20. The CNB module uses unconnected buffers to establish communications between devices (e.g., HMI, I/O, messages between controllers).

CNBR Can Use an Existing CNB I/O Configuration

You can replace a 1756-CNB module with a 1756-CNBR module *without* rebuilding the RSLogix 5000 I/O configuration entries for the module and its associated I/O modules. Before you swap a module:

1. In RSLogix 5000 software, open the properties for the CNB module.
2. For the *Electronic Keying* option, choose *Compatible Module*.

Additional Connection Resources for Redundancy Systems

Additional connection resources now handle redundancy communications. This eliminates the need to take three connections from the general connection pool of 64 connections.

In previous revisions, you had to allocate 3 connections for redundancy communicates (2 for the SRM module and 1 for the partner CNB module).

1756-CNB/D and -CNBR/D Module Corrected Anomalies

Revision 5.32 of the 1756-CNB/D and -CNBR/D modules corrects the following anomalies:

CNB Module Faults in a Heavily Loaded Chassis

CNB modules in a chassis loaded with many modules may have faulted with the text `redunob.c` displayed on the 4 character display of the CNB.

CNB Module Taking a Long Time to Re-establish Connections after many Remote Device Disconnections

The CNB module could have taken a very long time to re-establish a connection to a remote device after that device was disconnected and reconnected hundreds of times.

Revision 5.31

Revision 5.31 of the 1756-CNB/D and -CNBR/D modules corrects the following anomalies:

Failure to Verify Node Addresses

The CNB now verifies that the node address in the I/O configuration of the RSLogix 5000 project matches the actual address of the device.

Pulling the Cable From a Secondary CNB Module Caused a Watchdog Timeout

Under very heavy OPC/DDE communications, removing the ControlNet tap from a secondary CNB module for many seconds caused the secondary controller to experience a major fault (watchdog timeout).

Multiple Downloads Broke Consumed Tag Connections

After an initial download to a redundant controller, a subsequent download caused existing connections in remote controllers to fail. The connections to fail were those connections in a remote controller that was consuming a tag in the redundant controller.

Multiple Instances that Cause a Secondary CNB Module to Disqualify or Fail

This revision corrects several instances that caused a secondary CNB module to either disqualify or stop communicating (solid red OK LED).

- In some instances, one of the following messages would scroll across the 4 character display of the CNB module:
 - `cm_utils.c`
 - `smacdrv.c`
- In some instances, the 4 character display of the CNB module would show *no* diagnostic information.
- Some instances occurred after power was cycled to the secondary chassis or a ControlNet tap of the CNB module was disconnected. In these instances, one of the following messages would scroll across the 4 character display of the module:
 - `redfwdopen.c`
 - `exp_handlers` followed by a string of diagnostic information
- Some instances occurred after turning off a remote node or disconnecting a remote node from the ControlNet network. In these instances, one of the following messages would scroll across the 4 character display of the module:
 - `smacisr.c`
 - `timer_task.c`
 - `exp_handlers` followed by a string of diagnostic information

Restrictions

This ControlLogix redundancy system has the following restrictions:

Product Service Advisory ACIG 2004-08-003

With this revision of ControlLogix5555 controllers, the following functional issue exists:

Backplane Errors May Cause Loss of Input Data

Electrical noise induced on the local 1756 backplane may cause input data from an I/O module, communication module, or controller to stop updating. The controller does not detect when this occurs and the connection status and I/O LED indicators will indicate that input data is updating correctly. When this anomaly occurs the input data, for the module(s) affected, is frozen with the last valid update.

This situation requires a significant burst of noise with a duration long enough to exhaust the retries normally being performed by the modules on the backplane.

Temporary Workaround

Cycle power to the controller or download the user program to correct the situation. Reduce electrical noise that can affect the 1756 backplane to avoid this situation.

Problem Correction

To correct this issue, update the ControlLogix redundancy system to revision 11.72 or later.

Removing a Tap or Breaking a Cable Could Stop All Communications over the Network

If the lowest node on a ControlNet network is a 1756-CNB/B or -CNBR/B module, all communications over the network could stop if:

- A tap to the 1756-CNB/B or -CNBR/B module is disconnected or breaks and then is replaced while power is still applied to the 1756-CNB/B or -CNBR/B module

If a tap to a 1756-CNB/B or -CNBR/B module becomes disconnected or broken, take these actions:

1. Turn off the power to the 1756-CNB/B or -CNBR/B module.
2. Replace the tap.

If a communication failure occurs because of a disconnected or broken tap, cycle power to each primary controller on the network.

To prevent this situation, use a 1756-CNB/D or -CNBR/D module as your lowest node on the network.

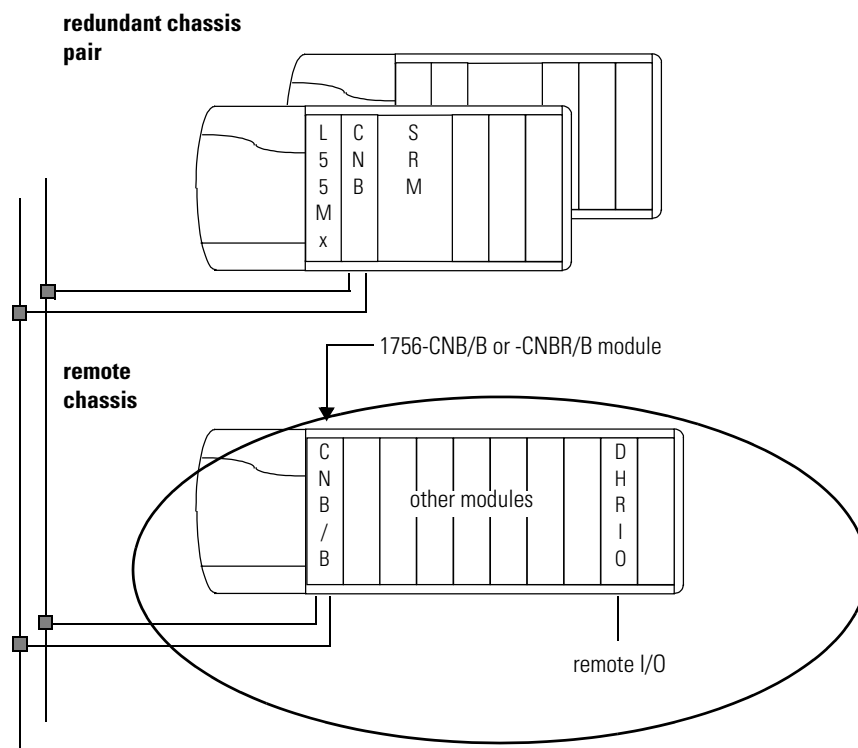
ASCII Instructions May Prevent the Secondary Controller From Synchronizing

After you download a project that contains ASCII instructions (e.g., ABL, ACB) to a pair of redundant controllers, the secondary controller may disqualify and fail to synchronize. If this occurs, turn off both controllers (primary and secondary) and then turn the controllers back on.

Communication Loss When Bridging Through a 1756-CNB/B or -CNBR/B Module

The following combination of modules in a remote chassis could cause a temporarily communication loss with the chassis:

- 1756-CNB/B or -CNBR/B module
- 1756-DHRIO module that is connected to a remote I/O network.



On the first switchover after you download a project to the controller, you may temporarily lose communications with these devices.

The loss of communication occurs on the first switchover after you download the project to the redundant controller.

- You lose communication with the remote chassis and any devices to which you were bridging via the chassis, such as the remote I/O modules.
- During the communication loss, the I/O modules go to their configured state for a communication fault.
- The communication loss is temporary. Communications restore themselves.

To prevent this situation, use 1756-CNB/D or -CNBR/D modules.

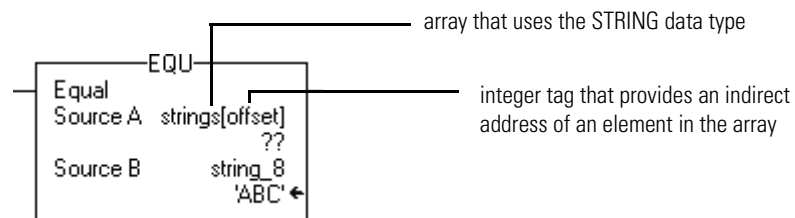
Motion Control You *cannot* use the ControlLogix redundancy system in applications that require motion control. (I.e., You *cannot* use a 1756-M02AE, -M08SE, or -M16SE module.)

Nonvolatile Memory You *cannot* store or load a project to the nonvolatile memory of a 1756-L55M23 or -L55M24 controller.

Indirect Addressing of an ASCII String You *cannot* download a project that uses an indirect address (tag in the subscript of an array) to a string data type, as follows:

For these instructions:	Avoid indirect addresses to these data types:
ARD, ARL, AWA, AWT	any user-defined string data type (The default STRING data type is OK.)
EQU, NEQ, LES, LEQ, GRT, GEQ	all string data types (including the default STRING data type)

For example, the following combinations of tags and instruction would prevent a project from downloading:



1756-L55M16 Controllers Have a 3.5M Byte Limit of Tags You *cannot* download a project that has more than 3.5M bytes of data to a 1756-L55M16 controller. (For redundancy operations, the controller requires enough memory for 2 copies of all data.) During the download, RSLogix 5000 software indicates that the controller is out of memory.

To stay within the 3.5M byte limit, take this precaution:

- As you create tags, periodically download the project. If the project successfully downloads, then you know you are within the 3.5M byte limit.

1756-L55M16 Controllers: Guidelines for the Size of Routines You *cannot* download a project that has very large routines. During the download, RSLogix 5000 software indicates that the controller is out of memory. (While online, you may be able to create a very large routine, but once offline you will be unable to download the project.)

To avoid creating routines that are too large, take these precautions:

- Limit the number of rungs in a routine to less than 2500. (Use a series of smaller routines.)
- If you are entering a large number of rungs in a routine, do this offline.
- As you enter rungs, periodically download the project. If the project successfully downloads, then your routines are within limits.

1756-L55M12 and -L55M22 Controllers Not Currently Supported You *cannot* use either a 1756-L55M12 or -L55M22 controller in a redundant system. A future revision will support those controllers.

Communication with a Device Over RIO Sometimes Fails If your system communicates with I/O over a universal remote I/O network, the following could occur:

- If power is cycled to the remote device, the controller may not reestablish communication with the device. In the *Properties* dialog box of the remote I/O adapter for the device, the *Status* line displays “Shutting Down.”

If this occurs, either:

- Use the SRM Configuration software to disqualify and then synchronize the secondary chassis.
- Cycle the power to the secondary chassis.

Simultaneous Power Up Could Cause the Secondary Chassis to Fail to Synchronize If you turn on the power to both redundant chassis at the same time, the secondary chassis may *not* synchronize.

- If this occurs, cycle the power to the secondary chassis.
- To prevent this, design your system so you can power up each redundant chassis independent of the other redundant chassis.

CNB Module May Display *PwNS* In very rare instances, a power cycle to the secondary chassis may cause the CNB module or modules in that chassis to display *PwNS* on their 4 character display.

If this occurs, use the SRM Configuration software to synchronize the secondary chassis. You may have to do this 2 times. If the secondary chassis fails to synchronize, cycle power to the secondary chassis.

Absence of I/O May Prevent Synchronization The following *combination* of events may prevent the secondary controller from synchronizing (both events must occur together):

- The primary controller cannot communicate with multiple devices in its I/O configuration. This occurs if multiple nodes are turned off or disconnected from the ControlNet network.
- The secondary controller becomes disqualified for any reason.

If this occurs, the Event log of the SRM Configuration software indicates the following:

```
L55 partner not present
```

To recover, use the SRM Configuration software to manually synchronize the system.

To prevent this situation, *before* you turn off a node or disconnect it from the network inhibit the connection to the node.

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its products. At <http://support.rockwellautomation.com>, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://support.rockwellautomation.com>.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

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

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

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