

ControlLogix Standard Redundancy Firmware, Revision 16.057_kit1

Redundancy Module Catalog Numbers

1756-RM2, 1756-RM2XT, 1756-RM, 1757-SRM

Controller Catalog Numbers

1756-L61, 1756-L62, 1756-L63, 1756-L64

Communication Module Catalog Numbers

1756-CNB/D, 1756-CNB/E, 1756-CNBR/D, 1756-CNBR/E, 1756-ENBT, 1756-EWEB

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About This Publication

These release notes describe enhancements, corrected anomalies, and known anomalies specific to redundancy system software, **firmware bundle revisions 16.057_kit1, 16.057_Aug2012, 16.057, 16.056, 16.053, and 16.050.**

Information added to these release notes is indicated by change bars like the one shown to the left of this paragraph.

IMPORTANT References to the 1756-RM2 and 1756-RM2XT modules are synonymous with 1756-RM2/A and 1756-RM2XT/A modules in text and graphics throughout this publication.

About This Redundancy Firmware Bundle

This firmware bundle is 16.057_kit1. This redundancy firmware bundle revises the previous bundle, revision 16.057_Aug2012. The 16.057_kit1 firmware bundle contains the firmware components listed in [Table 1](#)

We strongly recommend that you review the information provided regarding previous firmware revisions. We recommend that you do so because if you are upgrading your firmware through multiple previous revisions, all of the information specific to all of the revisions is applicable.

IMPORTANT References to the 1756-RM2/A module also apply to the 1756-RM2XT/A module.

The following features have been added with the revision 16.057_kit1 release:

- Addition of the 1756-RM2/A and 1756-RM2XT/A redundancy modules.
- The 1756-RM2/A module is interference-free with regard to safety functions and can be used in ControlLogix® SIL2 applications.
- Redundant fiber ports for the 1756-RM2/A module for crossloading; no single point of failure of a fiber cable.
- During a switchover of the fiber channels on the 1756-RM2/A module, scan time can encounter a delay of ~10 ms or less; however, the chassis remains synched at all times during the channel switchover process.

IMPORTANT Only the modules specified in the table below can be used in the standard redundancy system and these firmware revisions.
Modules that are not listed in the table are not compatible with the standard redundancy system and are not supported by these redundancy firmware bundle revisions.

Table 1 - Required Series and Firmware Bundle Revisions for Components Used in a Redundancy System, Revisions 16.057_kit1, 16.057_Aug, 16.057, 16.056, 16.053, and 16.050

Cat. No.	Module Description	Series	Firmware Revision
1756-CNB	ControlLogix® ControlNet™ bridge module	D	7.016
1756-CNBR	ControlLogix redundant ControlNet bridge module		
1756-CNB	ControlLogix ControlNet bridge module	E	11.005
1756-CNBR	ControlLogix redundant ControlNet bridge module		
1756-ENBT	ControlLogix EtherNet/IP bridge module	Any	6.006
1756-EWEB	ControlLogix EtherNet/IP web server module	Any	4.016
1756-L61	ControlLogix5561 controller	Any	16.057
1756-L62	ControlLogix5562 controller		
1756-L63	ControlLogix5563 controller		
1756-L64	ControlLogix5564 controller		
1756-RM2	ControlLogix redundancy module	A	20.004
1756-RM2XT	ControlLogix redundancy module		
1756-RM	ControlLogix redundancy module	A, B	2.006
1757-SRM	ControlLogix system redundancy module	A, B	5.004

IMPORTANT The 1756-ENBT build is 6.006 for firmware revision 16.057, but RSLogix™ 5000 software version 16 does not recognize an ENBT major revision greater than 4 in a project. Users upgrading to the 6.006 ENBT build will need to set the Electronic Keying fields of the 1756-ENBT module properties to Compatible Keying; otherwise, an error will occur.

The firmware bundle can be downloaded from <http://rockwellautomation.com/support>. It is identified as V16.057_kit1.

Compatible Software Versions

Use these versions of software with this redundancy firmware bundle.

Table 2 - Required Software Versions for Redundancy System, Firmware Bundle Revisions 16.057_kit1, 16.057_Aug2012, 16.057, 16.056, 16.053, and 16.050

Software	Version
FactoryTalk® Services Platform	2.10.01 (CPR 9, SR1) ⁽¹⁾
FactoryTalk View Site Edition (SE)	5.00.00 (CPR 9)
Redundancy Module Configuration Tool	8.01.05
RSlinx® Enterprise	5.17.00(CPR 9, SR1) ⁽²⁾
RSlinx Classic	2.54.00 ⁽³⁾
RSLogix 5000	16.04.00
ControlFLASH™	9.00.15

Table 2 - Required Software Versions for Redundancy System, Firmware Bundle Revisions 16.057_kit1, 16.057_Aug2012, 16.057, 16.056, 16.053, and 16.050

Software	Version
RSNetWorx™ for ControlNet	9.00.00 (CPR 9, SR1)
RSNetWorx for DeviceNet	9.00.00 (CPR 9, SR1)
RSNetWorx for EtherNet/IP	9.00.00 (CPR 9, SR1)

- (1) Use the most recent FactoryTalk Services Platform Patch Roll-up with this redundancy firmware revision. For the most recent patch roll-up, see Rockwell Automation Knowledgebase Answer ID 56184, accessible at: <http://www.rockwellautomation.com/knowledgebase/>.
- (2) See [FactoryTalk View Software Considerations](#) on page 4 for use considerations.
- (3) If your redundant system is comprised of ControlLogix-XT modules placed in a 1756-A5XT chassis, RSLinx Classic software, version 2.55 or later, is required.

FactoryTalk View Software Considerations

FactoryTalk View software is required for use only with these human-machine-interfaces (HMIs):

- PanelView™ Plus terminal
- VersaView® industrial computer running a Windows CE operating system
- RSView® Supervisory Edition software

IMPORTANT

If you are using FactoryTalk View Site Edition software, install the RSLinx Enterprise HOTFIX. The HOTFIX improves the EtherNet/IP switchover time.

For more information, see Knowledgebase document R154640079. To access the Rockwell Automation Knowledgebase, go to <http://www.rockwellautomation.com/support>.

About the Redundancy Module Configuration Tool

The Redundancy Module Configuration Tool (RMCT) is required for use with both the 1756-RM and 1757-SRM modules. Use the RMCT to do the following:

- Configure redundancy system parameters. For example, to configure the Auto-Synchronization parameter.
- View redundancy system event logs when troubleshooting your system.

RSLinx Classic software includes the RMCT, however, it is not likely to be the version that is compatible with this firmware revision.

This firmware bundle also contains the RMCT. To install the RMCT, open the executable file and complete the steps as directed by the installation wizard.

TIP The RMCT does not appear to be updated to a new revision until the redundancy module firmware has been updated.
This is because the RMCT automatically uses the version that is compatible with the redundancy module firmware revision installed.

For information about checking the version of your RMCT, see [Upgrade the Redundancy Module Configuration Tool \(RMCT\)](#) on page 21.

Before You Begin

Before upgrading a system to standard redundancy firmware bundle revision 16.xxx, consult this table to determine if another firmware upgrade is required.

If currently using firmware bundle revision	Then upgrade to
11.xxx	15.xxx before upgrading to 16.xxx
13.xxx	
15.xxx	16.xxx

Enhancements

These enhancements are provided with enhanced redundancy firmware revision 16.057_kit1.

IMPORTANT All previous 1756-RM, 1756-RMXT and RMCT enhancements are included in the 1756-RM2, 1756-RM2XT modules and RMCT.

System Component	Enhancement
Redundancy Module Configuration Tool (RMCT), 1756-RM2, 1756-RM2XT	Automatic Export The Export All button on the Event Log tab allows all the event log records and internal diagnostic data from both redundancy modules in the chassis pair to be collected automatically.
	Major Fault Recovery The redundancy module can now communicate on the backplane for most of its major fault conditions. When the redundancy module is in Major Fault state but communicating on the backplane, the OK status indicator flashes red and the module display shows the 4-character error code. The Clear Fault button on the Event Log tab automatically becomes active as soon as a major fault occurs on the redundancy module. The Module Info tab shows the fault code and associated information. You can click the Clear Fault button to clear the fault without removing and reinserting the module. Once the fault is cleared, the redundancy module automatically reboots and enters a primary or secondary state.
	Redundant fiber ports for the 1756-RM2/A module for crossloading; no single point of failure of a fiber cable.
	Addition of the 1756-RM2/A and 1756-RM2XT/A redundancy modules.
	The 1756-RM2/A module is interference-free with regard to safety functions and can be used in ControlLogix® SIL2 applications.
	During a switchover of the fiber channels on the 1756-RM2/A module, the chassis remains synched at all times. (Scan time can encounter a delay of ~10 ms or less during this fiber channel switchover.)

Enhancements with Firmware Bundle Revisions 16.057 and 16.057_Aug2012

These enhancements are provided with standard redundancy firmware bundle revisions 16.057 and 16.057_Aug2012.

System Component	Enhancement
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>The false execution time of Add-On Instructions have been improved.</p> <p>With previous revisions, the false execution time of an Add-On Instruction was dependent on the number of parameters (input, output, and inout) configured for the instruction. The more parameters configured, the longer the false execution time of the Add-On Instruction.</p> <p>With this revision, the false execution time of an Add-On Instruction is now constant if a scan false routine is not created. To determine the false execution time of Add-On Instructions based on your controller, reference the values published in the Logix5000 Controllers Execution Time and Memory Use Reference Manual, publication 1756-RM087.</p>

Lgx00106477

Enhancements with Firmware Bundle Revision 16.056

These enhancements are provided with standard redundancy firmware bundle revision 16.056.

Table 3 - Enhancements with Firmware Bundle Revision 16.056

System Component	Enhancement
1756-EWEB	With 1756-EWEB firmware revision 4.010, socket services are available for use with the standard redundancy system. To download revision 4.010, go to http://www.rockwellautomation.com/support and download the revision posted with the 1756-EWEB module.
1756-RM	<p>The 1756-RM module supports the use of standard redundancy-system communication modules.</p> <p>With this firmware revision, the 1756-RM module can be used with standard communication modules in redundant chassis. To see a list of standard communication modules that are compatible with the 1756-RM module, see the modules listed in the About This Redundancy Firmware Bundle section on page 2.</p> <p>Auto-qualification and synchronization processes of the 1756-RM module are stopped after a chassis pair first fails to synchronize.</p> <p>In previous firmware revisions, if the Auto-Qualification parameter is set to Always and the controller in the secondary chassis faulted, or a communication module was removed from the chassis, the 1756-RM module would continuously attempt to qualify the redundant chassis. As a result of the continuous attempts to qualify, the event logs became filled with synchronization failure events, thus making the original fault more difficult to troubleshoot.</p> <p>With this firmware enhancement, the 1756-RM module stops auto-qualification and synchronization attempts after the first fault occurs. This makes troubleshooting the original fault easier.</p>
1756-RM, 1757-SRM	<p>Recent synchronization attempts executed by the primary redundancy module are logged in the Recent Synchronization Attempt log of the secondary redundancy module. The log can viewed by accessing the Synchronization tab within the RMCT.</p> <p>Previously, the Recent Synchronization Attempt log of the secondary 1757-SRM module would not indicate synchronization attempts executed by the primary redundancy module.</p>

Lgx00080574

Lgx00066149, Lgx00083168

Table 3 - Enhancements with Firmware Bundle Revision 16.056

System Component	Enhancement																
1756-RM, 1756-RMXT	<p>Synchronization failure reports enhanced by adding 'Partner Module not Found' cause.</p> <p>In previous revisions, if synchronization failed due to either of the causes described below, then failure was indicated by the same cause statement in the synchronization log of the RMCT. For both types of failures, 'Module Pair Incompatible' was indicated as the cause. Causes include the following:</p> <ul style="list-style-type: none"> • Partner modules at incompatible firmware revisions, or have mismatched configurations • A secondary module is not installed or powered <p>With this firmware revision, the 1756-RM module is able to differentiate between partner incompatibilities and a missing secondary module. The RMCT indicates a missing secondary module by stating 'Partner Module not Found' in the Cause column of the Recent Synchronization Attempts log.</p> <div data-bbox="391 537 922 785" style="border: 1px solid gray; padding: 5px;"> <p>Recent Synchronization Attempts:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Order</th> <th>Result</th> <th>Cause</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>Abort</td> <td>Partner Module not Found</td> </tr> <tr> <td>N-1</td> <td>Success</td> <td>—</td> </tr> <tr> <td>N-2</td> <td>Abort</td> <td>Module Pair Incompatible</td> </tr> <tr> <td>N-3</td> <td>Abort</td> <td>Module Pair Incompatible</td> </tr> </tbody> </table> </div> <p style="margin-left: 400px;">Module is not installed or powered in chassis.</p> <p style="margin-left: 400px;">Modules are at different firmware revisions.</p>	Order	Result	Cause	N	Abort	Partner Module not Found	N-1	Success	—	N-2	Abort	Module Pair Incompatible	N-3	Abort	Module Pair Incompatible	
Order	Result	Cause															
N	Abort	Partner Module not Found															
N-1	Success	—															
N-2	Abort	Module Pair Incompatible															
N-3	Abort	Module Pair Incompatible															
	Lgx00083165																
	<p>The timestamps of Lock for Update and Initiate Locked Switchover commands are more precise.</p> <p>In previous firmware revisions, when the redundant system was locked for an update or a locked switchover was initiated, the 1756-RM module would indicate the same time for both the initiation and completion of those commands.</p> <p>With this revision, the initiation and completion of each of these commands is timestamped accordingly and the difference in time between initiation and completion can be observed.</p> <div data-bbox="358 1012 1458 1283" style="border: 1px solid gray; padding: 5px;"> <p>System Update Lock Attempts</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>System Lock History</th> <th>Initiation Time</th> <th>Status</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>6/3/2009 08:11:18:989</td> <td>In Progress</td> <td>Lock for update initiated at :6/3/2009 08:11:18:989</td> </tr> </tbody> </table> <p style="text-align: center;">↓</p> <p>System Update Lock Attempts</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>System Lock History</th> <th>Initiation Time</th> <th>Status</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>6/3/2009 08:11:18:989</td> <td>Locked</td> <td>System locked at :6/3/2009 08:11:50:680</td> </tr> </tbody> </table> </div>	System Lock History	Initiation Time	Status	Result	N	6/3/2009 08:11:18:989	In Progress	Lock for update initiated at :6/3/2009 08:11:18:989	System Lock History	Initiation Time	Status	Result	N	6/3/2009 08:11:18:989	Locked	System locked at :6/3/2009 08:11:50:680
System Lock History	Initiation Time	Status	Result														
N	6/3/2009 08:11:18:989	In Progress	Lock for update initiated at :6/3/2009 08:11:18:989														
System Lock History	Initiation Time	Status	Result														
N	6/3/2009 08:11:18:989	Locked	System locked at :6/3/2009 08:11:50:680														
	Lgx00083167																

Enhancements with Firmware Bundle Revision 16.050

These enhancements were provided with standard redundancy firmware bundle revision 16.050.

Table 4 - Enhancements with Firmware Bundle Revision 16.050

System Component	Description
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>Firmware revision 16.050 provides redundancy support for controller programming with Add-On Instructions.</p> <p>Synchronization points for programs within the RSLogix 5000 project can be configured. Redundancy firmware revision 16.050 provides the ability to limit which programs are followed by synchronization. In many applications, this can reduce the overall impact to the task scan time by reducing the number of times a data area is synchronized. Removing a synchronization point results in 1 ms of overhead time.</p> <p>However, reducing the number of synchronization points may delay the switchover time because more programs may need to be re-scanned by the new primary controller as it starts at the last synchronization point.</p> <p>Synchronization is performed at the end of the last program in the task's program list, regardless of its Synchronize Data after Execution selection.</p>
1756-L64	Standard redundancy firmware revision 16.050 provides support for the use of 1756-L64 controllers in the redundant system.
Redundancy Module Configuration Tool (RMCT)	<p>System Event History accessible via the Redundancy Module Configuration Tool (RMCT).</p> <p>A system event history tab is available in the RMCT and is visible only when the session is launched against the 1756-RM module. This feature automatically captures key events occurring in the redundant system that tell why a switchover occurred or why redundancy was lost.</p> <p>Certain events also indicate what caused the chassis pair to become synchronized. The 20 most recent entries are available for viewing. Each entry has a user comment attached to it that can be used to enter system maintenance information.</p> <p>For more details, see the online help of the RMCT.</p> <p style="text-align: right;">Lgx00073250</p>
	<p>Event Log provides additional module information.</p> <p>The 1756-RM module is able to report any changes in the application firmware revision and the backplane serial number via entries posted to the Event Log. This information indicates that a firmware upgrade took place and whether the chassis location of the 1756-RM module was changed.</p> <p style="text-align: right;">Lgx00073278</p>
Redundancy Module Configuration Tool (RMCT)	<p>The Synchronization Status tab provides module type and firmware revision data.</p> <p>Within the RMCT, the Synchronization Status tab displays the product name string and firmware revision of redundancy-compliant modules in the chassis.</p> <p style="text-align: right;">Lgx00075919</p>
	<p>User-identity parameter increased to 64 characters.</p> <p>The character length of each of the user identity parameters extends to a maximum of 64 characters.</p> <p style="text-align: right;">Lgx00075917</p>
	<p>The RMCT provides configuration features for both the 1757-SRM and 1756-RM modules.</p> <p>The RMCT version specified in this revision (16.050) is compatible with both the 1757-SRM module and the 1756-RM/A module.</p> <p style="text-align: right;">Lgx00076319 and Lgx00076320</p>
	<p>The RMCT packaged with redundancy firmware revision 16.050 contains two versions of the RMCT for increased compatibility with the 1757-SRM modules. Version 5.1.1 of the RMCT is compatible with the 1757-SRM module firmware packaged with revision 16.050, but is not compatible with later 1757-SRM module firmware revisions. Therefore, RMCT version 5.2.3 shipped in this revision also includes a previously shipped version 3.6.4.</p> <p>The RMCT version that is compatible with this firmware revision installs both RMCT versions on the workstation. When you open the 1756-RM Module Configuration dialog box in RSLinx Classic software, version 3.6.4 of the RMCT launches if the firmware revision of the module is at major revision 5, or earlier. If the major revision of the 1757-SRM module firmware is 5, then version 5.2.3 of the RMCT launches. The restrictions that pertain to the use of RMCT version 3.6.4 remain the same.</p> <p style="text-align: right;">Lgx00080053</p>

Table 4 - Enhancements with Firmware Bundle Revision 16.050

System Component	Description
1757-SRM	<p>WCT Object attribute redefined. The 1757-SRM module's currentTime attribute of the WCT object matches the revision 16 ControlLogix controller specifications. The attribute number has been changed from 1 to 11. The default starting date was changed from January 1, 1972 to January 1, 1970.</p> <p style="text-align: right;">Lgx00075918</p>
	<p>1757-SRM module is able to identify standard and enhanced-redundancy system components. The 1757-SRM module has the ability to synchronize or lock a redundant chassis pair containing only these standard redundancy modules:</p> <ul style="list-style-type: none"> • 1756-CNB/D • 1756-CNB/E • 1756-CNBR/D • 1756-CNBR/E • 1756-ENBT • 1756-EWEB • 1756-L61, 1756-L62, 1756-L63, 1756-L64 <p>If standard communication modules are used with any of these enhanced redundancy communication modules in the redundancy chassis:</p> <ul style="list-style-type: none"> • 1756-CN2/B • 1756-CN2R/B • 1756-EN2T <p>or, with a 1756-CNB/A module, then the 1757-SRM module displays a '!Cpt' message on the status display and aborts any qualification or lock attempts.</p> <p style="text-align: right;">Lgx00075985</p>

Corrected Anomalies

These sections describe anomalies corrected in standard redundancy firmware bundle revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050.

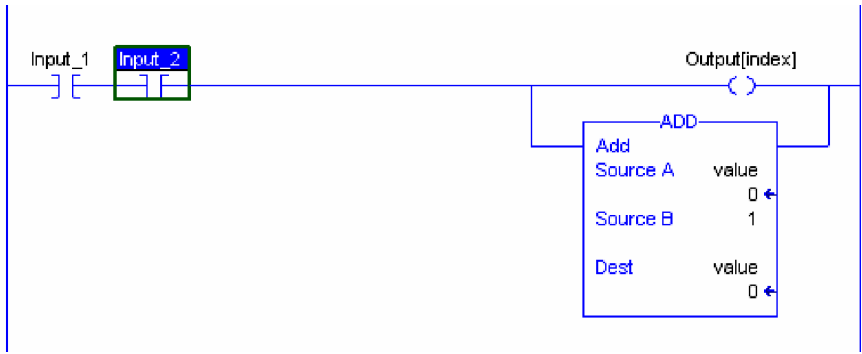
Corrected Anomalies with Firmware Bundle Revision 16.057_Aug2012

These anomalies have been corrected with standard redundancy firmware bundle revision 16.057_Aug2012.

System Component	Description
1757-SRM	<p>CORRECTED: When persistent CRC errors occur on the ControlLogix backplane with a 1757-SRM module, the system cannot perform a successful switchover. This occurs when using standard redundancy systems running the 1756-Lxx Standard Redundancy Bundle revision 16.057 or earlier.</p> <p style="text-align: right;">Lgx00126873</p>
1756-ENBT, 1756-EWEB	<p>CORRECTED: When used in a standard redundancy system with the 1757-SRM or 1756-RM module, E0300 errors on these modules will not cause a switchover. This occurs when using standard redundancy systems running the 1756-Lxx Standard Redundancy Bundle revision 16.057 or earlier.</p> <p style="text-align: right;">Lgx00128342</p>

Corrected Anomalies with Firmware Bundle Revision 16.057

These anomalies have been corrected with standard redundancy firmware bundle revision 16.057.

System Component	Description
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>Fault handlers can be defined at the controller and program scope levels. These fault handlers are typically used to handle major recoverable faults that can occur during runtime execution of an application due to programming errors. A typical example of this would be handling indirect addressing that has gone out of range; MyTag[index], where index is larger than the size of the array.</p> <p>Faults can also be handled by the controller during pre-scan of the controller program on the transition to Run mode. Again, for example, the handling of indirect addressing that has gone out of range.</p> <p>There is an anomaly when these methods attempt to handle a fault.</p> <p>These are the possible ways the anomaly can manifest itself:</p> <ul style="list-style-type: none"> • The controller will experience a major non-recoverable fault. I/O goes to their configured safe state, and the user application is cleared from memory. At this point, a Code 1 Type 60 or 61 major recoverable fault will be logged in the controller. This requires you to redownload the application. • Tag data corruption. • Online saving or uploading failures. • Anomalous program execution. <p>For example, if a rung is being scanned false and there is an instruction that has false execution, the fault handler executes so the remainder of the rung will scan true. In the example below, the OTE instruction has an index out of range. After returning from the fault handler, the ADD instruction will execute, even though the rung input conditions are false.</p>  <p style="text-align: right;">Lgx00106481, Lgx00107423, Lgx00100766, Lgx00106478</p>

Corrected Anomalies with Firmware Bundle Revision 16.056

These anomalies have been corrected with standard redundancy firmware bundle revision 16.056. The descriptions in this table describe the anomalous behavior that you may experience if you do not update to this revision.

Table 5 - Corrected Anomalies in Standard Redundancy Firmware Bundle Revision 16.056

System Component	Anomaly Description
1756-CNB/D, 1756-CNB/E, 1756-CNBR/D, 1756-CNBR/E	Use of connected MSG instructions to read data from the secondary chassis may cause loss of control. If ALL of the following conditions are true, there exists a remote possibility that the redundancy chassis may switch over with a faulted 1756-CNB or 1756-CNBR module in the new primary chassis. <ul style="list-style-type: none"> A controller in a remote chassis uses connected MSG instructions to read data from the secondary through a 1756-CNB or 1756-CNBR module located in the secondary chassis. The same controller is also using one or more 'Uncached Connected' MSG instructions to access data in the primary through a 1756-CNB or 1756-CNBR module that resides in the same chassis slot number used for the secondary messages. The remote chassis is quickly power cycled while it is in RUN mode. <p style="text-align: right;">Lgx00084583, Lgx00084583, Lgx00089533, Lgx00074710, Lgx0007765, Lgx00095691</p>
	When the lowest node of the ControlNet network cannot be detected, the 1756-CNB module may fault and indicate 'ASSERT: redptnrchk.c.' on the module status display. ControlNet network conditions that may cause the fault include: <ul style="list-style-type: none"> missing network terminator. defective cable or tap. use of redundant cabling and with cables broken at different locations on both channels A and B. use of redundant cabling and a network where the number of modules connected to channel A differ from the number of modules connected to channel B by more than two. <p style="text-align: right;">Lgx00069688 and Lgx00069034</p>
	Some network disruptions may cause the secondary 1756-CNB or 1756-CNBR module to constantly be in a DUP NODE state. <p style="text-align: right;">Lgx00079816, Lgx00079862</p>
1756-ENBT	A state change of the 1756-ENBT causes a timeout. Occasionally, during qualification, a 1756-ENBT module state change time-out, a minor fault, will cause qualification to fail. To recover, re-issue the synchronize command. <p style="text-align: right;">Lgx00076373</p>
	Module continuously displays code 'PLU' (Primary Locked for Update). The 1756-ENBT module continues to display 'PLU' after you remove a primary or secondary 1757-SRM cable. <p style="text-align: right;">Lgx00081598</p>
	A fault indicating duplicate IP addresses does not occur on 1756-ENBT modules in redundant systems where these conditions are present: <ul style="list-style-type: none"> IP address swapping is enabled for each of the 1756-ENBT modules. The 1756-ENBT modules with duplicate address are in separate primary chassis. The separate primary chassis were previously operating as a redundant chassis pair. With this firmware revision, the 1756-ENBT modules accurately verify that no duplicate IP addresses are present and accurately report the duplicate IP addresses. <p style="text-align: right;">Lgx00077356</p>
	After a switchover, the new primary 1756-ENBT module may continue to use the IP address of the secondary 1756-ENBT module instead of assuming the primary 1756-ENBT module IP address. With this firmware revision, the new primary 1756-ENBT module successfully assumes the primary IP address after a switchover. <p style="text-align: right;">Lgx00077660</p>

Table 5 - Corrected Anomalies in Standard Redundancy Firmware Bundle Revision 16.056

System Component	Anomaly Description
1756-L61, 1756-L62, 1756-L63, 1756-L64	When an Add-On Instruction is used in the Power-Up Handler or Controller Fault Handler routines, a major nonrecoverable fault (MNRF) occurs on the new primary after two switchovers. Lgx00088390
	When redundant controllers are used to produce data communicated on a ControlNet network, after a switchover, produced data reverts to an earlier value until the next requested-packet interval (RPI) after and output scan occurs. Lgx00090100
	Redundant chassis synchronization fails when ControlLogix controllers are used in a redundant system where the redundant controller is consuming data produced by a GuardLogix controller. Lgx00091317
	After a switchover, an Add-On Instruction stack overflow error occurs on the new primary controller. This anomaly may occur when: <ul style="list-style-type: none"> • Add-On Instructions are used in the continuous task. • the 'During unused System Overhead Time Slice' parameter (specified in the Controller Properties dialog box, Advanced tab) is set to 'Reserve for System Tasks, eg Communications'. Lgx00093699
1756-L61, 1756-L62, 1756-L63, 1756-L64	A block-transfer message error 16#301 occurs for an extended time period after a successful switchover. This anomaly occurs when the 1756-L6x controller is programmed with a block transfer of data to analog I/O via a 1756-DHRIO module. Lgx00092774
	After a redundant system is synchronized, if the secondary controller is removed or is faulted, the primary 1756-RM module faults with an E054 error code. Removing and reinserting the primary 1756-RM re-initiates qualification and resolves the error. Lgx00083316
	When a redundancy system has been operating in a synchronized state for an extended period of time, a backplane communication error may occur and trigger a complex sequence of system behaviors that includes: <ul style="list-style-type: none"> – error code E054 displayed by the 1757-SRM module. – a task Watchdog timeout occurs on the controller program. – a redundant chassis switchover. – ControlNet modules in the new primary chassis faulting and losing communication with I/O. With this redundancy firmware revision, the controller firmware has been revised to eliminate the internal condition that triggers the backplane communication fault. Lgx00093855
1756-RM	After running in the synchronized state for several days, a 1756-RM module of the pair may fault and indicate error code E8A0. The system-response to the fault depends on the location of the 1756-RM module. If the faulted 1756-RM module is in the: <ul style="list-style-type: none"> • primary chassis, a switchover occurs. • secondary chassis, disqualification occurs. To restore redundancy, remove and reinsert the faulted 1756-RM module. Then, synchronize the chassis.
1757-SRM	When a redundancy system has been operating in a synchronized state for an extended period of time, a backplane communication error may occur and trigger a complex sequence of system behaviors that includes: <ul style="list-style-type: none"> – error code E054 displayed by the 1757-SRM module. – a task Watchdog timeout occurs on the controller program. – a redundant chassis switchover. – ControlNet modules in the new primary chassis faulting and losing communication with I/O. In addition to corrections made in the controller firmware, with this redundancy module revision, changes have been made to the system redundancy module firmware as a precaution. If a backplane communication fault were to occur, it is rapidly detected and indicated by error code E2LH displayed on the 1757-SRM module. Lgx00094714

Table 5 - Corrected Anomalies in Standard Redundancy Firmware Bundle Revision 16.056

System Component	Anomaly Description
1757-SRM	<p>The 1757-SRM module may fault during flash upgrade.</p> <p>If the 1757-SRM modules in the redundant chassis pair are flashed simultaneously, then the 1757-SRM module may display E700 OS ERR on the front panel. To recover, cycle power to the module at the end of the flash upgrade process. To avoid this behavior, flash upgrade each 1757-SRM module separately.</p> <p style="text-align: right;">Lgx00081790</p>
	<p>A minor fault does not clear automatically.</p> <p>Occasionally, after the redundant chassis pair disqualifies or a switchover occurs, a minor fault (E2A0 and E2A1) on the 1757-SRM module may not be cleared automatically. The minor fault status may get automatically cleared if a new minor fault is recorded. The minor fault has no adverse effect on the 1757-SRM module's operation.</p> <p style="text-align: right;">Lgx00080908</p>
	<p>The primary 1757-SRM module faults with an E054 error when the secondary controller is removed or faults.</p> <p>When a secondary controller is removed or faults while synchronized, the primary 1757-SRM module may display an E054 error on its front panel. To recover, remove the primary 1757-SRM module from the rack and re-insert it. This will cause all modules in the secondary to disqualify, allowing a re-qualification to proceed.</p> <p style="text-align: right;">Lgx00083316</p>
	<p>The 1757-SRM module faults indicating error codes E88C and E054 after operating in a synchronized state for an extended period of time.</p> <p>In applications where messaging is heavily used and messaging traffic is extensive, the 1757-SRM module may indicate several minor faults with error code E88C and then a major fault with error code E054. The major fault may cause an unsuccessful switchover where modules in the new primary chassis stop communicating. In addition, a task watchdog timeout occurs on the controller that was previously the primary.</p> <p>With this firmware revision, fault code E2LH is used to indicate the major communication fault on the backplane that previously resulted in the E88C and E054 fault codes. The implementation of fault code E2LH results in a fully-successful switchover to the primary chassis in response to the backplane error.</p> <p style="text-align: right;">Lgx00093354</p>
	<p>The 1757-SRM module faults indicating error code E888 immediately following a switchover.</p> <p>In applications where extensive messaging is used, if a break occurs on a communication module in the primary chassis and a switchover results from the cable break, then a rare timing issue results and causes the 1757-SRM module to fault immediately after the switchover. The fault is indicated with fault code E888.</p> <p style="text-align: right;">Lgx00064969</p>
	<p>Qualification is unsuccessful after upgrading multiple modules in the primary chassis at one time.</p> <p>If multiple modules in the primary chassis are flash upgraded at the same time, the 1757-SRM module cannot determine compatibility status of partnered modules once the upgrade is complete. The result is unsuccessful qualification.</p> <p style="text-align: right;">Lgx00075786</p>

Table 5 - Corrected Anomalies in Standard Redundancy Firmware Bundle Revision 16.056

System Component	Anomaly Description
1756-SRM	<p>1757-SRM event log is unavailable after a power cycle.</p> <p>Occasionally, after cycling power to the 1757-SRM module, the event log for the module is inaccessible. In addition, the error code indicated in the Module Info tab of the RMCT indicates an EK2C error.</p> <p style="text-align: right;">Lgx00075786</p>
	<p>The 1757-SRM module's event log contains random entries that state 'This Event Does Not Exist'.</p> <p>In situations where an event log record could not be successfully written to nonvolatile memory, random entries in the event log may state 'This Event Does Not Exist'.</p> <p style="text-align: right;">Lgx00071328</p>
	<p>The secondary 1757-SRM module indicates an E010 error code when online edits are made to the primary controller's program while the system is synchronized.</p> <p>The secondary 1757-SRM module may fault and indicate error code E010 when these system conditions exist:</p> <ul style="list-style-type: none"> • Multiple controller programs with these settings are used: <ul style="list-style-type: none"> – programs do not synchronize or crossload data at their completion. – programs are uninhibited on the primary controller. • Redundant chassis are synchronized. <p style="text-align: right;">Lgx00095885</p>
	<p>Disconnecting and reconnecting the fiber-optic cable that connects the 1757-SRM modules while the redundant system is locked for an update results in unexpected communication module states.</p> <p>After reconnecting the fiber-optic cable, the expected states for the communication modules would be:</p> <ul style="list-style-type: none"> • Primary communication module state = PwDS. • Secondary communication module state = DSwP. <p>However, with this anomaly, the modules in the redundant chassis are in these states:</p> <ul style="list-style-type: none"> • Primary communication module state = PwNS. • Primary controller and redundancy module states = PwDS. • Secondary communication module state = DSNP or DSwP. • Secondary controller and redundancy module states = DSwP. <p>This anomaly is corrected with revision 16.056.</p> <p style="text-align: right;">Lgx00089924, Lgx00090421, Lgx00090422</p>

Corrected Anomalies with Firmware Bundle Revision 16.053

These redundancy system anomalies were corrected in redundancy firmware bundle revision 16.053.

Table 6 - Corrected Anomalies with Standard Redundancy Firmware Bundle Revision 16.053

System Component	Description
1756-ENBT	<p>Secondary 1756-ENBT module sometimes stops communicating after a power cycle.</p> <p>A 1756-ENBT module in a secondary chassis sometimes stops communicating after you cycle power to it. To recover, cycle power to the secondary chassis or remove and re-insert the module.</p> <p style="text-align: right;">Lgx00062494</p>
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>Connected messaging to a redundancy controller can cause the controller to have a major nonrecoverable fault (MNRF) or cause disqualification.</p> <p>Performing large Data Table Writes (> 125 DINTs) using connecting messaging to a redundancy controller from certain sources can cause the controller to have a Major Non-Recoverable Fault or cause disqualification. If the latter occurs, the system may not be able to re-synchronize without first cycling power to the primary controller.</p> <p>For the anomaly to occur, the system must be synchronized and the source of the message must be either another controller in the same redundancy chassis or an external controller communicating through 1756-EN2T modules.</p> <p style="text-align: right;">Lgx00084316</p>
	<p>Connected message writes, greater than 107 DINTs, to a synchronized controller pair may fail improperly.</p> <p>While the redundant chassis pair is synchronized and when an external controller is writing to a tag with a message size that is greater than 107 DINTs, the message fails with an invalid error code: 16#83. The first 115 DINTs will be transferred regardless of the error.</p> <p style="text-align: right;">Lgx00084200</p>

Corrected Anomalies with Firmware Bundle Revision 16.050

These redundancy system anomalies were corrected in redundancy firmware bundle revision 16.050.

Table 7 - Corrected Anomalies with Standard Redundancy Firmware Bundle Revision 16.050

System Component	Description
1756-CNB/D, 1756-CNB/E, 1756-CNBR/D, 1756-CNBR/E	<p>Loss of resources in new primary 1756-CNB module after a switchover event.</p> <p>One of these conditions may occur on the new primary if a switchover happens just as a new incoming connection is being processed:</p> <ul style="list-style-type: none"> The module may fault with 'ASSERT: cm_utils.c' on the display. New connection requests may fail with an error code 16#100 'Connection in Use'. CPU utilization on the new primary may be higher than the old primary. The 1756-CNB module may stop communicating, eventually scrolling Us20 on the display. The number of available connections may be less on the new primary. The 1756-CNB module may indicate that a connection is active. The status indicator will be OK solid green, when no connection exists. <p style="text-align: right;">Lgx00074692, Lgx00076563, Lgx00081224, Lgx00081309, Lgx00076633, Lgx00071999</p>
	<p>A 1756-CNB module double-cable break to the synchronized secondary causes permanent disqualification.</p> <p>In some cases, the redundant chassis pair may not automatically requalify if the ControlNet cables for more than one 1756-CNB module in the secondary chassis have been removed and then reattached.</p> <p style="text-align: right;">Lgx00076560 and Lgx00076547</p>
	<p>Fault after switchover caused by a message timeout.</p> <p>Rarely, the 1756-CNB module may fault with 'ASSERT: icn_ucmm.c' on the module status display if an unconnected message times out just before a switchover.</p> <p style="text-align: right;">Lgx00068054, Lgx00076949</p>
	<p>Cycling power to the primary chassis may cause the new primary 1756-CNB module to fault.</p> <p>In some cases, the 1756-CNB module may fault with 'ASSERT: qualtask.c' on the display after a switchover that had been triggered by the loss of communication to the primary chassis.</p> <p style="text-align: right;">Lgx00077417, Lgx00078071</p>
	<p>Connections to secondary controller fail with Out of Connections error.</p> <p>Uncached connected MSG instructions may fail with error code 16#11A 'Out of Connections' when sent through a 1756-CNB or 1756-CNBR module in a secondary chassis.</p> <p style="text-align: right;">Lgx00076370 and Lgx00076564</p>
1756-CNB/D, 1756-CNB/E, 1756-CNBR/D, 1756-CNBR/E	<p>The status indicator flashes a red OK without displaying an error message.</p> <p>After recovering from a power cycle the OK status indicator may continue to flash RED until the first connection has been establish.</p> <p style="text-align: right;">Lgx00081279 and Lgx00076105</p>
	<p>Fault due to connection timeout.</p> <p>If a newly created connection times out before it can be duplicated in the secondary chassis the primary 1756-CNB module may fault with 'ASSERT: redfwdopen.c' on the display.</p> <p style="text-align: right;">Lgx00078094 and Lgx00078314</p>
	<p>Conducting a firmware upgrade using ControlFlash tactility results in a ControlNet module fault.</p> <p>Rarely, the 1756-CNB module may fault with 'ASSERT: icpserv.c' on the display during a ControlFlash update if it has any active connections.</p> <p style="text-align: right;">Lgx00080851</p>
1756-ENBT	<p>System restoration after a double cable break on two 1756-ENBT modules did not automatically synchronize the redundant system.</p> <p>If the two RJ45 cables were connected in quick succession on two 1756-ENBT modules in the same chassis, or a common switch was power-cycled while the chassis pair was synchronized, the system would not re-synchronize automatically, even if the Auto-Qualification option was 'Always' or 'Conditional'.</p> <p style="text-align: right;">Lgx00076205 and Lgx00076116</p>
1756-L6x	<p>Deleting a task or uncheduling a program while online causes a disqualification.</p> <p>The secondary chassis may disqualify and then synchronize if you:</p> <ul style="list-style-type: none"> delete a task while online with the controller. unschedule a program while online with the controller.
Redundancy Module Configuration Tool (RMCT)	<p>The event log of the 1757-SRM module is not accessible.</p> <p>Occasionally, the 1757-SRM Configuration Tool would not display any event records or the 1757-SRM module would fault with EK2C during runtime. The 1757-SRM module now handles this condition by displaying an EB17 minor fault on the Module Info tab in the configuration tool and disables event logging. The module will continue to operate normally. It must be replaced to provide the event logging feature.</p> <p style="text-align: right;">Lgx00080813</p>

Table 7 - Corrected Anomalies with Standard Redundancy Firmware Bundle Revision 16.050

System Component	Description
Redundancy Module Configuration Tool (RMCT)	A new attempt to lock the chassis for firmware upgrade failed due to a previously aborted attempt. An attempt to lock a redundant chassis may not succeed due to configuration issues. In some of these cases, a new attempt to lock was also unsuccessful due to a module insertion or module removal event. Lgx00076690 and Lgx00075397
	A spurious 'System Update Abort' entry is logged at powerup. An unexpected 'System Update Abort' entry was posted to the event log at powerup even when no lock attempt was made. Lgx00076244
	A locked switchover in redundancy causes message block transfers to fail. When performing block transfer messages through a 1756-DHRIO module, it is possible for the messages to fail with a configuration error after performing a locked switchover. Lgx00080298

Known Anomalies

This table in this section lists known anomalies for standard redundancy firmware bundle revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050.

Table 8 - Known Anomalies with Firmware Bundle Revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050

System Component	Description
1756-EWEB	1756-EWEB module may not be at the correct time zone after upgrading the firmware. If you back up your 1756-EWEB settings, and reload them after upgrading your 1756-EWEB module firmware, the 1756-EWEB module may not load the same time zone as that specified when the backup was made. After upgrading your 1756-EWEB module firmware and reloading you settings, access the time zone setting and change it if needed. Lgx00090505
1756-L61, 1756-L62, 1756-L63, 1756-L64	Redundant chassis synchronization fails when a high number of controller connections are used. Chassis synchronization may fail if the controller is near its connection limits. To reduce the likelihood of this anomaly, verify that you use controller connections within the limits of the controller and that at least eight controller connections are reserved for the redundant system. Try to limit the number of controllers connections used to 243 connections, or less. Lgx00063311
	Message timeout errors increase in frequency when the 1757-SRM modules are replaced with 1756-RM modules. When a standard redundancy system is upgraded by replacing 1757-SRM modules with 1756-RM modules, increased message timeout errors may result from messages being sent to the secondary controller. To avoid experiencing the message timeout errors, verify that the messages in your program are not being sent to the secondary controller. Lgx00094298
1756-RM	On very rare occasions, the 1756-RM module may not detect a module in the chassis when you apply power. An undetected module placed in the secondary chassis may cause qualification to be aborted. The undetected module may be identified by viewing the Synchronization Status tab of the RMCT. Lgx00079417
	Repeated connection and disconnection of the 1756-RM fiber optic cable results in various fault codes indicated on the module status display. If the 1756-RM fiber-optic cable is disconnected and connected repeatedly within short periods of time, the redundancy module faults and indicates error codes such as: E0XX or EAXX. To avoid experiencing these faults, wait 5 . . . 10 seconds between disconnecting and connecting the 1756-RM modules' fiber-optic cable. Lgx000845595, Lgx00091960
1756-RM	Disqualification occurs without any external faults. The redundant chassis may disqualify after being synchronized for several days. Usually, extensive I/O connection traffic is also a factor. The cause of the disqualification is a communication anomaly between the controller and 1756-RM module that is indicated by code E88m minor faults. The faults are logged in the event log in addition to other event entries that are specific to the disqualification. To configure your system to automatically recover and re-synchronize, select Always for the Auto-Qualification parameter available in the RMCT. Lgx00099275
1757-SRM	A secondary 1757-SRM module rejects a command issued by using the RMCT. Sometimes the secondary 1757-SRM module rejects a synchronization, disqualification, or switchover command from the RMCT. To avoid this, give the command to the primary 1757-SRM module. Lgx00058897

Restrictions

The restrictions listed in this table are applicable to standard redundancy firmware bundle revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050.

Table 9 - Restrictions with Standard Redundancy Firmware Bundle Revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050

System Component	Description
1756-EWEB	<p>Internet Explorer is not for use as an FTP client with 1756-EWEB modules. Due to errors that occur with security and access to the 1756-EWEB module, do not use Internet Explorer as an FTP client with 1756-EWEB modules. Lgx00091257</p> <p>With firmware revisions 16.050 and 16.053, socket services with the 1756-EWEB module are not available for use. With firmware revision 16.056, socket services with the 1756-EWEB module are available when 1756-EWEB firmware revision 4.010 is used. With firmware revision 16.056, if 1756-EWEB firmware revision 4.009 or earlier is used, socket services are not available. See the section About This Redundancy Firmware Bundle on page 2 for more information about 1756-EWEB firmware revisions that are compatible with redundancy firmware revision 16.056.</p>
1756-L55Mxx	<p>As of redundancy firmware revision 16.050, the ControlLogix5555 controller is no longer supported. Therefore, you cannot use a 1756-L55Mxx controller with redundancy firmware revisions 16.050, or later.</p>
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>If you have a controller at this firmware revision, then you need to update the controller firmware with the controller placed in a nonredundant chassis:</p> <ul style="list-style-type: none"> • 1756-L64 controller at firmware revision 1.10 (boot firmware). • 1756-L61, 1756-L62, 1756-L63 at firmware revision 1.7 (boot firmware). <p>If you install the controller in a redundant chassis, a major nonrecoverable fault (MNRF) may occur, or it may remain in a faulted state. The controller indicates this fault by the OK status indicator being solid red.</p> <p>The label on the side of the controller indicates the series controller and the boot firmware revision as shown in the example here.</p> <div style="text-align: center;"> </div> <p>Complete these steps to upgrade from the boot firmware revision.</p> <ol style="list-style-type: none"> 1. Put the controller in a nonredundant chassis. 2. Update the controller. 3. Put the controller in the redundant chassis. <p>After you have updated the controller from the boot firmware revision, any further updates can be made while the controller is in the redundant chassis.</p> <p>Exception If your controller is already running in a redundant system and you want to update it to a later revision, you may leave it in the existing redundancy system during the firmware update.</p>

Table 9 - Restrictions with Standard Redundancy Firmware Bundle Revisions 16.057_Aug2012, 16.057, 16.056, 16.053 and 16.050

System Component	Description
1756-L61, 1756-L62, 1756-L63, 1756-L64	<p>The equipment phase feature provided with RSLogix 5000 software, version 16, is not supported by standard redundancy firmware revisions, that is, redundancy firmware revisions 16.050, 16.053, and 16.056.</p> <p>If you are using firmware revision 16.056, attempts to download a project that uses equipment phases are successful, however, the redundant chassis cannot qualify. If you are using firmware revision 16.053 or 16.050, downloading a project that contains equipment phases to a redundant controller is unsuccessful.</p> <p>If you want to use the equipment phase feature or RSLogix 5000 software, version 16, with your redundant system, upgrade to an enhanced redundancy system and use enhanced redundancy firmware revision 16.80, or later.</p> <hr/> <p>Alarm instructions provided with FactoryTalk Alarms and RSLogix 5000 software, version 16, are not supported in standard redundancy firmware revisions, that is, redundancy firmware revisions 16.050, 16.053, and 16.056.</p> <p>If you are using firmware revision 16.056, attempts to download a project that uses alarm instructions are successful, however, the redundant chassis cannot qualify. If you are using firmware revision 16.053 or 16.050, downloading a project that contains alarms to a redundant controller is unsuccessful.</p> <p>If you want to use the alarm instructions provided with FactoryTalk Alarms and RSLogix 5000 software, version 16, with your redundant system, upgrade to an enhanced redundancy system and use enhanced redundancy firmware revision 16.80, or later.</p> <hr/> <p>Inhibiting or removing an inhibition from a redundant controller program can cause the secondary chassis to disqualify, then to qualify again.</p> <p>When changing the Inhibit Program setting, plan for secondary chassis disqualification according to potential implications that are specific to your application. Or, unschedule the program rather than inhibiting it.</p> <p style="text-align: right;">Lgx00090432</p> <hr/> <p>Do not use Match Project to Controller property with redundant controllers.</p> <p>If you use the Match Project to Controller property available in the Advanced tab of the Controller Properties dialog box, you cannot go online with, download to, or upload from the new primary controller after a switchover. This is because the serial number of the new primary controller is not the same as the serial number of the old primary controller and the project cannot be matched to the newly-switched-to controller.</p> <p style="text-align: right;">Lgx00063573</p> <hr/> <p>Deleting I/O modules from a project while online with the controller may cause a major nonrecoverable fault (MNRf) on the secondary controller.</p> <p>If your application requires that you delete I/O modules from the project while online with the controller, disqualify the secondary chassis before deleting the I/O modules.</p> <p style="text-align: right;">Lgx00095282</p>
Redundancy Module Configuration Tool (RMCT)	<p>Using version 2.6, or later, of the RMCT with redundancy system firmware revision 11, or earlier, can cause the 1757-SRM module to fault.</p> <p>The 1757-SRM module fault occurs when viewing the Event Log in the RMCT at version 2.6, or later, when the redundant chassis firmware is at version 11 or earlier.</p> <p>Use only RMCT version 2.6, or later, with redundancy firmware revision, 13, or later. RSLinx Classic software, version 2.43 or later, automatically installs version 2.6 or later of the RMCT. For other versions of the RMCT, see Knowledgebase Answer ID 29511 (available at: http://www.rockwellautomation.com/knowledgebase/).</p> <p>If you need to connect to a redundant system at revision 11, or earlier, use version 2.5 of the RMCT.</p>
1757-SRM	<p>Upgrading from redundancy firmware revisions 11 and 13 directly to revision 16.050, 16.053, or 16.056, or later, is not possible.</p> <p>To upgrade the 1757-SRM module to redundancy firmware revision 16.050, 16.053, or 16.056, you first need to upgrade to a revision 15.60-compatible firmware. Then upgrade to firmware revision 16.050, or later, compatible firmware. See Before You Begin on page 5 for more information.</p> <p style="text-align: right;">Lgx00083076</p> <hr/> <p>IMPORTANT: Flashing a 1757-SRM module from revision 2.xx, or earlier, directly to revision 4.3, or later, causes the 1757-SRM module to become permanently inoperable.</p> <p>To avoid inoperability, first flash the 1757-SRM module to any 3.xx revision that is included in the redundancy firmware revisions 13.xx. Once the 1757-SRM module is at revision 3.xx, you can successfully flash to version 4.xx.</p> <hr/> <p>After disconnecting a fiber-optic cable between the 1757-SRM modules, check the synchronization status of the secondary 1757-SRM module before you reconnect the cable. Wait until the module's status is secondary with no partner before reconnecting the cable. Otherwise, the secondary 1757-SRM module could fault with an EA91 error.</p> <hr/> <p>When upgrading 1757-SRM module firmware, allow for several minutes of update time. It takes several minutes to update a 1757-SRM module and the module resets itself at least four times after the upgrade is initiated in ControlFlash software.</p> <p>Interrupting the firmware upgrade of a 1757-SRM module at firmware revision 3.37, or earlier, may cause the module to become inoperable.</p> <p>If the upgrade fails, leave the power on and try again. A failed upgrade is indicated by:</p> <ul style="list-style-type: none"> • Update Status dialog box in ControlFlash software contains a red box and says 'update failed'. • OK status indicator on the 1757-SRM module is flashing and the four-character module status display is blank.

Application Notes

Consider these application notes when configuring, programming, and using your redundant system.

EtherNet/IP Networks and Redundant Systems

IMPORTANT	<p>In a redundant system, use an EtherNet/IP network only for HMI/workstation communication and messaging.</p> <p>Do not use an EtherNet/IP network for:</p> <ul style="list-style-type: none"> • Communication with I/O modules • Communication between devices via produced/consumed tags
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Minimum Value for the Watchdog Time

Use this table to determine which equation to use to calculate the watchdog time for each task in your program.

If	Then use this equation
Switchover time is critical to system performance	$(2 * \text{maximum_scan_time}) + 150 \text{ ms}$
Module firmware will be updated in the field	$(\text{maximum_scan_time}) + 245 \text{ ms}$
You need to safeguard against the removal of a intermodule fiber-optic cable	$(\text{maximum_scan_time}) + 390 \text{ ms}$
You need to safeguard against communication faults in synchronized chassis	$(\text{maximum_scan_time}) + 225 \text{ ms}$

The *maximum_scan_time* is the maximum scan time for the entire task when the secondary controller is synchronized.

Synchronizing After Disqualification

If your secondary chassis becomes disqualified, or you manually disqualify it, take these actions before you try to synchronize the chassis:

- Verify that the synchronization status of the primary module is full compatibility.
- Wait at least 15 seconds after the redundant chassis are disqualified before you try to synchronize them.

Upgrade from Revision 15.xxx, or Later

Complete the tasks listed in this table to upgrade your redundancy system from standard redundancy firmware bundle revision 15.xxx to revision 16.056, or later, while your process continues to run.

Task	Page
Before You Begin	20
Upgrade Workstation Software	21
Upgrade the Redundancy Module Configuration Tool (RMCT)	21
Download and Install Redundancy Firmware Bundle	23
Update EDS Files	23
Prepare the Redundant Chassis for the Firmware Upgrade	23
Update Primary 1756-RM or 1757-SRM Module Firmware	25
Update the Secondary Chassis Firmware	26
Prepare the RSLogix 5000 Project for the Upgrade	28
Update the Secondary Chassis Firmware	26
Lock and Switchover the System for Update	30
Update the New Secondary Chassis Firmware	32
Synchronize the Redundant Chassis	33

Before You Begin

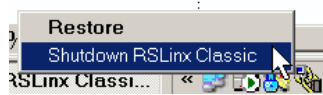
IMPORTANT

- You cannot upgrade to redundancy firmware revision 16.050, or later, if your current redundancy system is at revisions 11...13. For more information, see the [Before You Begin](#) section on [page 5](#).
- During the upgrade procedures, you will not be able to use RSLogix 5000 software to change the mode of the controller. Instead, use the keyswitch on the front of the controller.
- Leave RSNetWorx for ControlNet software closed or offline throughout this procedure. Otherwise, you will see errors in the RSNetWorx software during the update process.
- While completing these tasks to upgrade your redundancy firmware:
 - do not make any changes to the RSLogix 5000 project other than those identified in these tasks.
 - verify that no one will be, or is making, changes to the project.

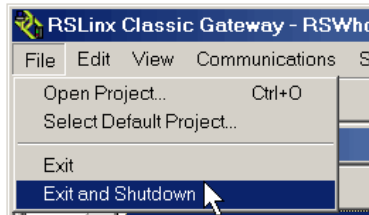
Upgrade Workstation Software

Before you download and upgrade software for use with your redundant system, use one of these methods to fully shut down RSLinx Classic software:

- Right-click the RSLinx Classic icon in the notification area of the screen and choose Shutdown RSLinx Classic.



- With RSLinx Classic software open, from the File menu choose Exit and Shutdown.



Obtain and install the software required for your redundant system configuration and application. See [Compatible Software Versions](#) on [page 3](#) for versions required for use with this redundancy firmware revision.

Use the installation instructions or release notes provided with each software version for installation procedures and requirements.

Upgrade the Redundancy Module Configuration Tool (RMCT)

This firmware bundle also contains the RMCT. To install the RMCT, open the executable file and complete the steps as directed by the installation wizard.

Verify Your RMCT Version

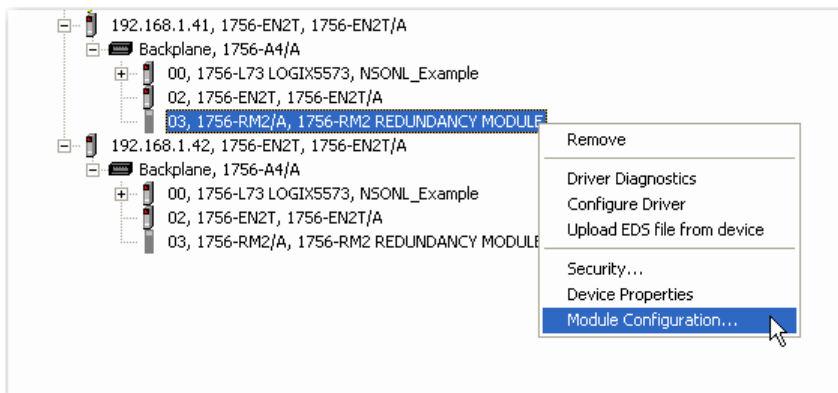
Complete these steps to check or verify the version of the RMCT you have installed.

- TIP** The RMCT launches at the version that is compatible with the 1756-RM module firmware that is currently installed.
If you have not upgraded your 1756-RM module firmware after upgrading your RMCT version, the RMCT version that is indicated may not reflect the version you upgraded to.

1. Launch RSLinx Classic software.
2. Click RSWho.

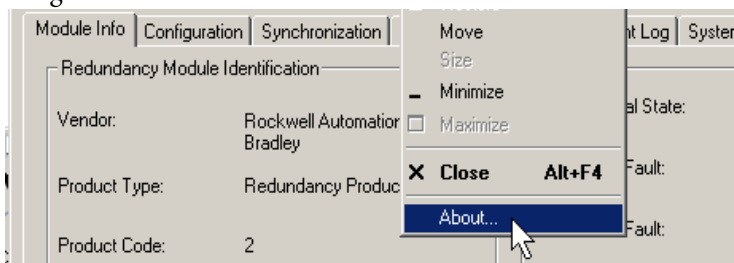


3. Right-click your redundancy module and choose Module Configuration.

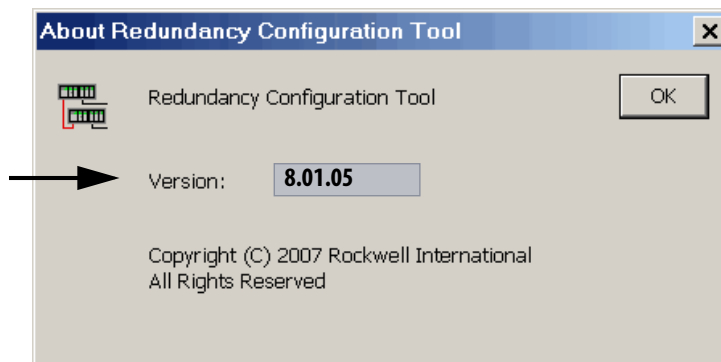


The Module Configuration dialog box opens.

4. Right-click the title bar and choose About.



The About dialog box opens and indicates the RMCT version.



Download and Install Redundancy Firmware Bundle

Download and install the redundancy firmware revision bundle from the Rockwell Automation Support website at:

<http://www.rockwellautomation.com/support>.

The redundancy firmware bundles are posted in the Downloads section and are classified in the Control Hardware category.

Update EDS Files

If needed, obtain EDS files for modules in your system from the Rockwell Automation Support website at:

<http://www.rockwellautomation.com/resources/eds/>.

Once you have downloaded the required EDS file, launch the EDS Hardware Configuration Tool by choosing Start > Programs > Rockwell Software > RSLinx Tools > EDS Hardware Installation Tool.

The tool then prompts you to Add or Remove EDS files.

Prepare the Redundant Chassis for the Firmware Upgrade

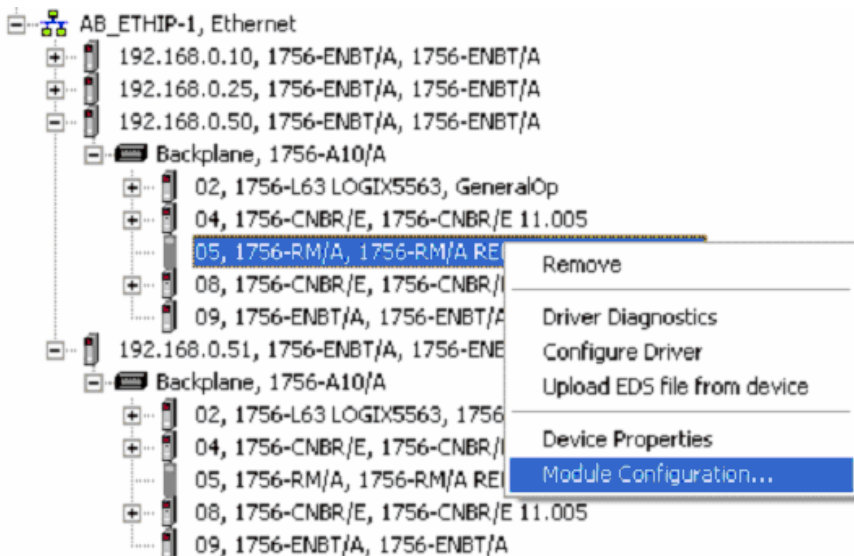
Complete these steps to prepare both the primary and secondary redundant chassis for redundancy firmware upgrades.

1. Set the keyswitch of the primary and secondary controllers to REM.

If the redundant controllers are not in Remote Program (REM) mode, the redundancy firmware upgrade cannot be completed.

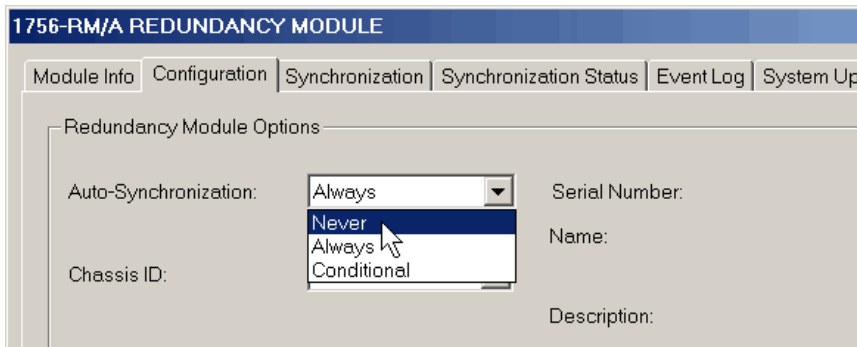
2. Open RSLinx Classic software and browse to the redundancy module.

3. Right-click the redundancy module and choose Module Configuration.



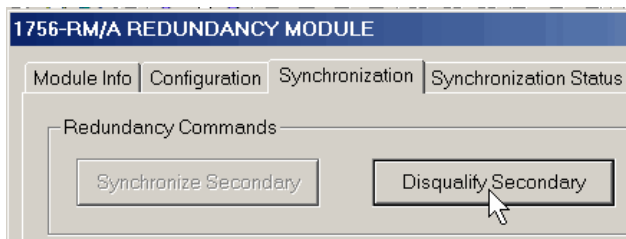
4. Click the Configuration tab.

5. From the Auto-Synchronization pull-down menu, choose Never.



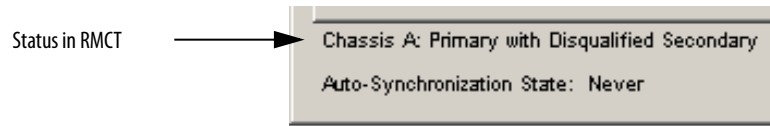
6. Click Apply, then click Yes.

7. Click the Synchronization tab.



8. Click Disqualify Secondary, then click Yes.

The secondary chassis is disqualified as indicated at the bottom-left of the RMCT and on the redundancy module's status display.



9. Click OK and close the RMCT.

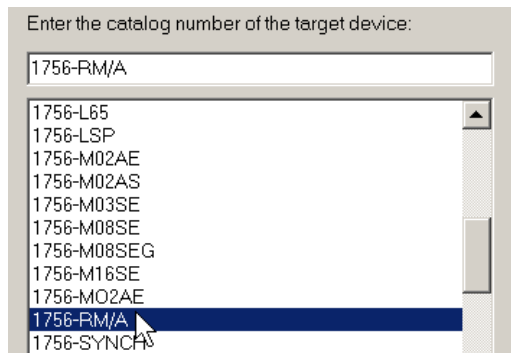
Closing the RMCT helps prevent a timeout from occurring when the redundancy module's firmware is upgraded.

Update Primary 1756-RM or 1757-SRM Module Firmware

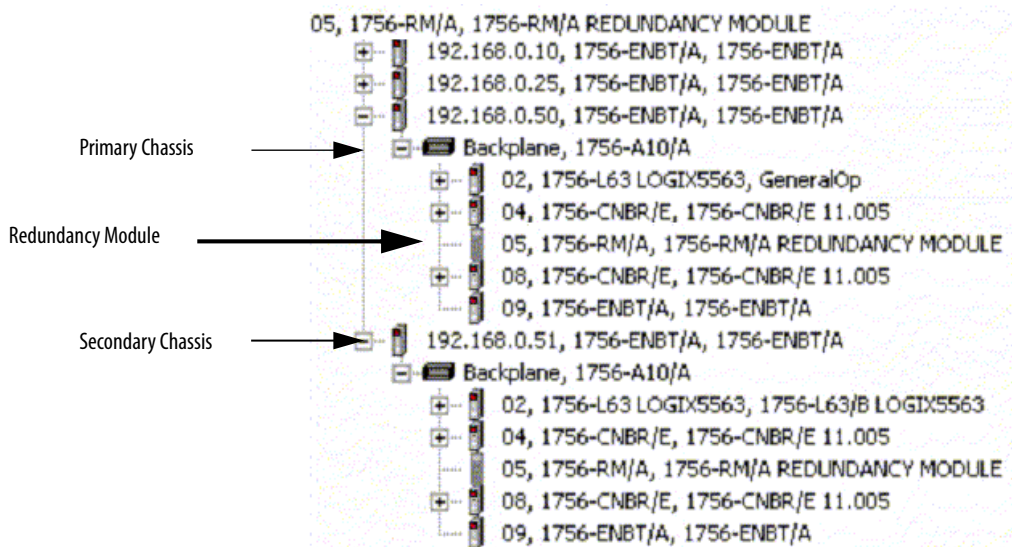
Wait 45 seconds before you begin updating the 1756-RM or 1757-SRM firmware. During this time, the redundancy module conducts internal operations to prepare for an upgrade.

Complete these steps to upgrade the firmware of modules in the secondary chassis.

1. Launch ControlFlash software and click Next.
2. Select the redundancy module catalog number and click Next.



3. Browse to the redundancy module and select it.

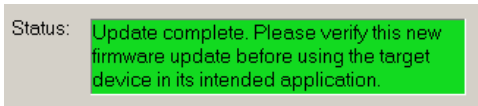


4. Click OK.

5. Select the firmware revision to upgrade to and click Next.

6. Click Finish.

The firmware begins to update. When the upgrade is complete, the Update status dialog box indicates completion.



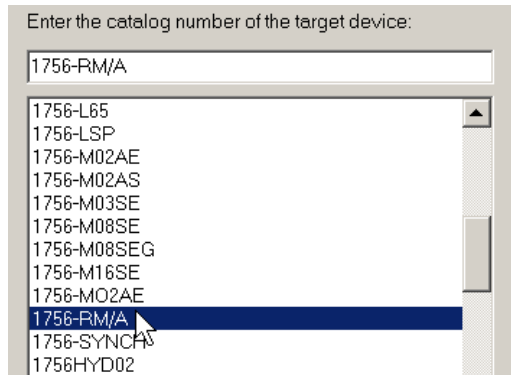
Update the Secondary Chassis Firmware

Wait 45 seconds before you begin updating the secondary chassis firmware. During this time, the redundancy module conducts internal operations to prepare for an upgrade.

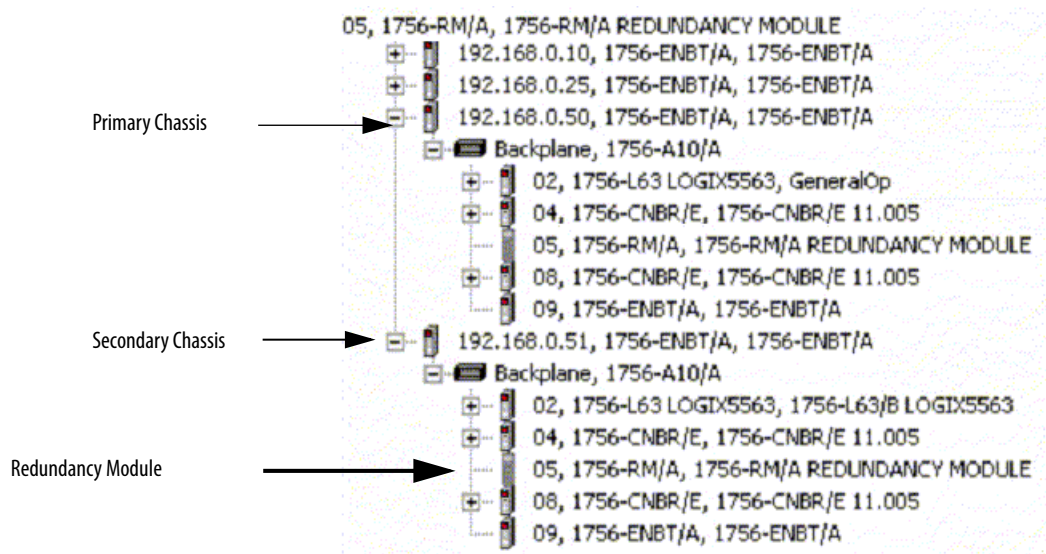
Complete these steps to upgrade the firmware of modules in the secondary chassis.

1. Launch ControlFlash software and click Next.

2. Select the redundancy module catalog number and click Next.



3. Browse to the redundancy module and select it.



4. Click OK.
5. Select the firmware revision to upgrade to and click Next.
6. Click Finish.

The firmware begins to update. When the upgrade is complete, the Update status dialog box indicates completion.

Status: Update complete. Please verify this new firmware update before using the target device in its intended application.

7. If you are replacing and upgrading your controller hardware, remove the controller from the secondary chassis and replace it with the new controller.

IMPORTANT If you are replacing and upgrading your redundant controllers, verify that the planned secondary controller provides the same, or greater, memory as the primary controller.

Use this table to determine if your planned primary and secondary controllers can be used together in the redundant chassis.

Primary Controller	Compatible Secondary Controller
1756-L61	1756-L61, 1756-L62, 1756-L63, 1756-L64
1756-L62	1756-L62, 1756-L63, 1756-L64
1756-L63	1756-L63, 1756-L64
1756-L64	1756-L64

8. Complete steps [2...6](#) for each module in the secondary chassis, including the new controller, if applicable.

Once you have upgraded the firmware for each of the modules in the secondary chassis, continue by preparing the RSLogix 5000 project for the upgrade.

Prepare the RSLogix 5000 Project for the Upgrade

Complete these steps to prepare the RSLogix 5000 program and controllers for the upgrade.

1. Launch RSLogix 5000 programming software and go online with the controller.
2. Verify that the watchdog time is set to a value that corresponds with the requirements of the redundancy firmware revision and your application.

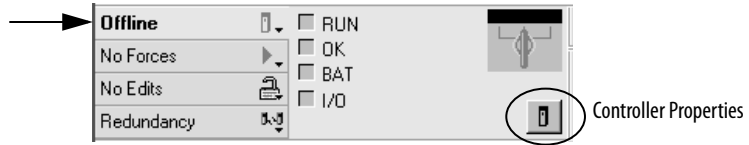
See the [Minimum Value for the Watchdog Time](#) section on [page 19](#) for information about calculating the minimum watchdog time.

3. Cancel or assemble any pending test edits.
4. Remove all SFC forces from the project.
5. Verify that no changes need to be made to:
 - I/O forces.
 - I/O configuration.

After this step, changes to I/O cannot be made until after the redundancy firmware upgrade is complete and both chassis are synchronized.

6. Save the project.

7. Go offline.



8. Click Controller Properties.

9. Click Change Controller.

Vendor:	Allen-Bradley	
Type:	1756-L63 ControlLogix5563 Controller	Change Controller...
Revision:	16.52	

10. Specify the controller revision you are updating to.

11. If you installed a new controller while upgrading the primary chassis firmware, specify the new controller catalog number.

12. Click OK.

13. Access the Module Properties for each communication module in the chassis and specify the module firmware revision you are upgrading to.

The screenshot shows the 'New Module' dialog box with the following fields: Type (1756-ENBT/A 1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media), Vendor (Allen-Bradley), Parent (Local), Name (ENBT_mod), Description, Slot (3), Revision (4), Address / Host Name (IP Address selected), and Electronic Keying (Compatible Keying). The 'Revision' field is circled in red.

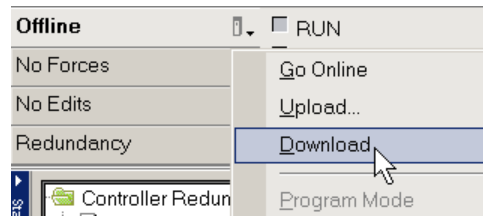
TIP

If you are unable to specify the new revision, you may need to change the Electronic Keying parameter to Compatible Keying.

14. Save the project.

15. Download the project to the secondary controller.

The secondary controller is at the higher network address of the two available for the redundant chassis.



16. After the download is complete, go offline.

You are now ready to lock the system and initiate a locked switchover to update the primary chassis. Continue with [Lock and Switchover the System for Update](#) on [page 30](#).

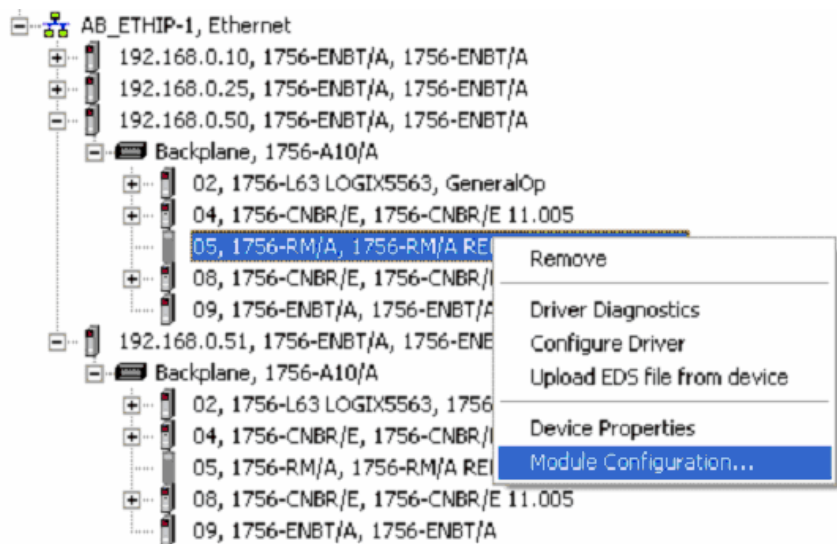
Lock and Switchover the System for Update

Once you have downloaded the RSLogix 5000 project you prepared, complete these steps to lock your system and initiate a switchover.

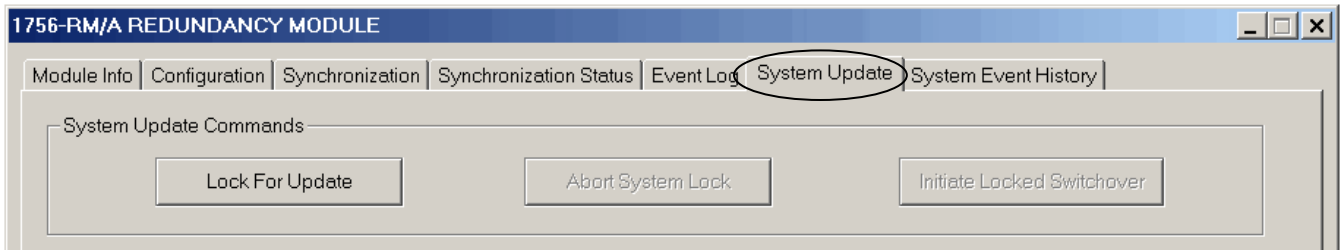
IMPORTANT

- Remain offline while completing these steps.
- Once you have locked the system, do not abort the system lock. Aborting the system lock during this procedure clears the project from the secondary controller.
- Do not disconnect any communication cables while completing these steps.
- Completing a locked switchover causes SFC instructions to be reset to their initial state. This may result in SFC instructions executing twice.

1. Open the RMCT for the 1756-RM module in the primary chassis.



- Click the System Update tab.



- Click Lock for Update, then click Yes.
- Wait for the system to lock.

The System Update Lock Attempts log indicates when the system lock is complete.

The screenshot shows a table titled 'System Update Lock Attempts' with the following data:

System Lock History	Initiation Time	Status	Result
N	6/2/2009 22:45:07:175	Locked	System locked at : 6/2/2009 22:45:38:849
N-1	—	Not attempted	—
N-2	—	Not attempted	—
N-3	—	Not attempted	—

- Click Initiate Locked Switchover, then click Yes.

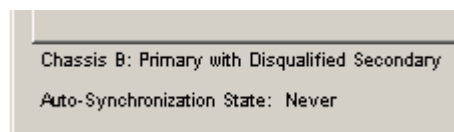


This step results in your secondary chassis assuming control and becoming the primary chassis. When the switchover is complete, the Locked Switchover Attempts log indicates success.

The screenshot shows a table titled 'Locked Switchover Attempts' with the following data:

Locked Switchover History	Initiation Time	Status	Result
N	6/2/2009 22:47:21:032	Success	Locked switchover completed at : 6/2/2009 22:47:21:035
N-1	—	Not attempted	—
N-2	—	Not attempted	—
N-3	—	Not attempted	—

In addition to the log, the chassis status indicated in the bottom of the RMCT updates to reflect the switchover.

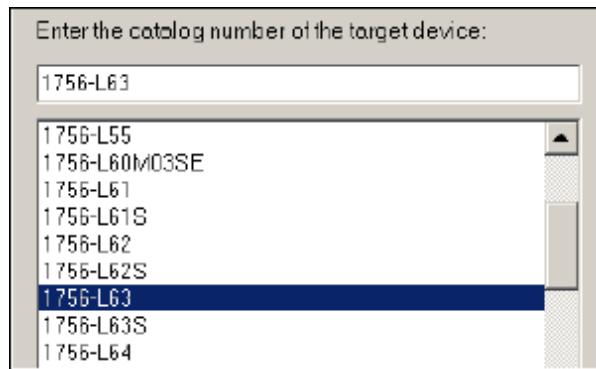


Once your locked switchover is complete, continue by updating the firmware of the modules in the new secondary chassis.

Update the New Secondary Chassis Firmware

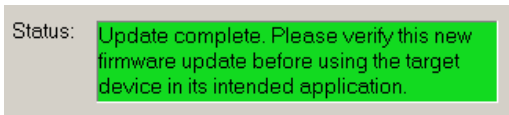
Verify that your chassis have been locked for update and that the locked switchover has completed successfully. Then complete these steps to upgrade the firmware of all of the modules in the new secondary chassis, except for the 1756-RM or 1757-SRM module that has already been updated (see the [Update Primary 1756-RM or 1757-SRM Module Firmware](#) section on [page 25](#)).

1. Launch ControlFlash software and click Next.
2. Select the module catalog number and click Next.



3. Browse to the module and select it.
4. Click OK.
5. Select the firmware revision to upgrade to and click Next.
6. Click Finish.

The firmware begins to update. When the upgrade is complete, the Update status dialog box indicates completion.



7. If you are replacing and upgrading your controller hardware, remove the controller from the secondary chassis and replace it with the new controller.

IMPORTANT

If you are replacing and upgrading your redundant controllers, verify that the planned secondary controller provides the same, or greater, memory as the primary controller.

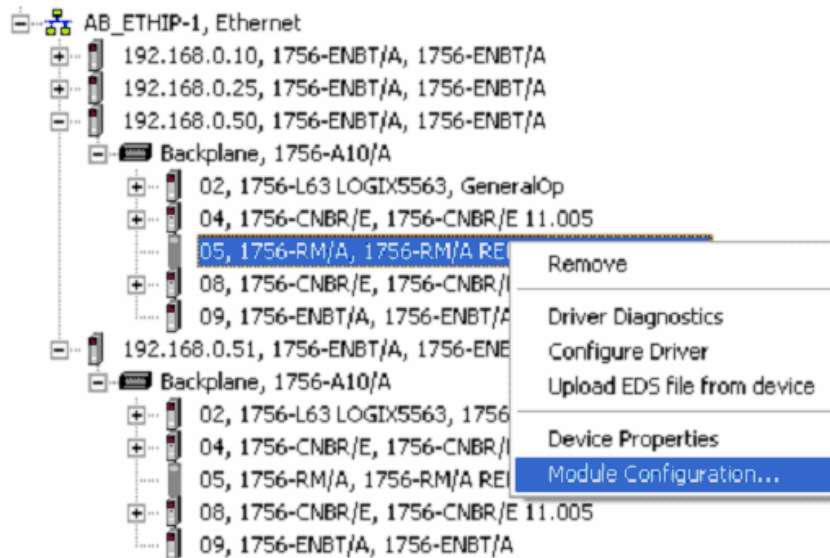
8. Complete steps [2...6](#) for each module in the new secondary chassis, including the new controller, if applicable.

Once you have upgraded the firmware for each of the modules in the new secondary chassis, continue by synchronizing the redundant chassis.

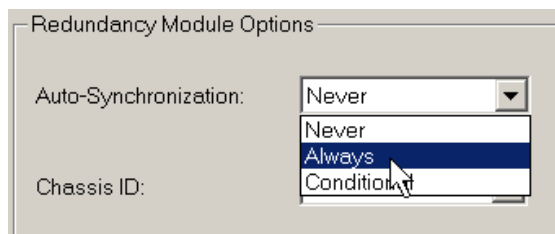
Synchronize the Redundant Chassis

Complete these steps to synchronize the redundant chassis after firmware in both chassis has been upgraded to the same revision.

1. Launch the RMCT for the 1756-RM module in the primary chassis.



2. Click the Configuration tab.
3. From the Auto-Synchronization pull-down menu, choose the frequency that suits your application.



4. Click Apply, then click Yes.
5. Set the redundancy module date and time according to your preference.
6. Click OK.
7. Close the RMCT.

Your upgrade of the redundant system is now complete.

Migrating from 1757-SRM Modules to 1756-RM Modules

These sections describe how to migrate your standard redundancy system from 1757-SRM modules to 1756-RM modules. Tasks specific to migrating include the following:

- [Before You Begin on page 34](#)
- [Upgrade 1756-RM Module Firmware on page 34](#)
- [Replace the 1757-SRM Modules with 1756-RM Modules on page 35](#)

Before You Begin

If your standard redundancy system is operating at standard redundancy firmware revision 16.053, or earlier, complete the tasks in [Upgrade from Revision 15.xxx, or Later on page 20](#) **before** you migrate from 1757-SRM modules to 1756-RM modules.

Also, prepare to replace the fiber-optic cable that connects the redundancy modules. You replace the 1756-SRC1 cable (multi-mode fiber with SC connectors) that connects the 1756-SRM modules with a 1756-RMC1 cable (single-mode fiber with LC connectors) that connects the 1756-RM modules.

Upgrade 1756-RM Module Firmware

1756-RM modules at boot firmware must be upgraded to standard redundancy revision 16.056 in a nonredundant chassis before being placed in a redundant chassis. We strongly suggest that you upgrade the 1756-RM module in a nonredundant chassis that has an empty slot. For example, an empty slot in a remote I/O chassis is ideal.

If no slots are available in a nonredundant chassis, complete these steps to upgrade your 1756-RM module from boot firmware in a redundant chassis.

1. Disqualify the chassis pair.
2. Remove power from the secondary chassis.
3. Disconnect the intermodule fiber-optic cable that connects the 1757-SRM modules.
4. Uninstall the 1757-SRM from the primary chassis.
5. Install the 1756-RM module in a now-empty slot that the 1757-SRM was in.
6. Wait for the 1756-RM module status display to indicate APPLICATION UPDATE REQUIRED.
7. Use ControlFlash software to upgrade the 1756-RM module firmware to revision 16.056.

8. When the upgrade is complete, uninstall the 1756-RM module.
9. Install the second 1756-RM module in the slot.
10. Use ControlFlash software to upgrade the second 1756-RM module firmware to revision 16.056.
11. Uninstall the second 1756-RM module.
12. Install the 1757-SRM into the slot and connect the intermodule fiber-optic cable that connects the two redundancy modules.

Replace the 1757-SRM Modules with 1756-RM Modules

After you have upgraded the 1756-RM module firmware to revision 16.056, complete these steps to replace the 1757-SRM modules with the 1756-RM modules.

1. If not yet disqualified, disqualify the redundant chassis.
2. Disconnect the intermodule fiber-optic cable from both of the 1757-SRM modules.
3. Remove the 1757-SRM modules in each chassis.
4. Install an 1756-RM module in one of the empty slots in each chassis.
5. Connect the intermodule fiber-optic cable between the 1756-RM modules.

IMPORTANT

The 1756-RM modules require a different intermodule fiber-optic cable than used with the 1757-SRM module. Connect the appropriate cable between the 1756-RM modules.

6. Wait for the 1756-RM modules to indicate PRIM and DISQ.
7. Use RSLinx Classic software to access the RMCT to do the following:
 - specify the date and time.
 - configure redundancy settings according to your application.
 - synchronize the system.

Replace 1756-RM/A or 1756-RM/B Redundancy Modules with 1756-RM2/A Redundancy Modules

You can replace your current redundancy modules with 1756-RM2/A modules without initiating a switchover.

TIP

For the following steps, 'redundancy modules' refers to 1756-RM/A or 1756-RM/B modules.

Before executing these steps, review the most recent redundancy bundle release notes to determine the appropriate 1756-RM2 firmware revision and RMCT version required. You can find this information at the Product Compatibility and Download Center at

<http://www.rockwellautomation.com/support/downloads.html>.

1. Install the compatible version of the RMCT software.

You must shut down RSLinx Classic software to perform the installation, and then restart RSLinx Classic software after the installation is complete.

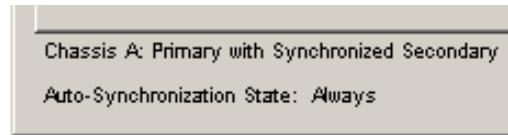
2. On the RMCT Configuration tab, from the Auto-Synchronization pull-down menu, choose Never.
3. Using the RMCT, disqualify the redundant chassis pair (if not already disqualified.)
4. Unplug the fiber cable on both of the redundancy modules.
5. Close any open RMCT sessions connected to the current redundancy modules that are being replaced.
6. Remove the redundancy module pair (in any order) from the redundant chassis.
7. Insert the 1756-RM2/A redundancy module pair (in any order) in the redundant chassis into the same slots as the redundancy modules.
8. If not already installed, use RSLinx Classic software to upload the EDS file for the 1756-RM2/A module.
 - If needed, obtain the EDS file for the 1756-RM2/A module. Right-click the module in RSWho and choose 'Upload EDS file from device'.
9. Update the primary and secondary 1756-RM2/A modules to the appropriate firmware revision.
10. Reconnect the fiber cable on either CH1 or CH2 of the 1756-RM2/A redundancy module.
11. Optional: Connect a second fiber cable on the remaining channel for fiber redundancy.
12. Wait for at least 45 seconds after connecting the fiber cables.
13. Launch the RMCT again for the newly-installed 1756-RM2/A modules.
14. On the RMCT Configuration tab, from the Auto Synchronization pull-down menu, choose your original value.
15. Using the RMCT, synchronize the system again (if it is not already qualified).

Store a Project to Nonvolatile Memory While Your Process Is Running

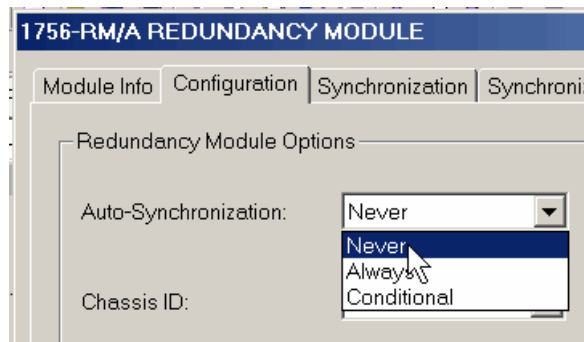
Use this procedure to store an updated project and firmware to the nonvolatile memory of the controller while your process is running.

1. Verify that the redundant chassis are synchronized.

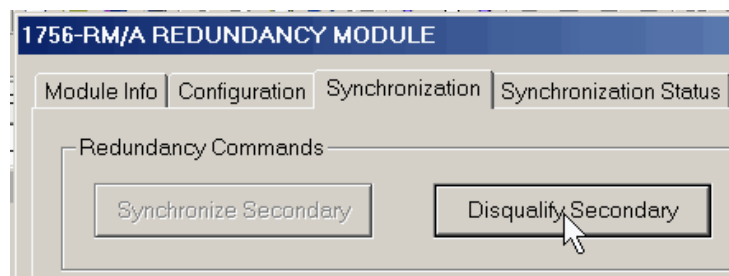
If the redundant chassis are not synchronized, synchronize them before continuing with the next step.



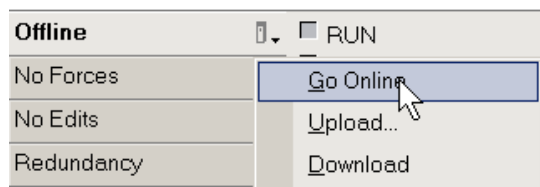
2. In the RMCT, click the Configuration tab and from the Auto-Synchronization pull-down menu, choose Never.



3. In the Synchronization tab, click Disqualify Secondary.



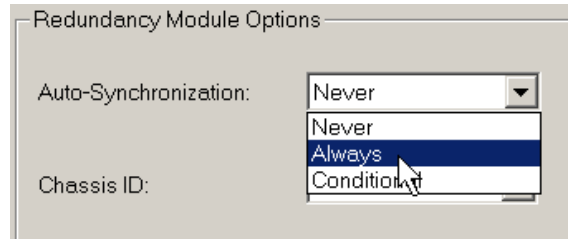
4. In RSLogix 5000 programming software, go online with the secondary controller.



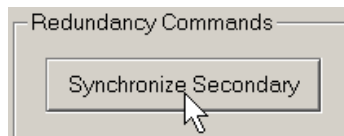
- Use the steps described in the Logix5000 Controllers Nonvolatile Memory Programming Manual, publication [1756-PM017](#) to store the project.

IMPORTANT Remain offline after you have stored the project to nonvolatile memory. You must stay offline through the remainder of this procedure.

- In the RMCT, set the Auto-Synchronization parameter according to your preference.



- Synchronize the chassis.



Additional Resources

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

Resource	Description
ControlLogix Redundancy System User Manual, publication 1756-UM523	Provides design, installation, and troubleshooting information specific to the standard redundancy system.
Rockwell Automation's Technical Support Knowledgebase, http://www.rockwellautomation.com/knowledgebase/	Provides details about how to assemble and mount the controller, how to upgrade firmware, and controller technical specifications.
ProcessLogix and ControlLogix System Redundancy Module Installation Instructions, publication 1757-IN092	Contains information on how to install the 1757-SRM, Series B ProcessLogix and ControlLogix System Redundancy Module into the ProcessLogix or ControlLogix redundant chassis pair.
ControlFlash Firmware Upgrade Kit Quick Start, publication 1756-QS105	Contains information on how to upgrade module firmware.
ControlLogix Controllers User Manual, publication 1756-UM001	Contains information on how to install, configure, program, and operate a ControlLogix system.
Product Certifications website, http://ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://literature.rockwellautomation.com>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Notes:

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 manuals, 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. You can also visit our Knowledgebase at <http://www.rockwellautomation.com/knowledgebase> for FAQs, technical information, support chat and forums, software updates, and to sign up for product notification updates.

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

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/support/americas/phone_en.html , or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation 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, 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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