**AB** *Allen-Bradley*

# ControlLogix Enhanced Redundancy System, Revision 20.055_kit5

Redundancy Module Catalog Numbers
1756-RM, 1756-RMXT, 1756-RM2, 1756-RM2XT

Controller Catalog Numbers
1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75

Communication Module Catalog Numbers
1756-CN2/B, 1756-CN2/C, 1756-CN2R/B, 1756-CN2R/C, 1756-CN2RXT/B, 1756-CN2RXT/C, 1756-CN2RK/C, 1756-EN2T, 1756-EN2TR, 1756-EN2TXT, 1756-EN2TRXT, 1756-EN2TRK/C, 1756-EN2TK/D, 1756-EN2F/A, 1756-EN2F/B, 1756-EN2F/C

| IMPORTANT | Throughout this publication, the following applies: |
|---|---|
| | **Ethernet Communication Modules** |
| | – References to the 1756-EN2T/B and 1756-EN2TR/B (or earlier) modules also apply to the 1756-EN2TRXT/B (or earlier) modules. |
| | – References to the 1756-EN2T/C and 1756-EN2TR/C (or earlier) modules also apply to the 1756-EN2TRXT/C (or earlier) modules. |
| | – References to the 1756-EN2T/D and 1756-EN2TR/D modules also apply to the 1756-EN2TRXT/D modules. |
| | **ControlNet Communication Modules** |
| | – References to the 1756-CN2/B modules also apply to the 1756-CN2R/B, 1756-CN2RXT/B modules. |
| | – References to the 1756-CN2/C modules also apply to the 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C, modules. |
| | – Catalog numbers 1756-RM, 1756-RM2, and 1756-RM2XT refer to any series modules. |

These release notes describe enhancements, corrected anomalies, known anomalies, restrictions, and application notes regarding enhanced redundancy system revision 20.055_kit5 or earlier.

## Product Release Notes

Product release notes for the individual products that are part of this ControlLogix® Enhanced Redundancy bundle are available online within the Product Compatibility and Download Center.

For example, you can access release note information specific to the 1756-EN2T ControlLogix EtherNet/IP bridge.

For more information on product release notes, see .

## About This Enhanced Redundancy Firmware Bundle

This enhanced redundancy firmware bundle, which is identified as revision 20.055_kit5, contains series firmware revisions for each of the modules that are listed in Table 1, Required Series and Firmware Revisions for Components Used in an Enhanced Redundancy System, Revision 20.055_kit5

You can download the firmware bundle at the Product Compatibility and Download Center: http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page?.

Information that has been added or changed since the last revision of this publication is indicated by a change bar as shown next to this paragraph. In addition to information specific to the most recent firmware revision, the information from previous minor revisions is retained in these release notes.

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 | When designing, installing, and operating the redundant chassis pair (RCP) for this enhanced redundancy system revision, you can use only the modules that are specified in Table 1, Required Series and Firmware Revisions for Components Used in an Enhanced Redundancy System, Revision 20.055_kit5. |
|---|---|
| | Also, keep in mind the series and firmware revision requirements listed **apply only to components used in the redundant chassis pair,** not to components used with the redundancy system outside the redundant chassis pair. |

This enhanced redundancy system revision includes the following:

- Support using the 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C modules with firmware revision 25.005
- Support using the 1756-EN2F/C modules with firmware revision 10.009

**Table 1 - Required Series and Firmware Revisions for Components Used in an Enhanced Redundancy System, Revision 20.055_kit5**

| Cat. No. | Module Description | Series | Firmware Revision |
|---|---|---|---|
| 1756-CN2 | ControlLogix ControlNet bridge module | B | 20.020 |
| 1756-CN2R | ControlLogix redundant media ControlNet bridge module | | |
| 1756-CN2RXT | ControlLogix-XT™ redundant media ControlNet bridge module | | |
| 1756-CN2[1] | ControlLogix ControlNet bridge module | C | 25.005 |
| 1756-CN2R[1] | ControlLogix redundant media ControlNet bridge module | | |
| 1756-CN2RXT[1] | ControlLogix-XT redundant media ControlNet bridge module | | |
| 1756-CN2RK[1] | ControlLogix redundant ControlNet bridge (conformal coated) module | | |
| 1756-EN2T | ControlLogix EtherNet/IP communication module | D | 10.007[2][3] |
| | | C (or earlier) | 5.008 or 5.028[4][5] |
| 1756-EN2TR | ControlLogix EtherNet/IP communication module | C | 10.007[3][6] |
| | | B (or earlier) | 5.008 or 5.028[5][7] |
| 1756-EN2F | ControlLogix EtherNet/IP fiber communication module | C | 10.009[8] |
| | | B (or earlier) | 5.008 or 5.028[4][5] |
| 1756-EN2TXT | ControlLogix-XT EtherNet/IP communication module | C (or earlier) | 5.008 or 5.028[4][5] |
| | | D | 10.007[2][3] |

**Table 1 - Required Series and Firmware Revisions for Components Used in an Enhanced Redundancy System, Revision 20.055_kit5  (Continued)**

| Cat. No. | Module Description | Series | Firmware Revision |
|---|---|---|---|
| 1756-EN2TRXT | ControlLogix-XT EtherNet/IP redundant communication module | C | 10.007[3][6] |
|  |  | B | 5.028[5][7] |
| 1756-EN2TRK | ControlLogix EtherNet/IP conformal coated communication bridge module | C | 10.007[3][6] |
| 1756-EN2TK | ControlLogix EtherNet/IP conformal coated communication bridge module | D | 10.007[2][3] |
| 1756-L61 | ControlLogix5561 controller | Any | 20.055 |
| 1756-L62 | ControlLogix5562 controller |  |  |
| 1756-L63 | ControlLogix5563 controller |  |  |
| 1756-L63XT | ControlLogix-XT controller |  |  |
| 1756-L64 | ControlLogix5564 controller |  |  |
| 1756-L65 | ControlLogix5565 controller |  |  |
| 1756-L71 | ControlLogix5571 controller |  |  |
| 1756-L72 | ControlLogix5572 controller |  |  |
| 1756-L73 | ControlLogix5573 controller |  |  |
| 1756-L73XT | ControlLogix-XT controller |  |  |
| 1756-L74 | ControlLogix5574 controller |  |  |
| 1756-L75 | ControlLogix5575 controller |  |  |
| 1756-RM2 | ControlLogix redundancy module | Any | 20.005 |
| 1756-RM2XT | ControlLogix-XT redundancy module |  |  |
| 1756-RM | ControlLogix redundancy module | Any | 3.003 |
| 1756-RMXT | ControlLogix-XT redundancy module |  |  |

(1)   **IMPORTANT:** The 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C modules do not support firmware revisions previous to revision 25.004. Do not attempt to update the firmware to earlier revisions.

(2)   **IMPORTANT:** The 1756-EN2T/D modules do not support firmware revisions previous to revision 10.006. Do not attempt to update the firmware to earlier revisions.

(3)   Firmware revision 10.006 or later is digitally signed. For more information on digitally signed firmware, see page 5.

(4)   **IMPORTANT:** The 1756-EN2T/C (or earlier) modules do not support firmware revision 10.006 or later. Do not attempt to update the firmware to revision 10.006 or later.

(5)   Firmware revision 5.028 is digitally signed firmware. Firmware revision 5.008 is unsigned firmware. For more information on digitally signed firmware, see page 5.

(6)   **IMPORTANT**: The 1756-EN2TR/C modules do not support firmware revisions previous to revision 10.007. Do not attempt to update the firmware to previous revisions.

(7)   **IMPORTANT:** The 1756-EN2TR/B (or earlier) modules do not support firmware revision 10.007. Do not attempt to update the firmware to revision 10.007.

(8)   **IMPORTANT:** The 1756-EN2F/C modules do not support firmware revisions previous to revision 10.009. Do not attempt to update the firmware to a previous version.

## 1756-EN2T, 1756-EN2TR, and 1756-EN2F Modules Digitally signed Firmware

Digitally signed firmware provides more security over the unsigned firmware. This firmware is different based on the EtherNet/IP communication modules you use.

| Cat. No. | Supported Firmware Revisions | Digitally signed Firmware | Included with the Enhanced Redundancy System, Revision 20.055_kit5 Bundle |
|---|---|---|---|
| 1756-EN2T/D | 10.006 or later | Yes | Yes |
| 1756-EN2T/C (or earlier) | 5.008 | No | Yes |
| | 5.028 | Yes | No |
| 1756-EN2TR/C | 10.007 | Yes | Yes |
| 1756-EN2TR/B (or earlier) | 5.008 | No | Yes |
| | 5.028 | Yes | No |
| 1756-EN2F/C | 10.009 | Yes | Yes |
| 1756-EN2F/B (or earlier) | 5.008 | No | Yes |
| | 5.028 | Yes | No |

Firmware revision 5.028 is not included in the enhanced redundancy system, revision 20.055_kit5 firmware bundle. If you want to use it you have to download and install this firmware separately.

> **IMPORTANT**  When you install the digitally signed firmware, that is, firmware revision 5.028, into a 1756-EN2T/C (or earlier), 1756-EN2TR/B (or earlier), or 1756-EN2F/B (or earlier) module, the installation makes the module incompatible with some firmware revisions.
>
> For example, after you upgrade firmware, the module supports use of only digitally signed firmware. Any unsigned firmware updates are rejected by the module.

You can download firmware revision 5.028 and the enhanced redundancy system, revision 20.055_kit5 firmware bundle at the Product Compatibility and Download Center:
http://www.rockwellautomation.com/rockwellautomation/support/pcdc.page

The firmware bundle is identified as V20.055_kit5.

> **TIP**  Select the base catalog number in ControlFlash when upgrading extended temperature or conformal coated modules.
>
> For example, select the 1756-EN2TR when upgrading a 1756-EN2TRXT module.
>
> Extended temperature and conformal coated modules use the same Redundancy module ControlFlash kit.

# Compatible Software Versions

Use these versions of software with this redundancy firmware bundle.

**Table 2 - Required Software Versions for Enhanced Redundancy System, Revision 20.055_kit5**

| Software | Required Software Version, Min |
|---|---|
| CompareTool | 3.20.02 |
| ControlFLASH™ | 12.01.00 |
| FactoryTalk Services Platform | 2.50.00 (CPR 9, SR5) |
| FactoryTalk Activation | 3.50.00 (CPR 9, SR5) |
| FactoryTalk Alarms and Events | 2.40.00 (CPR 9, SR4) |
| FactoryTalk AssetCentre | 4.00.00 |
| FactoryTalk Batch | 11.00.00[2] |
| FactoryTalk View Site Edition | 6.10.00 (CPR 9, SR4) |
| Redundancy Module Configuration Tool | 8.02.01 |
| RSLinx® Enterprise | 5.50.04 (CPR 9, SR5) |
| RSLinx Classic | 2.59.01 (CPR 9, SR5) |
| RSLogix™5000[1] | 20.01.00 (CPR 9, SR5) |
| | 20.03.00 (CPR9, SR5) |
| RSNetWorx™ for ControlNet | 11.00.00 (CPR 9, SR5) |
| RSNetWorx for EtherNet/IP | |

(1)   If you choose to use RSLogix 5000 software, version 20.03.00, we strongly recommend that you read Upgrade the RSLogix 5000 Software Version on page 30 before proceeding.

(2)   Use the most recent FactoryTalk Batch Patch Roll-up with this enhanced redundancy firmware revision. For the most recent patch roll-up, see Rockwell Automation Knowledgebase Answer ID 59058, accessible at:
http://www.rockwellautomation.com/knowledgebase/.

For system requirements, go to http://www.rockwellautomation.com/rockwellsoftware/design/rslogix5000/sysreq.html.

## About the Redundancy Module Configuration Tool

You can use 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT redundancy modules to commission a redundant system. These modules operate in a plug-and-play manner, that is, they can commission a system without any additional programming. However, there is more functionality available if you use the modules with the Redundancy Module Configuration Tool (RMCT).

This enhanced redundancy system revision requires the RMCT, version 8.02.01 that is packaged with this enhanced redundancy system revision bundle. The About screen for the RMCT displays 8.2.1.0 but it's the correct version.

```
About Redundancy Configuration Tool                    [×]

 ▥▥▥      Redundancy Configuration Tool          [  OK  ]
 ▥▥▥

          Version:        8.2.1.0

          Copyright (c) 2011 Rockwell Automation Technologies, Inc.
          All Rights Reserved
```

You can use the RMCT with the redundancy modules to complete these tasks:

- View error diagnostics

- View partnered modules' qualification and compatibility status

- Set Auto-Synchronization parameters

- View and set Chassis ID parameters (Chassis A, Chassis B)

- Identify noncompliant modules for removal

- Configure redundancy system parameters

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**IMPORTANT**  This publication documents Corrected Anomalies and Known Anomalies associated with the RMCT. We recommend that you read these anomaly descriptions before using the RMCT, version 8.02.01.

Also, if you need to upgrade your RMCT separately from downloading this enhanced redundancy system revision or by using RSLinx Classic software, version 2.59.00, see Upgrade the Redundancy Module Configuration Tool on page 48.

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# Enhancements

These enhancements are provided with enhanced redundancy system, revision 20.055_kit5.

**Table 3 - Enhancements Provided with Enhanced Redundancy System, Revision 20.055_kit5**

| System Component | Enhancement |
|---|---|
| 1756-CN2/C support | The 1756-CN2, 1756-CN2R, 1756-CN2RXT, and 1756-CN2RK modules are available with firmware revision 25.005 in this enhanced redundancy bundle. |
| 1756-EN2F/C support | The 1756-EN2F/C modules are available with firmware revision 10.009 in the enhanced redundancy bundle. |

These enhancements have been made in previous firmware revisions.

**Table 4 - Enhancements Provided with Enhanced Redundancy System, Revision 20.055_kit4 (or earlier)**

| System Components | Enhanced Redundancy System Revision | Enhancement |
|---|---|---|
| 1756-CN2/C support | 20.055_kit4 | The 1756-CN2, 1756-CN2R, 1756-CN2RXT, 1756-CN2RK modules are available with firmware revision 25.004 in this enhanced redundancy bundle. |
| 1756-RM2 firmware | | Upgraded Firmware Revision<br>The 1756-RM2 and 1756-RM2XT modules use firmware revision 20.005 in this enhanced redundancy bundle. |
| Redundancy Module Configuration Tool | | The RMCT has been revised to version 8.02.01. |
| ControlLogix EtherNet/IP communication module, 1756-EN2TR/C | 20.055_kit3 | New Module Series and Firmware Revision<br>The 1756-EN2TR/C module, firmware revision 10.007, is available.<br>**IMPORTANT**: The 1756-EN2TR/C modules do not support firmware revisions previous to revision 10.007. Do not attempt to flash the firmware to previous revisions. |
| | | Product Resiliency Improvement<br>This release includes enhancements that are intended to improve product resiliency to potentially disruptive activities. These enhancements have been verified not to affect product safety, performance, expected life, configuration, or operation of the product. Rockwell Automation advises customers to follow good Industrial Control System (ICS) security practices that include regular product updates. To help ensure authenticity, obtain product updates and new releases directly from Rockwell Automation. |
| | | With the 1756-EN2TR/C module, firmware revision 10.007, message performance is improved over earlier revisions. |
| ControlLogix EtherNet/IP communication module, 1756-EN2T/D | | Upgraded Firmware Revision<br>The 1756-EN2T/D module uses firmware revision 10.007 in this enhanced redundancy bundle. |

**Table 4 - Enhancements Provided with Enhanced Redundancy System, Revision 20.055_kit4 (or earlier)  (Continued)**

| System Components | Enhanced Redundancy System Revision | Enhancement |
|---|---|---|
| ControlLogix EtherNet/IP communication module, 1756-EN2T/D | 20.055_kit2 | The 1756-EN2T/D module, firmware revision 10.006, is available.<br>**IMPORTANT**: The 1756-EN2T/D modules do not support firmware revisions previous to revision 10.006. Do not attempt to update the firmware to previous revisions. |
| | | With the 1756-EN2T/D module, firmware revision 10.006, message performance is improved over earlier revisions. |
| | | Product Resiliency Improvement<br>This release includes enhancements that are intended to improve product resiliency to potentially disruptive activities. These enhancements have been verified not to affect product safety, performance, expected life, configuration, or operation of the product. Rockwell Automation advises customers to follow good Industrial Control System (ICS) security practices that include regular product updates. To help ensure authenticity, obtain product updates and new releases directly from Rockwell Automation. |
| RSLogix 5000 Software | | Option to use RSLogix 5000 software, version 20.03.00<br><br>RSLogix 5000 software, version 20.03.00 includes enhancements that are intended to improve product resiliency to potentially disruptive activities. These enhancements have been verified not to affect product safety, performance, expected life, configuration, or operation of the product.<br><br>**IMPORTANT**: For information on upgrading your RSLogix 5000 software project to version 20.03.00, see Rockwell Automation Knowledgebase Answer ID 565204 - RSLogix 5000 Software, Version 20.03, accessible at: http://www.rockwellautomation.com/knowledgebase/. (log on is required.)<br><br>We strongly recommend that you read the Knowledgebase article, and the associated documents that are referenced within it, before upgrading your RSLogix 5000 software version. |
| Redundancy Module Configuration Tool (RMCT), 1756-RM2 | 20.054_kit1 | Reduction in scan time of up to 35% per sync point in comparison to the 1756-RM/B module, due to higher 1756-RM2 module speed of up to 1000 Mbps. |
| | | Redundant fiber ports for the 1756-RM2 module for crossloading; no single point of failure of a fiber cable. |
| | | The redundancy module firmware now reports back to the RMCT about the version of the RMCT it is compatible with. If there is an incompatibility, the RMCT shows only the Module Info tab that indicates the version that the firmware is compatible with. |
| | | A synchronization process that takes a long time (up to 10 minutes, in the case of a PTP configuration error) to complete can be aborted via the Disqualify button in the RMCT. Without this feature, you must abort qualification by taking a manual action, for example, when you cycle power to the secondary chassis or when you remove the redundancy module under power (RIUP). |
| | | There are new causes added for partner compatibility of communication modules that appear in the RMCT Status tab under Compatibility.<br>For example, the primary and secondary partners are not on the same network (the partners must be communicating on the same network to synchronize), or one or both of the partner's keepers are invalid. Update the keepers to valid and matching keeper values. |

**Table 4 - Enhancements Provided with Enhanced Redundancy System, Revision 20.055_kit4 (or earlier) (Continued)**

| System Components | Enhanced Redundancy System Revision | Enhancement |
|---|---|---|
| 1756-L61<br>1756-L62<br>1756-L63<br>1756-L63XT<br>1756-L64<br>1756-L65<br>1756-L71<br>1756-L72<br>1756-L73<br>1756-L73XT<br>1756-L74<br>1756-L75 | 20.054 | The 375 ms RPI limit has been increased. You can now configure I/O modules to use up to a 750 ms RPI; the same as in a simplex system. |
| | | Beginning with revision 20.054, HMI blind time due to switchover has been reduced.<br>See page HMI Blind Time on page 29. |
| 1756-L71 | | Support added for the 1756-L71 controller for redundancy Logix and Redundancy Module Configuration Tool (RMCT). |
| 1756-EN2F | | Support added for the 1756-EN2F in the Redundancy Module Configuration Tool (RMCT). |
| 1756-EN2T<br>1756-EN2TR | | Sockets are supported in the 1756-EN2T and 1756-EN2TR modules. |
| Security | | To enhance system and device-level security in systems that use our products, Rockwell Automation prescribes validated, defense-in-depth measures and design practices to enhance system and device-level security. For the latest information on security solutions and enhancements, visit http://www.rockwellautomation.com/solutions/security. |
| Redundancy Module Configuration Tool (RMCT),<br>1756-RM | | The redundancy module firmware now reports back to the RMCT about the version of the RMCT that it is compatible with. If an incompatibility exists, the RMCT shows the Module Info tab that indicates the version that the firmware is compatible with. |
| | | An ongoing synchronization process that takes a long time (up to 10 minutes, in the case of a PTP configuration error) to complete can be aborted via the Disqualify button in the RMCT. Without this feature, you must abort qualification by taking a manual action, such as when you cycle power to the secondary chassis, or when you remove the redundancy module under power (RIUP). |
| | | There are new causes added for partner compatibility of communication modules that appear in the RMCT Status tab under Compatibility.<br>For example, the primary and secondary partners are not on the same network (the partners must be communicating on the same network to synchronize), or one or both of the partner's keepers are invalid. Update the keepers to valid and matching keeper values. |

# Corrected Anomalies

The following sections describe anomalies that are corrected in enhanced redundancy system revisions.

## Corrected Anomalies with Revision 20.055_kit5

These anomalies have been corrected in enhanced redundancy system, revision 20.055_kit5.

**Table 5 - Corrected Anomalies in Enhanced Redundancy System, Revision 20.055_kit5**

| Cat. No./System Component | Enhanced Redundancy System Revision | Description |
|---|---|---|
| 1756-CN2/C<br>1756-CN2R/C<br>1756-CN2RXT/C<br>1756-CN2RK | 20.055_kit5 | **CORRECTED:** When the second power supply of a redundant power supply pair powers up, ControlNet interface modules that reside in the same chassis experience an overvoltage condition. The 5V power rail on the interface module briefly exceeds the maximum voltage setting in the Voltage Monitoring System (VMS).<br><div align="right">Lgx00158735</div> |
| | | **CORRECTED:** The Redundancy System Update feature takes several minutes to report that a secondary module with an earlier firmware revision is paired with a primary module that has more recent firmware.<br><div align="right">Lgx00155142</div> |

## Corrected Anomalies with Revision 20.055_kit1 or earlier

These anomalies have been corrected in enhanced redundancy system, revision 20.055_kit1 (or earlier).

**Table 6 - Corrected Anomalies in Enhanced Redundancy System, Revision 20.055_kit1 (or earlier)**

| Cat. No./System Component | Enhanced Redundancy System Revision | Description |
|---|---|---|
| 1756-L61<br>1756-L62<br>1756-L63<br>1756-L63XT<br>1756-L64<br>1756-L65<br>1756-L71<br>1756-L72<br>1756-L73<br>1756-L73XT<br>1756-L74<br>1756-L75 | 20.055_kit1 | **CORRECTED:** When using PowerFlex™ 750 drives with firmware that supports Drives ADC (Automatic Drive Configuration) on powerup, the controller can become stuck in the transition to Run mode. When stuck in the transition to Run mode, the application is not executing and the outputs are not being updated. For more information, see Knowledgebase document 493802. Also refer to Product Notice 2012-10-004.<br>Lgx00140810, Lgx0130112 |

**Table 6 - Corrected Anomalies in Enhanced Redundancy System, Revision 20.055_kit1 (or earlier)  (Continued)**

| Cat. No./System Component | Enhanced Redundancy System Revision | Description |
|---|---|---|
| 1756-L61<br>1756-L62<br>1756-L63<br>1756-L63XT<br>1756-L64<br>1756-L65<br>1756-L71<br>1756-L72<br>1756-L73<br>1756-L73XT<br>1756-L74<br>1756-L75 | 20.054 | **CORRECTED:** During online editing, an anomaly can occur when testing edits to an SFC routine. Normally, test edits are applied to a test SFC routine and verified before accepting them in the program's logic.<br>When this anomaly occurs, test edits are implemented in the online routine. Despite trying to cancel the online editing operation, when the cancelation option appears to cancel the program edits, the edits are, instead, accepted.<br>There are no workarounds for this anomaly.<br><div align="right">Lgx00119071</div> |

**Table 6 - Corrected Anomalies in Enhanced Redundancy System, Revision 20.055_kit1 (or earlier)  (Continued)**

| Cat. No./System Component | Enhanced Redundancy System Revision | Description |
|---|---|---|
| 1756-L61<br>1756-L62<br>1756-L63<br>1756-L63XT<br>1756-L64<br>1756-L65<br>1756-L71<br>1756-L72<br>1756-L73<br>1756-L73XT<br>1756-L74<br>1756-L75 | 20.054 | **CORRECTED:** An anomaly can occur when you nest simultaneous branches in a sequential function chart (SFC) routine as shown below.<br><br><br><br>Bottom-most Steps<br><br>During normal operations, the logic does not step out of a simultaneous branch until all of the incoming legs have reached their bottom-most step. In the example shown, the logic does not step out of the Outer simultaneous branch until the left-most leg has stepped out of the Inner simultaneous branch.<br><br>The first time through the SFC routine, the application works as expected. On subsequent scans, however, the chart steps out of the Outer simultaneous branch even though the left leg has not reached the Inner simultaneous branch yet.<br><br>This behavior occurs because the information in the bottom step, that is, the step next to the word Outer, remains from the previous scan. This stale information incorrectly causes the transition to move on as if the left leg is at the bottom step when it actually is not.<br><br>To work around this anomaly, confirm all of the incoming legs have reached their bottom steps in the transition. You can check the .x bits to make sure the bottom-most step of each converging leg is active before allowing the chart to advance. This check can be added to the transition logic already present.<br><br>For example, the steps in the following expression are the bottom steps (see graphic above) of the incoming legs. Each step has a timer. The transition does not move on until all of the step timers have reached their preset value.<br><br>The expression can be modified to be sure those steps are truly active. This is the **original expression**:<br>    // Unit is ready to Transition<br>    Step1_ready.dn and Step2_ready.dn and Step3_ready.dn and Step4_ready.dn and Step5_ready.dn<br><br>This is the **modified expression** to workaround this anomaly.<br>    // Unit is ready to Transition<br>    Step1_ready.*x* and Step2_ready.*x* and Step3_ready.*x* and Step4_ready.*x* and Step5_ready.*x* and Step1_ready.dn and Step2_ready.dn and Step3_ready.dn and Step4_ready.dn and Step5_ready.dn<br><br>**IMPORTANT**: The *x* bit is cleared when the chart transitions out of a step.<br><br>Adding this check to the condition forces the engine to wait until all of those steps are genuinely active before advancing out of the simultaneous branch.<br><br>Lgx00118189, Lgx00116506 |

**Table 6 - Corrected Anomalies in Enhanced Redundancy System, Revision 20.055_kit1 (or earlier)  (Continued)**

| Cat. No./System Component | Enhanced Redundancy System Revision | Description |
|---|---|---|
| 1756-L61<br>1756-L62<br>1756-L63<br>1756-L63XT<br>1756-L64<br>1756-L65<br>1756-L71<br>1756-L72<br>1756-L73<br>1756-L73XT<br>1756-L74<br>1756-L75 | 20.054 | **CORRECTED**: Deleting a small rung, such as a rung with just an XIC and OTE, or a rung with a single instruction, such as NOP or RES, could cause a controller to experience a Major nonrecoverable fault.<div align="right">Lgx00124861</div> |
| | | **CORRECTED**: When an alarm instruction is being modified online while it is executing, it can cause the redundancy system to disqualify. The system recovers automatically at a later time.<div align="right">Lgx00117401</div> |
| | | **CORRECTED:** In some systems with a single periodic task, forced output drops upon redundancy switchover.<div align="right">Lgx00124234</div> |
| | | **CORRECTED:** In some systems where the first scan bit (S:FS) is being analyzed, the first system scans the first scan bit again on the first scan after a switchover.<div align="right">Lgx00126870</div> |
| 1756-CN2, 1756-CN2R,<br>1756-CN2RXT,<br>1756-EN2T,<br>1756-EN2TR,<br>1756-EN2TXT,<br>1756-RM, 1756-RMXT | | **CORRECTED:** After a switchover is completed, the primary redundancy module incorrectly reports a **Synchronized** status in RSLogix 5000 software, and primary ControlNet and Ethernet/IP communication modules report a **No Partner** status<br>After a successful switchover, these components in the enhanced redundancy system give these indications:<br><br>• Primary communication module is **PwNS**<br>• Secondary communication module is **DSNP**<br>• Synchronization Status tab in the RMCT shows **Synchronized**<br><br>These indications on the communication module and Synchronization Status tab incorrectly indicate that a switchover is complete but a redundancy state change is pending.<br>Typically, the components give these indications when the switchover is, in fact, complete and no state change is pending:<br><br>• Primary communication module is **PwDS**<br>• Secondary communication module is **CMPT**<br>• Synchronization Status tab in the RMCT shows **Disqualified**<br><br>To force the completion of the pending state change and re-synchronize the redundant chassis pair, cycle power to the secondary chassis.<div align="right">Lgx00115764</div> |
| RPI | | **CORRECTED:** In all prior releases for ControlLogix Redundancy, the RPI to an I/O module could not be set greater than 376 ms. This has been enhanced to allow any RPI acceptable for the module being configured.<div align="right">Lgx00105642</div> |
| RSLinx software | | **CORRECTED:** The following RSLinx software corrections have been made:<br>• Upgrading RSLinx software to version 2.59.00 or later, no longer stops the operation of the RMCT. If the RSLinx software version that you are upgrading to includes an older version of the RMCT than what is already installed, then the already-installed RMCT version is not affected. Alternatively, if the upgraded RSLinx version included a newer version of the RMCT, then the new RMCT version installs automatically on top of the already-installed RMCT version.<br>• The RMCT can be successfully installed without seeing any error messages after the uninstallation of RSLinx software, version 2.57.00 or later.<br>• With RSLinx software, version 2.57.00 or later, RSLinx software can be downgraded to an older version without any errors. For example, if you have the RMCT, version 7.02.07 installed while using RSLinx software, version 2.59.00, then you can uninstall RSLinx version 2.59.00 and successfully install RSLinx software, version 2.57.00. The RMCT, version 7.02.07, is not overwritten with the older version of the RMCT that is included in RSLinx software, version 2.57.00. To downgrade the RMCT version as well, manually uninstall and reinstall the desired RMCT version by using ADD/Remove Programs in the Control Panel.<div align="right">Lgx00086040</div> |
| 1756-RM, 1756-RMXT | | **CORRECTED:** Repeated connection and disconnection, or irregular insertion, of the 1756-RM or 1756-RMXT redundancy modules' fiber-optic cable results in various fault codes indicated on the module status display.<br>If the 1756-RM or 1756-RMXT redundancy modules' fiber-optic cable is disconnected and connected repeatedly within short periods of time, or the cable is inserted slowly at a slight angle to the connector, the redundancy module faults and indicates error codes such as E0xx or EAxx.<br>To avoid experiencing these faults, wait 5…10 seconds between disconnecting and connecting the 1756-RM or 1756-RMXT redundancy modules' fiber-optic cable and verify that the insertion is quick and straight into the connector.<div align="right">Lgx00084595, Lgx00113995, Lgx00113954, Lgx00116055</div> |

## Known Anomalies

This table lists the known anomalies applicable to the enhanced redundancy system, revision 20.055_kit5 (or earlier).

**Table 7 - Known Anomalies in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)**

| Cat. No. | Description |
|---|---|
| 1756-EN2T, 1756-EN2TR, 1756-EN2TXT | You cannot have kits with firmware revisions 10.006 and 10.007 installed on the same computer. If you have firmware revision 10.006 installed and you attempt to install firmware revision10.007, 10.007 generates an error directing to an incorrect .nvs file. Reinstall the desired firmware revision and ignore the error. We recommend using Firmware revision 10.007 because it has corrected anomalies from firmware revision 10.006.<br><br>Lgx00155450 |
| 1756-CN2, 1756-CN2R, 1756-CN2RXT, 1756-EN2T, 1756-EN2TR, 1756-EN2TXT, 1756-EN2F, 1756-RM, 1756-RMXT, 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | Multiple switchovers can cause connection failure to SoftLogix controllers.<br>When a high number of consumed connections are routed through a ControlNet communication module in the primary chassis to a SoftLogix controller, the primary controller reports a connection failure, that is, error code 16#0203.<br>This anomaly occurs despite the fact that there are no network disruptions or device power cycling.<br><br>Lgx00115516 |
| 1756-EN2T, 1756-EN2TR, 1756-EN2TXT, 1756-EN2F, 1756-L61, 1756-L62. 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | Connections can drop temporarily if a 1756-EN2T*x* communication module is not configured correctly.<br>If your application includes a connection from a remote controller to a primary controller over an EtherNet/IP network, you must use these configuration settings for the 1756-EN2T*x* communication module in the primary chassis when it is added to the **remote controller's** RSLogix 5000 project:<br>• Rack Connection = None<br>• Time Sync Connection = None<br>If the parameters are configured in any other combination, the connection between the remote controller and primary controller is temporarily dropped during a switchover. The connection is re-established after the switchover is complete.<br><br>**IMPORTANT** When you add the 1756-EN2T*x* communication module to the **primary controller's** RSLogix 5000 project, you can use any settings for the parameters above with no effect on the connection from remote controller to primary controller.<br><br>Lgx00111615, Lgx00108809, Lgx00109656 |
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | Redundant chassis synchronization fails when the controller is near its connection limit.<br>Chassis synchronization can 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.<br>• The 1756-L6*x* controllers support as many as 250 controller connections. If your enhanced redundancy system uses these controllers, limit the number of controllers connections used to 242 or fewer connections.<br>• The 1756-L7*x* controllers support as many as 500 controller connections. If your enhanced redundancy system uses these controllers, limit the number of controllers connections used to 492 or fewer connections.<br><br>Lgx00063311 |
| | Alarms scanned during the continuous task can be published to the alarm server twice after a switchover.<br>If a switchover occurs and a continuous task that contains alarm instructions is scanned twice as a result, a duplicate `out of scope' alarm entry can be indicated in the alarm summary object. To clear `out of scope' entries, click Refresh alarm list. |
| | Alarm status messages can be duplicated in the Alarm History Log in the event of a switchover.<br>To make troubleshooting duplicate alarm states easier, consider programming alarms to indicate when a redundant system switchover occurs. |
| | Alarms that are acknowledged just before or during a switchover can be indicated as active and unacknowledged after a switchover. If this occurs, acknowledge the alarm a second time. |
| | If an alarm is active, then inactive, and a switchover occurs before change in the alarm state is updated to the FactoryTalk server, the FactoryTalk alarm history log can not indicate the change in alarm state. |

**Table 7 - Known Anomalies in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)  (Continued)**

| Cat. No. | Description |
|---|---|
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | Alarm parameters can be lost when a switchover occurs. <br><br> When a switchover occurs in a redundant system that uses alarms, certain alarm parameters can not be transferred to the new primary controller if the parameters have changed since the last crossload of data. Alarm parameters that can not transfer include the following: <br><br> • DeliveryER <br> • DeliveryEN <br> • NoSubscriber <br> • NoConnection <br> • CommError <br> • AlarmBuffered <br> • SubscNotified <br><br> Once the alarm data is buffered, the parameters are updated. <br><br> Lgx00093529 |
| | Alarms can fail to be acknowledged when the attempt to acknowledge them occurs during a switchover. <br><br> If you attempt to acknowledge an alarm while a switchover occurs, a failure to acknowledge the alarm is indicated. Attempting to acknowledge the alarm a second time is successful. <br><br> Lgx00093826 |
| | A Partial Import Online to a primary controller over a ControlNet network can fail if a system switchover occurs while the PIO is still in process. <br><br> When the anomaly occurs and the PIO fails, you can see any of these errors: <br><br> • Failed to import file 'c\...\xxx.L5x <br>   Object already exists <br> • Failed to import file 'c\...\xxx.L5x <br>   Already in request mode/state <br> • CIP error: Problem with a semaphore <br> • Internal Object Identifier (IOI) destination unknown <br><br> After the switchover completes, restart the PIO with the redundant chassis pair disqualified or synchronized, and the PIO is complete. <br><br> Lgx00114044, Lgx00113005, Lgx00111045, Lgx00111230 |
| | Inhibiting equipment phase can cause disqualification. <br><br> If you inhibit an equipment phase, or a task that includes an equipment phase, in a primary controller, the secondary controller is disqualified. This disqualification results from program sequence mismatches between the primary and secondary controllers. <br><br> Lgx00062035 |
| | When you import a routine to an empty program in a synchronized enhanced redundancy system, disqualification can occur. <br><br> Lgx00108673 |
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | If tasks are not properly tuned and you execute a large PIO, the primary controller can experience a watchdog fault during the import because the Watchdog parameter is set too low. The fault causes a switchover. <br><br> When this anomaly occurs, however, once the secondary controller goes online, it shows incorrect data in its fault log. The incorrect data appears in the Task, Program, and Routine fields. <br><br> The fault log typically shows the following: <br><br> • Watchdog Fault (Type 06) <br> • Task watchdog expired. Can be caused by an infinite loop, a complex program, or a higher priority task. (Code 01) <br> • Task: <unknown> <br> • Program: <unknown> <br> • Routine: <unknown> <br><br> You must execute an upload on the secondary controller to obtain correct Task, Program, and Routine watchdog information in the event of a future watchdog fault. <br><br> Lgx00108575 |
| | When a program in the primary controller is inhibited or uninhibited, the secondary can disqualify and re-qualify. <br><br> 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. <br><br> Lgx00090432 |

**Table 7 - Known Anomalies in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)  (Continued)**

| Cat. No. | Description |
|---|---|
| 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | 1756-L7*x* controllers display No Project message during qualification process.<br><br>While qualification is in process in a system that uses 1756-L7*x* controllers, controllers in the secondary chassis display **No Project** in their Scrolling Status Display status indicator. When qualification is complete, the secondary controllers display the name of the project loaded into the primary controller.<br><br>Lgx00115228 |
| ControlNet network | If connecting a redundant controller over ControlNet by using the Controller Log feature, and a switchover occurs, the controller log entries no longer shows the user's name. After the switchover, the user name indicates 'unknown.'<br><br>Lgx00125445 |

# Restrictions

This table lists the restrictions applicable to the enhanced redundancy system, revision 20.055_kit5 (or earlier)

**Table 8 - Restrictions in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)**

| System Component | Description |
|---|---|
| 1756-EN2T/D | The 1756-EN2T module, series D, cannot be used for SIL2 applications as part of the safety loop. |
|  | For more information on configurations for SIL2 applications, refer to Using ControlLogix in SIL 2 Applications Reference Manual, publication 1756-RM001. |
| 1756-EN2T/D, 1756-EN2T/C, 1756-EN2TR | The existing 1756-EN2T/D module specification sheets do not list the modules as being SIL2 certified. Policies currently in place by TÜV require that only the 1756-EN2T/C or the 1756-EN2TR modules be used for SIL2 applications as part of the safety loop. |
| 1756-CN2, 1756-CN2R, 1756-CN2RXT, 1756-CN2RK | 1756-CN2/B and 1756-CN2R/B module firmware is not compatible with 1756-CN2/A and 1756-CN2R/A, hardware. You cannot flash series A or B firmware on series C hardware or vice versa. |
|  | The 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C module firmware is not compatible with series A and B hardware. |
|  | The 1756-CN2/B and 1756-CN2R/B module firmware is not compatible with the 1756-CN2/A or 1756-CN2R/A hardware. |
|  | Do not attempt to upgrade an 1756-CN2/A or 1756-CN2R/A, module with 1756-CN2/B or 1756-CN2R/B firmware. Attempting to do so results in ControlFlash software displaying a severe incompatibility warning. Series A modules are not supported in redundancy. |
|  | The 1756-CN2*x* communication modules provide a maximum of 128 CIP connections for standard (non redundancy) application use. |
|  | The 1756-CN2*x* communication modules provide 131 CIP connections. However, three of the 131 CIP connections are always reserved for redundant control. These three redundant-system CIP connections always appear to be in use, even when no connections are open. |
|  | Because three of the 131 CIP connections are reserved for redundancy, 128 CIP connections are available for nonredundant use. |
|  | When using the 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, and 1756-CN2RK/C communication modules, you must set the electronic keying option to Disable Keying or Compatible Match because Add-on profiles are not available for these modules. |
| 1756-EN2T | Do not use 1756-EN2T communication modules, firmware revision 1.004 or earlier, in redundant chassis. |
|  | 1756-EN2T communication module firmware revision 1.004 is not redundancy-compliant either in standard or enhanced redundancy systems. You must upgrade 1756-EN2T communication modules to firmware revision 5.008 to use this enhanced redundancy system revision. |
| 1756-EN2T, 1756-EN2TR, 1756-EN2TXT 1756-EN2F | The 1756-EN2*x* communication modules provide 259 CIP connections. However, three of the 259 CIP connections are always reserved for redundant control. These three redundant-system CIP connections always appear to be in use, even when no connections are open. |
|  | Because three of the 259 CIP connections are reserved for redundancy, 256 CIP connections are available for nonredundancy use. |
|  | You cannot use a 1756-EWEB communication module in an enhanced redundancy system, revision 20.054. |
|  | If you are migrating from a ControlLogix standard redundancy system to an enhanced redundancy system, you must replace existing 1756-EWEB communication modules with any of the 1756-EN2T*x* communication modules |
|  | Keep in mind that when you replace a 1756-EWEB communication module with a 1756-EN2T*x* communication module, your application loses functionality that is available with only the 1756-EWEB communication module. These are examples of functionality that is no longer available in an Enhanced Redundancy System: |
|  | • Simple Network Time Protocol (SNTP) Client |
|  | • Web pages |
|  | You must account for this lost functionality in your RSLogix 5000 software project. |
|  | **IMPORTANT**: You cannot perform online migration from 1756-EWEB communication modules to 1756-EN2T or 1756-EN2TR communication modules. |
|  | Lgx00092779 |
|  | The 1756-EN2T*x* communication modules do not support Immediate Output (IOT) instructions. |
|  | Because these modules do not support the IOT instruction, they cannot override the RPI in a remote chassis and immediately send new data over the EtherNet/IP network. |
| 1756-L75/A 1756-CN2R/B 1756-RM/B 1756-EN2T/C 1756-EN2TR/B 1756-EN2F | If a qualification fails due to a ControlNet scheduling issue ((29) Qualification Error - Failed Connection Duplication logged in the 1756-RM event logs), the system continuously attempts the qualification and fail. This continues to occur until the cause is addressed or the Auto-Qualification option is changed to Never. The visual symptom is a repetitive display sequence of QFNG/DISQ on the 1756-RM. |

**Table 8 - Restrictions in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)  (Continued)**

| System Component | Description |
|---|---|
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 1756-EN2T, 1756-EN2TR, 1756-EN2TXT 1756-EN2F | A redundant controller project cannot contain consumed Unicast connections. The project can contain produced Unicast tags consumed by remote consumers. |
| 1756-EN2T, 1756-EN2TR, 1756-EN2TXT, 1756-EN2F, 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74,1756-L75 | There are differences between CIP Sync technology in nonredundant systems and enhanced redundancy systems, revision 20.054. <br><br> **IMPORTANT** Before you use this enhancement in an enhanced redundancy system, see these publications for a full understanding of CIP Sync technology in any system: <br> • ControlLogix System User Manual, publication 1756-UM001 <br> • ControlLogix Controllers, Revision 18 Release Notes, publication 1756-RN018 <br> • Integrated Architecture and CIP Sync Configuration Application Technique, publication IA-AT003 <br><br> Consider the following when you use CIP Sync technology in an enhanced redundancy system, revision 20.054: <br><br> • If you enable CIP Sync Time Synchronization in the controllers in a redundant chassis pair, you must also enable Time Synchronization in the EtherNet/IP communication modules in the redundant chassis pair so all devices have a single path to the Grandmaster. <br> If time synchronization is enabled in any controller in the primary chassis of a disqualified Redundant Chassis Pair, and no other devices, that is, EtherNet/IP communication modules, in the primary chassis have time synchronization enabled, the redundant chassis pair attempts to qualify. However, in these application conditions, the attempt to qualify fails. <br><br> • While CIP Sync technology can handle multiple paths between master and slave clocks, it resolves mastership most effectively if you configure the redundant paths so that Time Synchronization is enabled in only the minimum required number of EtherNet/IP communication modules. <br> For example, if your redundant chassis pair has three 1756-EN2T communication modules and all are connected to the same network, enable Time Synchronization in only one of the modules. <br><br> • If the primary controller is the Grandmaster, the enhanced redundancy system automatically manages the CIP Sync clock attributes so that the controller in the primary chassis is always set to be the Grandmaster instead of the secondary controller. This clock management ensures a change to a new Grandmaster when the redundancy system switches over. <br><br> • When a switchover occurs, these events take place: <br> – The Grandmaster status transfers from the original primary controller to the new primary controller. This transfer can take longer to complete than if Grandmaster status was transferred between devices in a nonredundant system. <br> – The synchronization of the enhanced redundancy system can take longer to complete than when it occurs on a switchover in an enhanced redundancy system, revision 20.054, that does not use CIP Sync technology. <br><br> • If you attempt to use the Redundant System Update (RSU) feature to upgrade an enhanced redundancy system, revision 16.081 or earlier, that uses Coordinated System Time (CST), the enhanced redundancy system, revision 20.054 does not permit a locked switchover and the upgrade fails to complete. <br> To work around this restriction, first disable CST Mastership in the original redundancy system and then use RSU to upgrade to enhanced redundancy system, revision 20.054. |

**Table 8 - Restrictions in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)  (Continued)**

| System Component | Description |
|---|---|
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64, 1756-L65, 1756-L71, 1756-L72, 1756-L73, 1756-L73XT, 1756-L74, 1756-L75 | You can place a maximum of two controllers in the same chassis in a redundant chassis pair. When two controllers are used in the same chassis, they must be of the same product family. For example, you cannot place a 1756-L6*x* controller with a 1756-L7*x* controller in the same chassis. |
| | Do not use Match Project to Controller property with redundant controllers. |
| | 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. |
| | Firmware Supervisor |
| | You cannot use the Firmware Supervisor feature available in RSLogix 5000 software. |
| | Event Tasks |
| | You cannot use event tasks in a ControlLogix enhanced redundancy systems. When you enable redundancy, you must change event tasks to nonevent tasks or delete them from your project. |
| | SERCOS Motion or Integrated Motion on the EtherNet/IP Network |
| | You cannot use Motion in ControlLogix enhanced redundancy systems. A remote controller can contain motion instructions even if it is on the same network as a redundancy system. |
| | Under some error conditions, the 1756-RM module continually attempts to requalify the system while the error prevents it from being successful. This causes the redundancy module error log to fill with the same error condition. If the system is in this condition, the redundancy module display cycles between QFNG and DISQ. To stop this from happening, change the redundancy module synchronization trigger in the Redundancy Module Configuration Tool (RMCT) to Never, until the error condition is corrected. |
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT, 1756-L64 | Update controller firmware from boot firmware can cause major nonrecoverable fault. |
| | We recommend that you upgrade controller firmware in a nonredundant chassis. When you update these controllers from the boot firmware revisions listed to higher firmware revisions, execute the update with the controller in a nonredundant chassis or primary chassis. |

| Controller | Firmware Revision |
|---|---|
| 1756-L61, 1756-L62, 1756-L63, 1756-L63XT | 1.007 or earlier (boot firmware) |
| 1756-L64 | 1.010 or earlier (boot firmware) |

If you attempt the firmware update with the controller in a redundant chassis, a major nonrecoverable fault (MNRF) can occur. If the fault does occur, the controller remains in a faulted state until you attempt the firmware update again with the controller in a nonredundant chassis.

The label on the side of the controller indicates the series controller and the boot firmware revision.



Complete these steps to upgrade from the boot firmware revision.

1.  Install the controller in a nonredundant chassis.

2.  Update the controller firmware.

3.  Use the controller as necessary in the redundant chassis pair.

After you have updated the controller beyond the boot firmware revision, you can perform any additional controller updates in either nonredundant or redundant chassis.

**Table 8 - Restrictions in Enhanced Redundancy System, Revision 20.055_kit5 (or earlier)  (Continued)**

| System Component | Description |
|---|---|
| 1756-CN2, 1756-CN2R, 1756-CN2RXT, 1756-EN2T, 1756-EN2TR, 1756-EN2TXT 1756-EN2F | System Event Entry contains a module failure event when an enhanced communication module is inserted. The System Event History displays a `Module Failure' entry when you insert a 1756-CN2*x* communication module or a 1756-EN2*x* communication module in the chassis while the redundant chassis pair is synchronized. This is not indicative of any module failure; instead, it indicates that only an enhanced communication module was inserted in the chassis. |
| 1756-RM 1756-RMXT | Under rare conditions, inserting a redundancy module into a running system can cause the redundancy system to switchover or disqualify, and cause the other modules in that chassis to reset themselves. Inserting the module at an angle causes the anomaly. Make sure the module is inserted straight into the chassis without any side-to-side or top-to-bottom movement. |

# Application Notes

Consider these application notes when configuring, programming, and using your ControlLogix enhanced redundancy system revision 20.055_kit5.

## Add-on Profile Availability

Add-on Profiles (AOP) offer the most current device configuration options in RSLogix 5000 software. AOPs are available between software releases.

You can download AOPs from: https://download.rockwellautomation.com/esd/download.aspx?downloadid=addonprofiles

> **TIP**  You may need to click on the `>' symbol next to the `Custom Download Files' to expand the AOP list.
>
> Note: The version listed in the tables is the version of the AOP, not the version of the supported firmware.

You use the RSLogix 5000 Module Profiles Setup Wizard to install the AOP.

> **IMPORTANT**  AOPs are not available for the 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, and 1756-CN2RK/C communication modules.

Consider the following:

- If your RSLogix 5000 software version does not allow you to configure a device to exactly match the physical device, you must download and install the device's AOP.

For example, if your enhanced redundancy system includes a 1756-EN2T/D module and the software project requires the module be configured with Electronic Keying = Exact Match, you must install the AOP first.

| IMPORTANT | When using the 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C communication modules, you can use the settings Disable Keying or Compatible Match. |
|-----------|------|

- If you cannot download or install an AOP, we recommend that you use Electronic Keying = Compatible Module or Disable Keying until you can.

## Maintaining SIL2 Certified Systems

The existing 1756-EN2T/D module specification sheets do not list the modules as being SIL2 certified. Policies currently in place by TÜV require that only the 1756-EN2T/C or the 1756-EN2TR modules be used for SIL2 applications as part of the safety loop.

For more information on configurations for SIL2 applications, refer to Using ControlLogix in SIL 2 Applications Reference Manual, publication 1756-RM001.

## Out-of-box Switch (888) Behavior

With the 1756-EN2T/D modules, firmware 10.006 or later, the 1756-EN2TR/C modules, firmware revision 10.007, and the 1756-EN2F/C modules with firmware revision 10.009, when the switches are set to 888 to perform an out-of-box reset and the module is installed in a chassis, remember the following:

1   The module does not become active on the backplane.

2   Other modules do not recognize the module.

3   RSLinx Classic software does not recognize the module.

4   If the module is installed in the primary chassis of a qualified redundant chassis pair, a switchover does not occur. This item does not apply to 1756-EN2T/A/B/C, 1756-EN2TR/A/B, or 1756-EN2F/A/B modules.

## Performance Differences between Redundancy Module Series

You cannot mix 1756-RM2 or 1756-RM2XT redundancy modules with 1756-RM/B (or earlier) modules in a RCP. For example, you cannot use a 1756-RM module in the primary chassis and a 1756-RM2 module in the secondary chassis.

When you use a partnered set of 1756-RM2 modules in enhanced redundancy systems, revisions 20.054_kit1 (and later), the fiber channel between the modules can reach speeds as fast as 1000 Mbps.

You can use a mix of 1756-RM module series or 1756-RMXT module series in enhanced redundancy system, revision 20.054 (or later). You can also mix series of RM redundancy modules within a partnered set. For example, you can use a 1756-RM module in the primary chassis and a 1756-RM/B module in the secondary chassis.

> **TIP**    Your enhanced redundancy system experiences the best scan performance if it uses 1756-L7x controllers with 1756-RM2 modules in the RCP.

## Performance Difference with 1756-L65 Controller

With enhanced redundancy system, revision 20.054, the ControlLogix 1756-L65 controller's performance differs from that of the ControlLogix 1756-L64 controller.

For more information, see the ControlLogix Enhanced Redundancy System User Manual, publication [1756-UM535](#).

## EtherNet/IP Networks and Redundant Systems

Some connections to an enhanced redundancy chassis pair can briefly drop if the connection path between the device and the redundant chassis pair is made exclusively over an EtherNet/IP network.

For more information, see Communication Interruption on EtherNet/IP Networks on page 28.

### Produced/Consumed Tags between Primary Controllers and Nonredundant Controllers

If controllers in the redundant chassis pair produce tags over an EtherNet/IP network that controllers in remote chassis consume, the connection from the remote controller to the redundant controller can briefly drop during a switchover if the remote chassis' EtherNet/IP communication modules do not use specific firmware revisions.

Use these firmware revisions for EtherNet/IP communication modules in the remote chassis to maintain connections during a switchover.

**Table 9 - Minimum Firmware Revision for Communication Modules**

| EtherNet/IP Communication Module in Remote Chassis | Minimum Firmware Revision |
|---|---|
| 1756-EN2F | 5.008 (unsigned) 5.028 (signed) |
| 1756-EN2T | 4.002 |
| 1756-EN2TR | |
| 1756-EN3TR | |
| 1756-ENBT | 6.001 |
| 1768-ENBT | 4.001 |
| 1769-L2x | 19.011 |
| 1769-L3xE | |
| 1788-ENBT | 3.001 |

| IMPORTANT | The minimum firmware revisions listed above apply only to EtherNet/IP communication modules in the remote chassis. |
|---|---|
| | In a redundant chassis pair, you can use only the ControlLogix modules listed in Table 1. |

## Minimum Value for the Watchdog Time

To set Watchdog time for your 1756-L6x controllers, use this table to determine which equation to use to calculate the time for each task.

| If | Then use this equation |
|---|---|
| Using ControlNet I/O ms | $(2 * maximum\_scan\_time) + 150$ |
| Using Ethernet I/O ms | $(2 * maximum\_scan\_time) + 100$ |

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

To set the 1756-L7 initial task tuning, follow these steps.

> **IMPORTANT**    This works only when there is no Continuous task configured in the Logix application.

1. Monitor the Max Scan Time for each task while the redundant chassis pair is synchronized.

2. Set the Watchdog times for each task to 3 times the Max Scan Time.

3. Use the Logix5000™ Task Monitor Tool to configure each Task Period. [1]

- Adjust the Task periods of each so that the maximum scan time is less than 80% of the task period rate.



---

(1)    See the PlantPAx Automation System Reference Manual, publication PROCES-RM001.

- Adjust the Task periods so that the Logix CPU% utilization is never above 75%.
- While performing these tests, the HMI and any other external systems must be connected to the Logix controller.

> **IMPORTANT**    Verify that there are no task overlaps.

## 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.

## Different 1756-RM 2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware Revisions
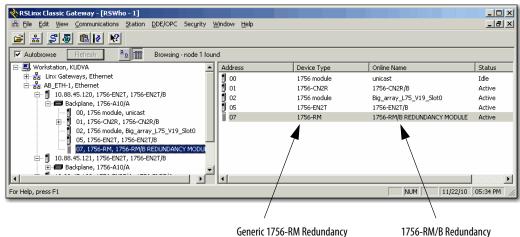
The firmware bundle available for enhanced redundancy system, revision 20.054_kit1 (or later), includes a new electronic data sheet (EDS) file for the 1756-RM2 modules and 1756-RM2XT modules. Enhanced redundancy system, revision 16.081, firmware bundle include an earlier, different EDS file for 1756-RM modules and 1756-RM2XT modules.

Failure to install the new EDS files available in enhanced redundancy system, revisions 20.054_kit1 (or later), firmware bundles prevents the use of RMCT, version 8.02.01.

If you use the EDS files available with enhanced redundancy system, revision 16.081 in an enhanced redundancy system, firmware revision 20.054, 1756-RM2/B modules and 1756-RM2XT/B modules, appears as series A modules in the Device Type column of an RSWho browse screen.

In this case, use the information in the Online Name column to identify your redundancy modules' series level. The information in the Online Name column is accurate.

We recommend that you use the EDS file for redundancy modules that is included with the enhanced redundancy system, revision 20.054_kit1 firmware bundle. With the new EDS file, the RSWho software Device Type column shows a generic 1756-RM device type, as shown in this graphic.



Generic 1756-RM Redundancy
Module Device Type

1756-RM/B Redundancy
Module Indication

## Communication Interruption on EtherNet/IP Networks

Brief communication interruption occurs if the connection between RSLinx Enterprise software and the redundant chassis pair uses a path exclusively over an EtherNet/IP network and a switchover occurs. After the switchover is complete, communication resumes automatically.

These connection types can experience the communication delay when a switchover occurs:

- HMI to redundant chassis pair

- FactoryTalk Batch server to redundant chassis pair

| IMPORTANT | The Batch Server detects the lost connection and repeatedly attempts to re-establish the connection until successful. However, while the connection is lost, the Batch Server puts the recipes, or entire batch, in the held state. |
|---|---|
| | After the connection between the Batch Server and the redundant chassis pair is re-established, you can clear the communication failure and restart the recipes. The Batch Server keeps the recipes in the held state until the failure is cleared and recipes restarted. |

- FactoryTalk Alarms and Events Service to redundant chassis pair

  If any alarms are generated while the connection is lost, that data is buffered. When the connection is re-established, you must acknowledge the connection loss.

If your application requires that the connections described above are maintained during a switchover, we recommend that the connection bridge between the component and a redundant chassis pair with an EtherNet/IP network to ControlNet network path.or exclusive ControlNet connection.

| IMPORTANT | I/O connections do not experience delays when a switchover occurs. |
|---|---|

*HMI Blind Time*

After a switchover, the time between the communication (updating active data) interruption and the restoration (resumes updates) is often referred to as 'HMI Blind Time.'

Beginning with revision 20.054, HMI blind time due to switchover has been reduced.

| **IMPORTANT** | RSLinx Enterprise software version 5.50.04 is required beginning with version 20.054. |
|---|---|

HMI blind time is dependent on several system variables. Variables that determine this length of time are as follows.

- Operating system
- Quantity and types of tags on scan in RSLinx Enterprise software
- Client screen update rates
- Number of program and controller scope tags in the redundant controller
- Controller loading that includes the following:
  - Number of tasks and scan rates (assumes no continuous task)
  - Memory usage
  - Null task percentage available
  - Network traffic

Based on testing with Windows Server 2003 software, 'HMI Blind Time' was reduced 40...80%. User results varies based on the variables listed above.

## Upgrade the RSLogix 5000 Software Version

This section describes how to upgrade your RSLogix 5000 software and, subsequently, the software project, when the following system conditions exist:

| | |
|---|---|
| **IMPORTANT** | Before you upgrade your RSLogix 5000 software version, consider the following:<br><br>• We **strongly recommend** that you read Rockwell Automation Knowledgebase Answer ID 565204 - RSLogix 5000 Software, Version 20.03, accessible at: http://www.rockwellautomation.com/knowledgebase/.<br>  A login is required to access the article.<br><br>• Upgrading the RSLogix 5000 software to version 20.03.00 is optional.<br>• If desired, you can continue to use RSLogix 5000 software version 20.01.00.<br>• You **cannot** install RSLogix 5000 software, **revision 20.01.00 and revision 20.03.00**, on the **same computer simultaneously**. |

• You are using enhanced redundancy system, revisions 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5.

• Your system is using RSLogix 5000 software and project, version 20.01.00.

• You want to upgrade RSLogix 5000 software to version 20.03.00.

• You can take the project offline, that is, the system is not required to continue to run during the software upgrade.

  If your system must continue to run during the software upgrade, you must use the Redundancy System Update option. This option is described on .

Complete the following steps to upgrade the RSLogix 5000 software version and project in your enhanced redundancy system.

| | |
|---|---|
| **IMPORTANT** | There are multiple methods available to upgrade the RSLogix 5000 software version in your enhanced redundancy system. The specific tasks required vary by system configuration and requirements.<br><br>This section describes one of the methods available.<br><br>For more information on upgrading your RSLogix 5000 software version, see Rockwell Automation Knowledgebase Answer ID 565204 referenced above. |

1. If your RSLogix 5000 project is online, go offline.

2. Update the computer to use RSLogix 5000 software, version 20.03.00.

3. Upload the project from the primary controller.

RSLogix converts the project to version 20.03.00 during the upload.

4. Save the project.

5. Download the new project to the controller.

**Replace a Module in the Secondary Chassis that has the Same Catalog Number and Firmware Revision**

These steps only apply when the primary chassis is at revision 20.055_kit5. These steps are used when performing a direct communication module replacement, for example, when replacing a communication module in the secondary chassis with a module that has the same:

- Catalog number
- Series
- Firmware (after updating the firmware, if necessary)

When you replace communication modules, make sure that the node address (for ControlNet modules), rotary switches, and Port Configuration (for Ethernet modules) match the existing modules.

1. Using the Redundancy Module Configuration Tool (RMCT):
   a. Set Auto-qualification to Never.
   b. Disqualify the redundant chassis pair (if not already disqualified).

2. Remove the module from the secondary chassis and replace it with the new module.

3. If applicable, update the module firmware by using ControlFLASH.

4. In the RMCT, from the Auto-Synchronization pull-down menu, choose your preferred method.



5. Manually synchronize the chassis, if needed.

# Replace 1756-EN2T, 1756-EN2TR, or 1756-EN2F Modules

This section describes how to replace ControlLogix EtherNet/IP communication modules in a ControlLogix enhanced redundancy system.

You can replace EtherNet/IP communication modules in this enhanced redundancy system as follows:

- Replace 1756-EN2T/C (or earlier) modules with 1756-EN2T/D modules.

- Replace 1756-EN2TR/B (or earlier) modules with 1756-EN2TR/C modules.

- Replace 1756-EN2F/B (or earlier) modules with 1756-EN2F/C modules.

If you want to replace the Ethernet communication module with the same catalog number and same firmware revision in the secondary chassis then see .

| **IMPORTANT** | The following section describes the requirements and tasks used to replace 1756-EN2T modules with 1756-EN2T/D modules. |
|---|---|
| | The same requirements and tasks apply when you replace 1756-EN2TR modules with 1756-EN2TR/C modules and when you replace 1756-EN2F/B (or earlier) modules with 1756-EN2F/C modules with the only differences being between specific catalog numbers and series levels. |
| | For example, before replacing 1756-EN2T modules, make sure you have installed the correct firmware on all 1756-EN2T/D modules. |
| | The same task applies when you replace 1756-EN2TR modules. That is, before you replace 1756-EN2TR modules, make sure you have installed the correct firmware on all 1756-EN2TR/C modules. |

You can replace the 1756-EN2T modules with 1756-EN2T/D by using the following methods:
- Synchronization and Switchover for the 1756-EN2T Modules - Use this method if the following conditions exist:
    - The module being replaced is a 1756-EN2T module in a system revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5 and Electronic Keying is not set to Exact match.

    For more information on this method, see .

- Upgrade the Firmware by Using Redundancy System Update - You must use this method if either of the following conditions exist:
    - You are upgrading for an enhanced redundancy system, revisions 19.052, 19.053, 19.053 Oct. 2011, 19.053_kit1, 20.054 Enh, or 20.054 Enh_kit1 to revision 20.055_kit5.

| **TIP** | Electronic Keying = Exact Match, Compatible Module, or Disable Keying. |
|---|---|

– The module being replaced is a 1756-EN2T module is in a system revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5 with Electronic Keying set to Exact Match. You must install the AOP described in <u>Add-on Profile Availability on page 21</u> for the 1756-EN2T/D module to use Exact Match.

For more information on this method, see <u>Upgrade the Firmware by Using Redundancy System Update on page 46</u>

---

**IMPORTANT**    Consider the following:

- Before replacing 1756-EN2T/C (or earlier) modules, make sure you have installed the correct firmware on all 1756-EN2T/D modules.
- When you upgrade 1756-EN2T/C (or earlier) modules to 1756-EN2T/D modules, you must do so in pairs. If not the system cannot synchronize after a switchover.
- Partnered pairs of 1756-EN2T modules must use the same values for the following parameters for IP address swapping to work in the system:
  – IP Addresses
  – Network Mask
  – Gateway address

---

## Synchronization and Switchover for the 1756-EN2T Modules

You can replace 1756-EN2T modules with 1756-EN2T/D modules without using the redundancy system update (RSU) feature if the module being replaced is a 1756-EN2T module in a system at revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5.

Complete these steps to replace 1756-EN2T modules with 1756-EN2T/D modules.

1.  Make sure the existing module and replacement module use the same IP, Network Mask, and Gateway addresses.

2.  If the Redundancy Module Configuration Tool (RMCT) is not at version 8.02.01, update to version 8.02.01.

3.  If you are using a 1756-RM2, upgrade the firmware to 20.005.

    See <u>About the Redundancy Module Configuration Tool on page 7</u> for instructions.

4.  In the RSLogix 5000 software, go online with the primary controller.
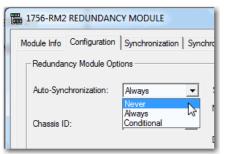
5. For each module, verify that the Electronic Keying is set to Compatible Module or Disable Keying.

6. In the RSLinx Classic software, start the RMCT for the 1756-RM module in the primary chassis.

7. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Never.

8. Click Apply.

9. On the Synchronization tab, click Disqualify Secondary.



10. Make a note of the secondary Ethernet module's Port Configuration.
    • IP Address
    • Network Mask
    • Gateway Address

11. Disconnect the Ethernet cables from the secondary Ethernet module.

12. Turn off power to the secondary chassis.

13. Remove the 1756-EN2T module from the secondary chassis.

14. Set the 1756-EN2T/D module switches to 888, insert the module in the secondary chassis, and turn on power on to the chassis.

    a. After the reset is complete, turn power off to the secondary chassis, remove the module from the secondary chassis.

    b. Set the switches to the same settings as on the EN2T that was removed.

    c. Reinsert the module into the secondary chassis, reattach the cable and Turn on power to the secondary chassis.

    d. Bridging across the backplane (or via the Ethernet module's USB port), configure the secondary Ethernet module's Port Configuration to match the Ethernet module's Port Configuration from <u>step 10 on page 36</u>.

    e. If you have not already updated the firmware of the 1756-EN2T/D, Update the module to firmware revision 10.007

15. Repeat steps <u>10</u>...<u>14</u> for all Ethernet modules in the secondary chassis.

16. Verify that the Synchronization Status tab indicates the modules are fully compatible.

**17.** On the Synchronization tab, synchronize the secondary chassis.



Wait for synchronization to complete.

**18.** Initiate a switchover.



**19.** Disconnect the Ethernet cables from the secondary Ethernet module.

**20.** Turn off power to the secondary chassis.

**21.** Remove the 1756-EN2T module from the secondary chassis.

**22.** Set the 1756-EN2T/D module switches to 888 and insert it in the secondary chassis and turn on power to the secondary chassis.

   **a.** After the reset is complete, turn power off to the secondary chassis, remove the module from the secondary chassis.

   **b.** Set the switches to the same settings as on the EN2T that was removed.

   **c.** Reinsert the module into the secondary chassis, reattach the cable and turn on power to the secondary chassis.

   **d.** Bridging across the backplane (or via the Ethernet module's USB port), configure the secondary Ethernet module's Port Configuration to match the Ethernet module's Port Configuration from step 10 on page 36.

   **e.** If you have not already updated the firmware of the 1756-EN2T/D, Update the module to firmware revision 10.007

**23.** Repeat the steps 19... 25 for all ethernet modules in secondary chassis.

24. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Always.



25. Click Apply, Yes, and OK.

26. Verify that the secondary chassis has qualified.

## Replace 1756-CN2 Modules

This section describes how to replace ControlLogix ControlNet communication modules in a ControlLogix enhanced redundancy system. You can replace ControlNet communication modules 1756-CN2/B, 1756-CN2R/B, and 1756-CN2RXT/B modules with 1756-CN2/C, 1756-CN2R/C, 1756-CN2RXT/C, or 1 756-CN2RK/C, modules.

> **IMPORTANT**  **ControlNet Communication Modules**
> – References to the 1756-CN2/B modules also apply to the 1756-CN2R/B, 1756-CN2RXT/B modules.
> – References to the 1756-CN2/C modules also apply to the 1756-CN2R/C, 1756-CN2RXT/C, 1756-CN2RK/C, modules.
> – Catalog numbers 1756-RM, 1756-RM2, and 1756-RM2XT refer to any series modules.

> **IMPORTANT**  The following section describes the requirements and tasks used to replace 1756-CN2 modules with 1756-CN2/C modules.
>
> The same requirements and tasks apply when you replace 1756-CN2R modules with 1756-CN2R/C modules with the only differences being between specific catalog numbers and series levels.
>
> For example, before replacing 1756-CN2/B modules, make sure you have installed the correct firmware on all 1756-CN2/C modules.

If you need to replace the ControlNet module with the same catalog number and same firmware revision in the secondary chassis, see .

You can replace the 1756-CN2/B modules with 1756-CN2/C by using the following methods:

- Synchronization and Switchover for the 1756-CN2/B Modules - Use this method if the following two conditions are met:
  - the module being replaced is a 1756-CN2/B module that is in a system at revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5.
  - if electronic keying is set to disable or compatible module

  For more information on this method, see .

- Upgrade the Firmware by Using Redundancy System Update - You **must** use this method if either of the following conditions are met:
  - you are upgrading an enhanced redundancy system, revisions 19.052, 19.053, 19.053 Oct. 2011, 19.053_kit1, 19.053_kit2, 20.054 Enh, or 20.054 Enh_kit1 to 20.055_kit4 or 20.055_kit5.
  - the module being replaced is a 1756-CN2/B module that is in a system at revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, 20.055_kit5 and the electronic keying set to exact match.

> **IMPORTANT**  When you upgrade 1756-CN2/B modules to 1756-CN2/C modules, you must do so in pairs. If not, the system cannot synchronize after a switchover.
>
> Replace 1756-CN2/B with 1756-CN2/C, and 1756-CN2RXT/B with 1756-CN2RXT/C modules.

## Synchronization and Switchover for the 1756-CN2/B Modules

You can replace 1756-CN2/B modules with 1756-CN2/C modules without using the redundancy system update (RSU) feature if the following conditions exist:

- The module being replaced is a 1756-CN2/B module that is in a system at revision 20.055_kit1, 20.055_kit2, 20.055_kit3, 20.055_kit4, or 20.055_kit5.

Complete these steps to replace 1756-CN2/B modules with 1756-CN2/C modules.

1. Add the EDS files for the Revision 25 1756-CN2/C modules, if you have not already done so.

2. Make sure the existing module and replacement module use the same ControlNet node address.

3. If the Redundancy Module Configuration Tool (RMCT) is not at version 8.02.01, update to version 8.02.01.

4. If you are using a 1756-RM2, upgrade the firmware to 20.005.

5. Using RSLogix 5000 software, go online with the primary controller.

6. For each 1756-CN2/B module, verify that Electronic Keying is set to Compatible Module or Disable Keying.

7. In the RSLinx Classic software, start the RMCT for the 1756-RM or 1756-RM2 module in the primary chassis.



a. Start RSLinx Classic Software.

b. Select Communications and choose RSWho.

c. Open the branches of your network until you find the 1756-RM or 1756-RM2 module in the primary chassis.

d. Right-click the 1756-RM or 1756-RM2 module, and choose Module Configuration.

8. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Never.



9. Click Apply and then Yes.

10. On the Synchronization tab, click Disqualify Secondary and then click Yes.



11. Turn off power to the secondary chassis.

12. Remove the 1756-CN2/B modules from the secondary chassis.

13. Make sure that the node addresses of the replacement ControlNet modules match the existing modules.

14. Insert each 1756-CN2/C module into the secondary chassis, reconnect the module to the network, and turn on power to the chassis.

15. If you have not already updated the firmware of the 1756-CN2/C modules, use the ControlFlash update tool to update the firmware of each 1756-CN2/C module in secondary chassis.

16. Verify that the Synchronization Status tab indicates the modules are fully compatible.



17. On the Synchronization tab, synchronize the secondary chassis.



Wait for synchronization to complete.

18. Initiate a switchover.



19. Turn off the power to secondary chassis and then remove the 1756-CN2/B modules from the secondary chassis.

20. Make sure to match the node address of replacing the ControlNet module with existing module.

21. Insert each 1756-CN2/C module into the secondary chassis, reconnect the module to the network, and turn on power to the chassis.

22. If you have not already updated the firmware of the 1756-CN2/C, modules, use ControlFLASH to update the firmware of each 1756-CN2/C module in secondary chassis.

23. In the RMCT, from the Auto-Synchronization pull-down menu, choose your preferred method.

Redundancy Module Options

Auto-Synchronization: Never ▼
Never
Always
Conditional

Chassis ID:

24. Manually synchronize the chassis, if needed.

Redundancy Commands

Synchronize Secondary

25. Click Apply, Yes, and OK.

26. Verify that the secondary chassis has qualified.

## Upgrade the RSLogix 5000 Software Version and Replace 1756-EN2T, 1756-EN2TR or 1756-CN2

This section describes how to upgrade your RSLogix 5000 software and, subsequently, the software project, and also replace ControlLogix EtherNet/IP or ControlNet communication modules in your enhanced redundancy system. when the following system conditions exist:

- You are using enhanced redundancy system, revision 20.055_kit5.

- Your system is using RSLogix 5000 software and project, version 20.01.00.

- You want to upgrade RSLogix 5000 software to version 20.03.00.

> **IMPORTANT** Before you upgrade the RSLogix 5000 software version on your computer, consider the following:
>
> - We **strongly recommend** that you read Rockwell Automation Knowledgebase Answer ID 565204 - RSLogix 5000 Software, Version 20.03, accessible at:
>   http://www.rockwellautomation.com/knowledgebase/.
>   A login is required to access the article.
> - Upgrading the RSLogix 5000 software to version 20.03.00 is optional.
> - If desired, you can continue to use RSLogix 5000 software version 20.01.00.
> - You **cannot** install RSLogix 5000 software, **revision 20.01.00 and revision 20.03.00**, on the **same computer simultaneously**.

- You want to perform one of the following module replacements:

  - Replace 1756-EN2T/C (or earlier) modules with 1756-EN2T/D modules
  - Replace 1756-EN2TR/B (or earlier) modules with 1756-EN2TR/C modules
  - Replace 1756-EN2F/B modules with 1756-EN2F/C modules
  - Replace 1756-CN2/B modules with 1756-CN2/C modules

Complete the following steps to upgrade the RSLogix 5000 software version and project in your enhanced redundancy system.

> **IMPORTANT** There are multiple methods available to upgrade the RSLogix 5000 software version in your enhanced redundancy system. The specific tasks required vary by system configuration and requirements.
>
> This section describes one of the methods available.
>
> For more information on upgrading your RSLogix 5000 software version, see Rockwell Automation Knowledgebase Answer ID 565204 referenced above.

1. If your RSLogix 5000 project is online, go offline.



2. Update the computer to use RSLogix 5000 software, version 20.03.00.

3. Upload the project from the primary controller.



4. Convert the project to version 20.03.00 and save it.

5. Download the new project to the controllers and resume normal operation.



6. Use one of the methods described in <u>Replace 1756-EN2T, 1756-EN2TR, or 1756-EN2F Modules on page 33</u>to replace the ControlLogix EtherNet/IP communication modules.

7. Use one of the methods described in <u>Replace 1756-CN2 Modules on page 39</u> to replace the ControlLogix ControlNet communication modules.

## Upgrade the Firmware by Using Redundancy System Update

You can upgrade an enhanced redundancy system revision to another while your process continues to run. This is known as Redundancy System Update (RSU).

| IMPORTANT | Remember the following before using this section: |
|-----------|---------------------------------------------------|
| | • RSU is available when upgrading only from an **enhanced** redundancy system revision to another. You cannot use this process to upgrade from a **standard** redundancy system to an enhanced redundancy system. |
| | • You can upgrade only from firmware revision 19.052 or later, to firmware revision 20.055. <br><br> Therefore, if you are not upgrading from ControlLogix enhanced redundancy system, revision 19.052 or later, ignore this section. |
| | • The term 1756-RM is synonymous with 1756-RM2 in the text and graphics throughout this section. |
| | • You must use this process if the following conditions exist: <br> – You are upgrading from an enhanced redundancy system, to revision 20.055_kit5. <br> – Your RSLogix 5000 software project requires EtherNet/IP modules to use Electronic Keying = Exact Match. <br> You must install the AOP described on <u>page 21</u> for the 1756-EN2T/D, 1756-EN2TR/C, or 1756-EN2F/C modules to use Exact Match. |

Complete the steps in this table to upgrade your redundancy system from one **enhanced** redundancy system revision to another **enhanced** redundancy revision while your process continues to run.

| Task | Page |
|------|------|
| Before You Begin | 47 |
| Upgrade the Workstation Software | 48 |
| Upgrade the Redundancy Module Configuration Tool | 48 |
| Verify Your RMCT Version | 49 |
| Add the EDS Files | 50 |
| Prepare the Redundant Chassis for the Firmware Upgrade | 50 |
| Update the Primary Chassis 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware | 52 |
| Upgrade the Secondary 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware and All Other Modules' Firmware in the Secondary Chassis | 53 |
| Prepare the RSLogix 5000 Project for the Upgrade | 58 |
| Lock the System and Initiate a Switchover to Upgrade | 60 |
| Upgrade the New Secondary Chassis Firmware | 62 |
| Synchronize the Redundant Chassis | 64 |

## Before You Begin

Consider these points before you begin upgrading your enhanced redundancy system to a new revision:

- During the upgrade procedures, you cannot use RSLogix 5000 software to change the mode of the controller. Instead, use the mode switch on the front of the controller.

- Leave RSNetWorx for ControlNet software closed or offline throughout this procedure. If the software is open or online, you see errors in the RSNetWorx for ControlNet software during the upgrade process.

- Remember the following when completing the tasks described in the rest of this section:
  - Do not make any changes to the RSLogix 5000 project other than those identified in these tasks.
  - Verify that no one is making changes to the project.
  - Do not use a FactoryTalk Batch Server to change equipment phase-states when upgrading your enhanced redundancy system.

## Download and Install the Redundancy Firmware Bundle

Download and install the redundancy firmware revision bundle from the Rockwell Automation Support website at:
http://www.rockwellautomation.com/support/

Follow these steps.

1. From the Get Support Now menu, click the Downloads link.
2. Under Additional Resources, click Firmware Updates.
3. Click Control Hardware.
4. Click the 1756-Lxx Enhanced Redundancy Bundle file.

   The Flash Firmware Updates window appears.

5. Enter your Serial Number.
6. Click Qualify For Update.
7. Click Finish when the Qualified For Update window appears.
8. Download the zipped file.
9. Install the Redundancy Firmware Bundle.

## Upgrade the Workstation Software

Before you download and upgrade software for 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.



Install the software required for your redundant system configuration. See Compatible Software Versions on page 6 for software versions required for use with this enhanced redundancy system revision.

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

## Upgrade the Redundancy Module Configuration Tool

The RMCT, version 8.02.01, is included in the enhanced redundancy system, revision 20.055_kit5 bundle. Once this bundle is installed, you can use the RMCT, version 8.02.01.
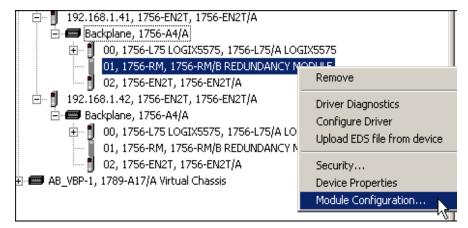
## Verify Your RMCT Version

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

1. Launch RSLinx Classic software.

2. Click the RSWho icon.
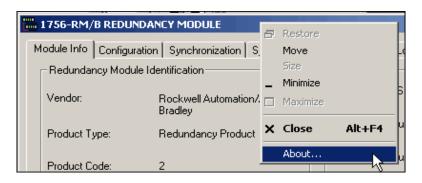


3. Right-click your redundancy module and choose Module Configuration.



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.



| | |
|---|---|
| **TIP** | The RMCT launches at the version that is compatible with the 1756-RM or 1756-RMXT redundancy module firmware that is currently installed. |
| | If you upgrade your RMCT version but do not upgrade your 1756-RM or 1756-RMXT redundancy module firmware revision compatible with the new RMCT version, the About dialog box can not reflect the new RMCT version. |

## Add the EDS Files

If needed, obtain EDS files for modules in your system from the Rockwell Automation website at:
http://www.rockwellautomation.com/resources/eds/.

1. Once you have downloaded the required EDS file, launch the EDS Hardware Configuration Tool.

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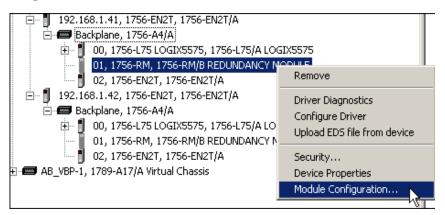
Complete these steps to prepare both the primary and secondary redundant chassis for redundancy firmware upgrades.

1. Set the mode switch of the primary and secondary controllers to REM.

   If the redundant controllers in both chassis of the redundant chassis pair 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 to open the RMCT.



**4.** Click the Configuration tab in the RMCT.

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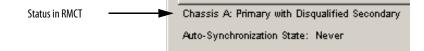


**6.** Click Apply, and then click Yes.

**7.** Click the Synchronization tab.



**8.** Click Disqualify Secondary, and then click Yes.

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

Status in RMCT →

> Chassis A: Primary with Disqualified Secondary
>
> Auto-Synchronization State: Never

**9.** Click OK and close the RMCT.
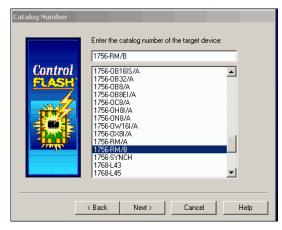
Closing the RMCT helps prevent a timeout from occurring when the redundancy module's firmware is upgraded.
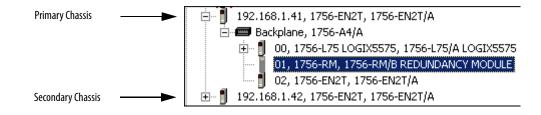
### Update the Primary Chassis 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware

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

Complete these steps to upgrade the firmware of the 1756-RM module in the primary chassis.

**1.** Launch ControlFLASH software and click Next.

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

3. Browse to the module and select it.



Primary Chassis

Secondary Chassis
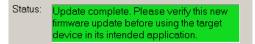
4. Click OK.

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

6. Click Finish.

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



## Upgrade the Secondary 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware and All Other Modules' Firmware in the Secondary Chassis

Power on the secondary chassis. Wait at least 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 in the secondary chassis.

1. Complete the following steps for each module in the secondary chassis, including a new controller, if applicable.

2. If you are replacing or upgrading your module hardware, remove the module from the secondary chassis and replace it with the new module.

| IMPORTANT | When replacing communications modules, make sure that the node address (for ControlNet modules), rotary switches, and Port Configuration (for Ethernet modules) match the existing modules. |
|---|---|

If you are replacing a controller, use this table to determine if your planned primary and secondary controllers can be used together in the redundant chassis.

**Table 10 - Controller Compatibility**

| Primary Controller | Compatible Secondary Controller |
|---|---|
| 1756-L61 | 1756-L61, 1756-L62, 1756-L63, 1756-L64, 1756-L65 |
| 1756-L62 | 1756-L62, 1756-L63, 1756-L64, 1756-L65 |
| 1756-L63 | 1756-L63, 1756-L64, 1756-L65 |
| 1756-L64 | 1756-L64, 1756-L65 |
| 1756-L65[(1)] | 1756-L65 |
| 1756-L71 | 1756-L71, 1756-L72, 1756-L73, 1756-L74, 1756-L75 |
| 1756-L72 | 1756-L72, 1756-L73, 1756-L74, 1756-L75 |
| 1756-L73 | 1756-L73, 1756-L74, 1756-L75 |
| 1756-L74 | 1756-L74, 1756-L75 |
| 1756-L75 | 1756-L75 |

(1)   In the ControlLogix enhanced redundancy system, revision 19.052, the ControlLogix 1756-L65 controller's performance differs from that of the ControlLogix 1756-L64 controller.

For more information, see the ControlLogix Enhanced Redundancy System User Manual, publication 1756-UM535.

> **IMPORTANT**   Controller compatibility is the same for the XT controllers as the standard controllers.

**3.** Consider these important steps in this table.

> **IMPORTANT**   • Continue with step 12 on page 55, if you are upgrading from a system using revision 19.052, 19.053, 19.053 Oct 2011, or 19.053_kit1, and you are either:
>   a. Updating 1756-EN2T/C (or earlier) modules with 1756-EN2T/C (or earlier) modules and the modules being replaced have rotary switches set to 2…254.
>   b. Replacing 1756-EN2T/C (or earlier) modules with EN2T/D modules, and the modules being replaced have rotary switches set to 2…254.

**4.** Launch ControlFLASH software and click Next.

**5.** Select the module catalog number and click Next.

**6.** Browse to the module and select it.



Primary Chassis → 192.168.1.41, 1756-EN2T, 1756-EN2T/A
Secondary Chassis → 192.168.1.42, 1756-EN2T, 1756-EN2T/A
  Backplane, 1756-A4/A
   00, 1756-L73 LOGIX5573, 1756-L73/A LOGIX5573
   01, 1756-RM, 1756-RM/B REDUNDANCY MODULE
   02, 1756-EN2T, 1756-EN2T/A

**7.** Click OK.

**8.** Select the firmware revision to upgrade to and click Next.

**9.** Click Finish.

The firmware begins to update. When the update 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.

**10.** Repeat <u>steps 2</u> …<u>9</u> for the next module in the chassis.

**11.** If this is the last module continue to <u>Prepare the RSLogix 5000 Project for the Upgrade on page 58</u>.

**12.** Make a note of the **primary** Ethernet module's Port Configuration including the following:
- IP Address
- Network Mask

- Gateway Address



13. Disconnect the Ethernet cables from the secondary Ethernet module.

14. If a 1756-EN2T/D module is the replacement module, then set the 1756-EN2T/D module switches to 888 and insert it in the secondary chassis.

15. After the reset is complete, remove the module from the secondary chassis.

16. If a 1756-EN2T/C module is being updated, remove the 1756-EN2T/C from the secondary chassis.

17. Set the switches to 999 and reinsert the module into the secondary chassis.

18. Bridging across the backplane (or via the Ethernet module's USB port), configure the **secondary** Ethernet module's Port Configuration to match the **primary** Ethernet module's Port Configuration from  step 12.
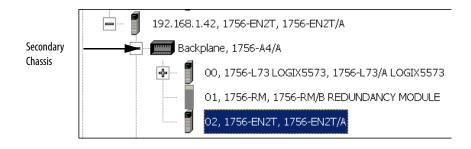
19. Confirm the **secondary** 1756-EN2T/D module is at firmware revision 10.007 or that the EN2T/C (or earlier) module is at firmware version 5.008.

   If necessary, complete the following steps to update module firmware.

   a. Launch ControlFLASH software and click Next.

   b. Select the Ethernet module catalog number and click Next.
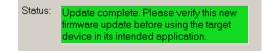


   c. Browse to the module and select it.



   d. Click OK.

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

   f. Click Finish.

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



   Wait for the update to complete.

20. After the update completes, connect the Ethernet cable to the secondary Ethernet module, and wait for communication to resume on the network.

21. Check the Synchronization tab in the RMCT to verify that compatibility is Full for all communication modules in the chassis.



22. Repeat [steps 2](...)...[21](...) for the next module in the chassis.

Once you have either replaced or upgraded the firmware for each module in the secondary chassis, prepare 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 software and go online with the primary controller.

2. Verify that the watchdog time is set to a value that corresponds with the requirements of the enhanced redundancy system revision and your application.
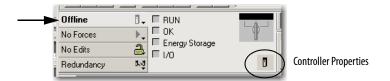
   See Minimum Value for the Watchdog Time on page 25 for information about calculating the minimum watchdog time.

3. Cancel or assemble any pending test edits.

4. Remove all Sequential Function Chart (SFC) forces from the project.

5. Verify that no changes need to be made to the following:
   – I/O forces
   – I/O configuration

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

6. Configure the controllers and communication modules in the redundant chassis pair as necessary.

7. Save the project.

8.  Go offline.



Controller Properties

9.  Click Controller Properties.

10. Click Change Controller.



11. Specify the controller revision you are upgrading to.

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

13. Click OK.

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



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

**15.** Save the project.

**16.** Download the project to the secondary controller.

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



**17.** After the download is complete, go offline.
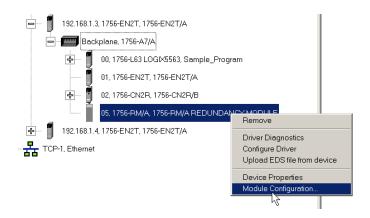
You are now ready to lock the system and initiate a locked switchover to update the primary chassis. Continue with <u>Lock the System and Initiate a Switchover to Upgrade</u>.

## Lock the System and Initiate a Switchover to Upgrade

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 can result in SFC instructions executing twice. |

**1.** In RSLinx Classic software, right-click the 1756-RM or 1756-RMXT redundancy module in the primary chassis and choose Module Configuration to open the RMCT.

2. Click the System Update tab.

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

System Update Commands

Lock For Update    Abort System Lock    Initiate Locked Switchover

3. Click Lock For Update, and then click Yes.

4. Wait for the system to lock.

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

System Update Lock Attempts

| 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 | — |
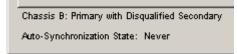
5. Click Initiate Locked Switchover, and then click Yes.

Initiate Locked Switchover

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.

Locked Switchover Attempts

| 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 text in chassis status row indicates the switchover state.

Chassis B: Primary with Disqualified Secondary

Auto-Synchronization State: Never

Once your locked switchover is complete, upgrade the firmware revisions for modules in the new secondary chassis.
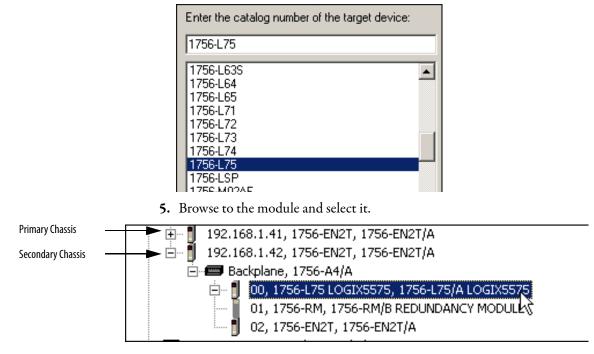
| IMPORTANT | Following the locked switchover, secondary controllers no longer contain a user application and their configuration settings are reset to the factory-default settings. |
| --- | --- |
| | The new secondary controllers use the default settings and the components in the secondary chassis are upgraded and the system is synchronized. |

## Upgrade the New Secondary Chassis Firmware

| IMPORTANT | Update the Gateway address of the primary chassis ethernet module to 192.168.1.1, if you are upgrading from a system using revision 19.052, 19.053, 19.053 Oct 2011, or 19.053_kit1, and Electronic Keying is set to Exact Match, Compatible Module or Disable Keying and you are either: |
| --- | --- |
| | a. Updating 1756-EN2T/C (or earlier) modules with 1756-E2N2T/C (or earlier) modules, and the modules being replaced have rotary switches set to 2...254. |
| | b. Replacing 1756-EN2T/C (or earlier) modules with EN2T/D modules, and the modules being replaced have rotary switches set to 2...254. |

Complete these steps to upgrade the firmware of all of the modules in the new secondary chassis, except for the 1756-RM or 1756-RMXT redundancy module that was already upgraded as described in <u>Update the Primary Chassis 1756-RM2, 1756-RM2XT, 1756-RM, or 1756-RMXT Redundancy Module Firmware on page 52</u>.
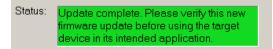
1. If you are replacing and upgrading your module hardware, remove the module from the secondary chassis and replace it with the new module.

   | TIP | When replacing communications modules, make sure that the node address (for Control net modules), rotary switches, and Port Configuration (for Ethernet modules) match the existing modules. |
   | --- | --- |

2. If it is an Ethernet module:
   a. Make a note of the rotary switch setting on the modules that you are replacing.
   b. Set rotary switches on the replacement module to 888 and insert the module into the chassis.
   c. After reset completed, remove the module.
   d. Set the rotary switches to original values that you noted in step a.
   e. Insert the module.
   f. Go into the module properties and restore the values that you noted in <u>step 12 on page 55</u>.

3. Launch ControlFLASH software and click Next.

4.  Select the module catalog number and click Next.

> Enter the catalog number of the target device:
>
> 1756-L75
>
> 1756-L63S
> 1756-L64
> 1756-L65
> 1756-L71
> 1756-L72
> 1756-L73
> 1756-L74
> **1756-L75**
> 1756-LSP
> 1756-M02AF

5.  Browse to the module and select it.

Primary Chassis ⟶   ⊞ 192.168.1.41, 1756-EN2T, 1756-EN2T/A

Secondary Chassis ⟶   ⊟ 192.168.1.42, 1756-EN2T, 1756-EN2T/A
    ⊟ Backplane, 1756-A4/A
        ⊟ **00, 1756-L75 LOGIX5575, 1756-L75/A LOGIX5575**
            01, 1756-RM, 1756-RM/B REDUNDANCY MODULE
            02, 1756-EN2T, 1756-EN2T/A

6.  Click OK.

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

8.  Click Finish.

    The firmware begins to update. When the updated 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.
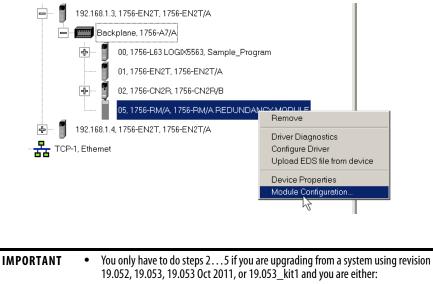
9.  Complete steps 1 …8 for each module in the new secondary chassis, including the new controllers, if applicable.

Once you have either replaced or 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 have been upgraded to the same revision.

1. In RSLinx software, right-click the 1756-RM or 1756-RMXT module in the primary chassis and choose Module Configuration to open the RMCT.



> **IMPORTANT**
> - You only have to do steps 2…5 if you are upgrading from a system using revision 19.052, 19.053, 19.053 Oct 2011, or 19.053_kit1 and you are either:
>   a. Updating 1756-EN2T/C (or earlier) modules with 1756-EN2T/C (or earlier) modules, and the modules being replaced have rotary switches set to 2…254.
>   b. Replacing 1756-EN2T/C (or earlier) modules with EN2T/D modules, and the modules being replaced have rotary switches set to 2…254.

2. On the Synchronization tab, synchronize the secondary chassis.



Wait for synchronization to complete.

Steps 3…7 are only applicable if the ethernet switches are set between 2…254.

3. Initiate a switchover.



4. In the new secondary, set the rotary switches back to the original configuration.

5. Repeat this for all Ethernet modules that need the rotary switches set back to 2...254.

6. From the Auto-Synchronization pull-down menu, choose the frequency that suits your application.



7. Manually synchronize the chassis, if needed.



8. Set the redundancy module date and time according to your preference.

9. Click OK.

10. Close the RMCT.

Your redundant system firmware upgrade is now complete.

## Update IP Address Set Via Software to Address Set Via Rotary Switches
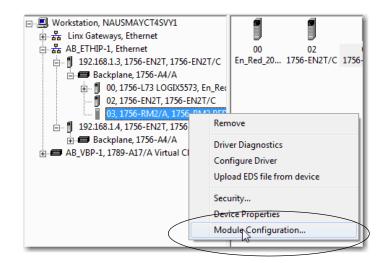
This section describes how to change Ethernet IP address settings set by software to IP addresses set by rotary switches when your system must continue to operate during the update.

One reason to change IP address settings to the rotary switch option is if you system is experiencing a Duplicate IP address condition and IP address swapping is disabled.

| IMPORTANT | Remember the following before using this section: |
|---|---|
| | • If you are replacing 1756-EN2T/C (or earlier) modules, firmware revision 5.008 (or later), ignore this section. |
| | • If you are replacing 1756-EN2T/D modules, ignore this section. |
| | • You must execute this procedure before the Redundancy System Update procedure. |
| | • **You must physically be present** at the location of the redundant chassis to do this upgrade. |
| | • You can upgrade only from firmware revision 19.052 or later, to firmware revision 20.055.<br>Therefore, if you are not upgrading from ControlLogix enhanced redundancy system, revision 19.052 or later, ignore this section. |
| | • The term 1756-RM is synonymous with 1756-RM2 in the text and graphics throughout this section. |

Complete the following steps.

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

2. Right-click the redundancy module in the primary chassis and choose Module Configuration.
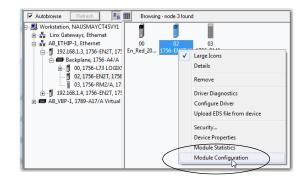
**3.** Verify that the chassis are synchronized.

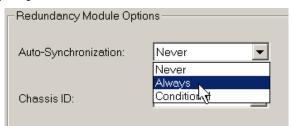**4.** On the Configuration, choose Never from the Auto-Synchronization pull-down menu.



**5.** Click Apply, and then click Yes.

**6.** Remove the secondary 1756-EN2T module from its chassis and disconnect the Ethernet cables from the module.

**7.** Configure the IP address on the primary 1756-EN2T module.

The following steps use RSLinx Classic software.

   **a.** Right-click the module icon and choose Module Configuration.

**b.** On the Port Configuration tab, enter the desired IP address, Network Mask (if not entered automatically), and click OK.

This example uses the values in the following screen capture.



**8.** Set the rotary switches on the removed secondary module to 888.

**9.** Reinstall the module into the secondary chassis.

| IMPORTANT | Make sure the module is not physically connected to the network before reinstalling it. |
|---|---|

**10.** After the module resets, remove it again.

**11.** Set the rotary switches on the secondary module to the desired IP address.

**12.** Reinstall the module in the chassis and reconnect it to the network.

Any Duplicate IP address errors that existed previously are no longer present.

**13.** On the Synchronization tab in the RMCT, click Synchronize Secondary to synchronize the chassis.

14. On the same tab, click Initiate Switchover to switch the primary and secondary chassis in the system.



15. Remove the new secondary 1756-EN2T module from its chassis and disconnect the Ethernet cables from the module.

16. Set the rotary switches on the removed secondary module to 888.

17. Reinstall the module into the secondary chassis.

> **IMPORTANT**     Make sure the module is not physically connected to the network before reinstalling it.

18. After the module resets, remove it again.

19. Set the rotary switches on the secondary module to the desired IP address.

20. Reinstall the module in the chassis and reconnect it to the network.

    Any Duplicate IP address errors that existed previously are no longer present.

21. In the RMCT, from the Auto-Synchronization pull-down menu, choose your preferred method.



22. Verify that the chassis are synchronized.Manually synchronize the chassis, if needed.



23. Click Apply, and then click Yes.

## Replace 1756-RM/B (or earlier) Modules with 1756-RM2 Modules

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

> **TIP**   For the following steps, `redundancy modules' refers to 1756-RM or 1756-RM/B modules.

Before executing these steps, review [Table 1](#)and [Table 2](#).

- [Required Series and Firmware Revisions for Components Used in an Enhanced Redundancy System, Revision 20.055_kit5 on page 3](#)
- [Required Software Versions for Enhanced Redundancy System, Revision 20.055_kit5 on page 6](#).

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. Disqualify the redundant chassis pair (if not already disqualified) by using the RMCT.

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 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 module.

   If needed, obtain the EDS file for the 1756-RM2 module. Right-click the module in RSWho and choose 'Upload EDS file from device'.

9. Update the primary and secondary 1756-RM2 modules to the to the appropriate firmware revision.

10. Reconnect the fiber cable on either CH1 or CH2 of the 1756-RM2 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 modules.

14. On the RMCT Configuration tab, from the Auto Synchronization pull-down menu, choose your original value.

15. Synchronize the system again (if it is not already qualified) by using the RMCT.

## Storing a Project to a Nonvolatile Memory Card While Your Process Is Running

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

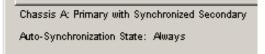| IMPORTANT | The ControlLogix controllers use these nonvolatile memory cards. |
|-----------|------------------------------------------------------------------|

| Cat. No. | Nonvolatile Memory Card |
|----------|-------------------------|
| 1756-L6x | 1784-CF64 or 1784-CF128 CompactFlash cards |
| 1756-L7x | 1784-SD1 or 1784-SD2 Secure Digital cards |

This section describes how to store a project to a nonvolatile memory card in a secondary controller without interrupting your process.

| IMPORTANT | We recommend that you store the same project on both controllers' nonvolatile memory cards. By doing so, you can be assured that if a controller, primary or secondary, loses the project from its internal memory, you can load the most recent project back onto that controller. |
|-----------|---|
| | If you store the same project on both controllers' nonvolatile memory cards, while the process is running, you must save the project on the controllers while they are in the secondary controller state. To do so, you save the project on the secondary controller, conduct a switchover and save the project on the new secondary controller. |
| | For more information, see the steps below. |

Complete these steps to store the project to the nonvolatile memory card on a secondary controller.

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.

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

    

4.  Click Apply, and then click Yes.

5. On the Synchronization tab, click Disqualify Secondary.



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



7. 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.

8. In the RMCT, from the Auto-Synchronization pull-down menu, choose your preferred method.
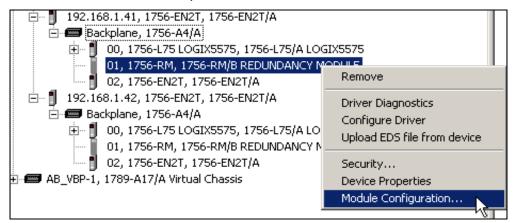


9. Depending on your Auto-Synchronization setting, manually synchronize the chassis if needed.



   If you do not need to store the project to the nonvolatile memory card in the primary controller, you are done.

10. If you want to store the project to the primary controller's nonvolatile memory card, execute a switchover as described in these steps.

a. In RSLinx Classic software, right-click the 1756-RM module and choose Module Configuration to open the RMCT for the **primary** redundancy module.
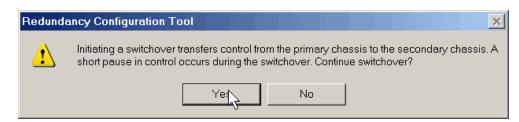


b. Click the Synchronization tab.

c. Click Initiate Switchover.



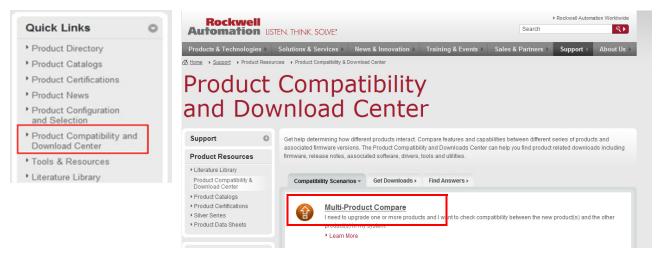The Redundancy Configuration Tool dialog box opens.

**11.** Click Yes.



The switchover begins. When the switchover is complete, the previously primary controller is now the secondary controller.

**12.** Return to to store the project on the new secondary controller.

## Access Product Release Notes

Product release notes for the products used with this enhanced redundancy firmware bundle are available online within the Product Compatibility and Download Center.

1. From the Quick Links list on http://www.ab.com, choose Product Compatibility and Download Center.



2. From the Compatibility Scenarios tab or the Get Downloads tab, search for and choose your product.



3. Click the download icon  to access product release notes.

## Additional Resources

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

| Resource | Description |
|---|---|
| ControlLogix Enhanced Redundancy System User Manual, publication 1756-UM535 | Provides design, installation, and troubleshooting information specific to the enhanced redundancy system. |
| FactoryTalk Batch PhaseManager™ User's Guide, publication BATCHX-UM010 | Provides instruction for PhaseManager, FactoryTalk Batch, and RSLogix 5000 software to develop a batch automation system by using phase logic for Logix5000 controllers. |
| PhaseManager User Manual, publication LOGIX-UM001 | Provides details about PhaseManager software and includes details about tags associated with the PHASE data type. |
| 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://www.ab.com | Provides declarations of conformity, certificates, and other certification details. |
| Rockwell Automation Technical Support Knowledgebase, available at http://www.rockwellautomation.com/knowledgebase/ | Provides details about how to assemble and mount the controller, how to upgrade firmware, and controller technical specifications. |

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

# 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 and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

## 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/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative. |

## New Product Satisfaction Return

Rockwell Automation tests all of its products to help 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/.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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