



# ControlLogix 5570 Redundancy Update and Module Replacement Guidelines



***Allen-Bradley***

by ROCKWELL AUTOMATION

Reference Manual

Original Instructions

## Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

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**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

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**IMPORTANT** Identifies information that is critical for successful application and understanding of the product.

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Labels may also be on or inside the equipment to provide specific precautions.



**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

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**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

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**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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## Summary of Changes

This table contains the changes that were made to this revision.

| Topic   | Page       |
|---|------------|
| Added information for redundancy firmware revision 33.051_kit2. | Throughout |

## Overview

This publication provides instructions for replacing modules or updating firmware in a powered-up and running enhanced redundancy system.

The following requirements must be met to use this publication:

- Online updates are only permitted for updates from revision 20.054 or later.
- The redundancy system is being updated to redundancy revision 24.052\_kit1 or later.
- If doing online updates of a running system, you must go in the following revision order: V20.05x > V24.053\_kit1 > V30.051\_kit1 > V31.052\_kit1 > V32.051\_kit1 > V33.051\_kit1
- Online updates are only permitted with a ControlLogix® 5570 controller (in both the previous release and the new release, in both the primary and secondary chassis).
- A replacement ControlLogix 5570 controller must have memory equal to or greater than the memory in the original ControlLogix 5570 controller.

You can access release notes for each redundancy firmware revision from the Rockwell Automation [Product Compatibility and Download Center](#) (PCDC).

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### IMPORTANT Restrictions with Online Updates:

- If a system is at 20.058\_kit1 or 20.058\_kit2, **it is not possible** to update to 24.052\_kit1. You can update to 24.053\_kit1.
  - If a system is at 30.051\_kit2, and uses Ethernet modules with firmware revision 11.003 or ControlNet® modules with firmware revision 25.006, **it is not possible to update** to 31.052\_kit1 or 31.052\_kit2.
  - If a system is at 31.052\_kit2, and uses Ethernet modules with firmware revision 11.002, **it is not possible** to update to 32.051\_kit1.
- 

In a redundant system, modules can be replaced, and firmware can be updated using either of the following methods:

- **Method 1:** Modules are replaced and firmware is updated while the redundancy system is powered up and the controllers are left in RUN mode. In this case, this publication applies.
- **Method 2:** If you power down the redundancy system or take controllers out of RUN mode to replace modules, then this method is similar to a new installation and this publication does not apply. Instead, see the ControlLogix 5570/5560 Redundancy User Manual, publication [1756-UM535](#), and install the modules, firmware, and application software versions for the appropriate revision for your installation. Compatible module firmware revisions and software versions are listed in the Release Notes for the appropriate redundancy firmware revision.

For instructions on how to update to revisions previous to 24.052\_kit1, see the appropriate release notes on the [Product Compatibility and Download Center](#).

## Modernization Services and Tools

Throughout the product lifecycle, as products mature, Rockwell Automation is there as your partner to help you get the most out of your current equipment. Rockwell Automation also helps you determine your next steps and lay out a plan for the transition to newer technology.

Rockwell Automation has the tools and the experience to guide you through the transition, whether you choose to modernize all at once or use our unique, phased approach.

For more information, see the modernization Solutions Brochure, publication [MIGRAT-BR002](#).

For tools that assist with planning and configuring an Integrated Architecture® system, see the Rockwell Automation [Product Selection and Configuration](#) website.

## Additional Resources

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

| Resource   | Description   |
|--|---|
| 1756 ControlLogix Controllers Specifications Technical Data, publication <a href="#">1756-TD001</a>      | Technical specifications for ControlLogix® controllers and accessories, including redundancy modules. |
| ControlLogix 5570/5560 Redundancy User Manual, publication <a href="#">1756-UM535</a>                    | Provides information to install, configure, and use redundancy systems.                               |
| ControlFLASH Firmware Upgrade Kit User Manual, publication <a href="#">1756-UM105</a>                    | Provides information on ControlFLASH™ software.   |
| ControlFLASH Plus Quick Start Guide, publication <a href="#">CFP-QS001</a>                               | Provides information on ControlFLASH Plus™ software.  |
| Modernization Solutions Brochure, publication <a href="#">MIGRAT-BR002</a>                               | Provides information about modernization.   |
| Integrated Architecture Tools and Resources website, <a href="#">Product Selection and Configuration</a> | Provides Integrated Architecture® tools and information.  |
| Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>              | General guidelines for installing a Rockwell Automation industrial system.                            |
| Product Certifications website, <a href="#">rok.auto/certifications</a> .                                | Provides declarations of conformity, certificates, and other certification details.                   |

You can view or download publications at [rok.auto/literature](#).

## Update Considerations

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### Before You Begin

When updating products in a ControlLogix® redundancy system, you must:

- Download and install the appropriate redundancy firmware bundle, and the compatible versions of the Studio 5000 Logix Designer® application, RSLinx® Classic, ControlFLASH™ or ControlFLASH Plus™ software, and the Redundancy Module Configuration Tool (RMCT).

- 
- IMPORTANT**
- For redundancy bundles that use firmware revision 20.009 or later for 1756-RM2 modules, the RMCT is included in the redundancy bundle and is not available as an individual download.
  - For redundancy bundles that use firmware revision earlier than 20.009, you download the RMCT separately as a product add-on.
  - In either case above, a separate install is required.

- 
- Update the firmware on the redundancy modules, controllers, and communication modules in the redundancy chassis pair.
  - Update the revision of controller and communication module firmware in the redundancy application project.

- 
- IMPORTANT** If you are migrating from an existing revision 30.051 redundancy application, use Studio 5000 Logix Designer application version 30.01.00 or newer. Version 30.00.00 has a known anomaly that sometimes prevents you from uploading redundancy projects to a new file, which can interfere with the update process. For more information see Knowledgebase Article [Studio 5000: Anomalies Corrected in Version 30.01](#).
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## LINT Members Must Align on 8-byte Boundaries

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**IMPORTANT** If you have User-defined Data Types (UDT) that contain LINT members, you may not be able perform the online Redundancy System Update. See the ControlLogix 5570/5560 Redundancy User Manual, publication [1756-UM535](#), on how to install and update the modules, firmware, and application software versions while offline.

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Beginning with version 27 of the Studio 5000 Logix Designer application, LINT members must be aligned on 8-byte boundaries, and User-defined Data Types (UDT) that contain LINT members must be sized as a multiple of 8 bytes.

This change impacts your Logix Designer application project if any of the following situations are true:

- You migrate a standard project, version 26 or earlier, to a redundancy project that is version 30.051 or later, and you have LINT tags inside a UDT.
- You migrate a redundancy project, version 24.053 or earlier, to a project that is version 30.051 or later, and you have LINT tags inside a UDT.
- You use a tag with LINT members as a producer, and at least one consumer (controller) has firmware earlier than version 27.
- You use a tag with LINT members as a consumer, and the producer (controller) has firmware earlier than version 27.

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**IMPORTANT** If you attempt to perform a Redundancy System Update from version 24.05x to version 30.051 or later, and you have LINT tags inside a UDT, the Lock for Update attempt can fail.

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For more information, see these resources:

- [Align LINT Members on 8-byte Boundaries on page 51](#)
- Logix Designer application online help topic: 'LINT data types within this tag now align on 8-byte boundaries. Check produce/consume connection'.



## Verify Your RMCT Version

**IMPORTANT** If you have RMCT version 7 or earlier, it does not support the 1756-RM2 modules. For more information on the RMCT, see Knowledgebase Article [Redundancy Module Configuration Tool \(RMCT\)](#).

**IMPORTANT** You must uninstall any existing version of the Redundancy Module Configuration Tool (RMCT) before you install the RMCT, version 8.4.1.0 or later. If you do not uninstall the previous version, you can have difficulty if you try to uninstall version 8.4.1.0 or later at another time.

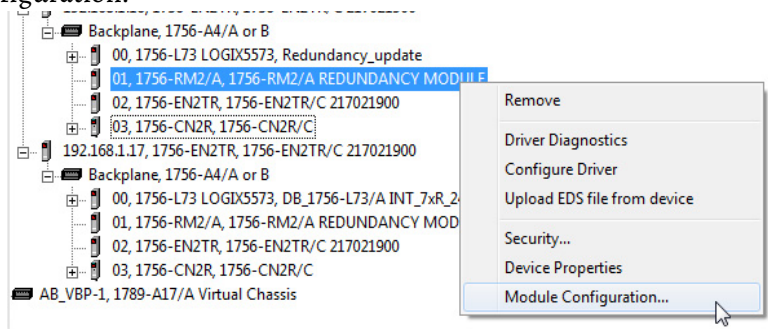
Complete these steps to check or verify the version of the RMCT you have installed.

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



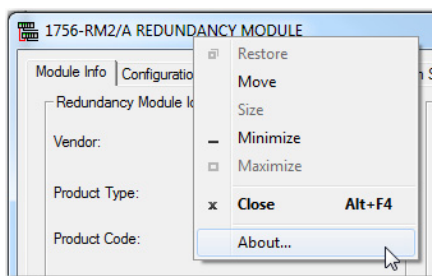
If Module Configuration is not available in the list of options, RMCT version 8.4.1.0 has not been installed.

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

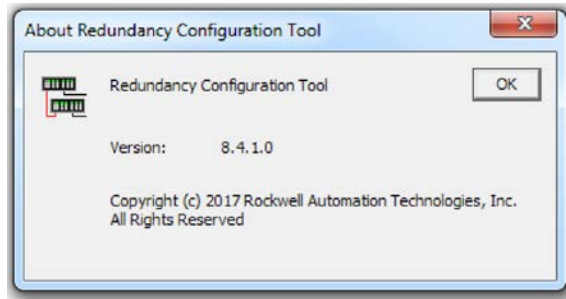


The Module Configuration dialog box opens.

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



The About dialog box opens and indicates the RMCT version.



The RMCT launches at the version that is compatible with the 1756-RM2 or 1756-RM2XT redundancy module firmware that is installed.

You must update your RMCT version and the redundancy module firmware revision so it is compatible with the new RMCT version. If you do not perform this update, the About dialog box cannot reflect the new RMCT version.

## Download and Install ControlFLASH Software

If you upgrade to redundancy firmware revision 30.051, 31.052, 32.051, or 33.051, ControlFLASH and ControlFLASH Plus software is not included in the redundancy firmware revision kits.

To find the compatible version of ControlFLASH and ControlFLASH Plus software to download, go to the [Product Compatibility and Download Center](#) and view the release notes for your redundancy firmware revision kit.

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**IMPORTANT** If you are only upgrading to redundancy firmware revision 24.052, the compatible version of ControlFLASH software is included in redundancy firmware revision 24.052\_kit1. However, ControlFLASH 14.01.00 is compatible with redundancy firmware revision 24.052.

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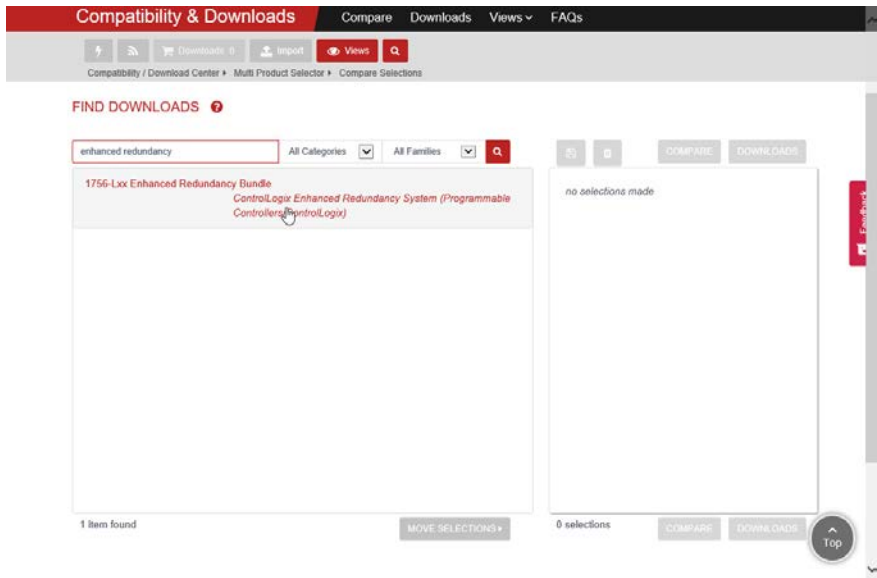
For information on how to download and install ControlFLASH or ControlFLASH Plus software, see:

- ControlFLASH Firmware Upgrade Kit User Manual, publication [1756-UM105](#)
- ControlFLASH Plus Quick Start Guide, publication [CFP-QS001](#)

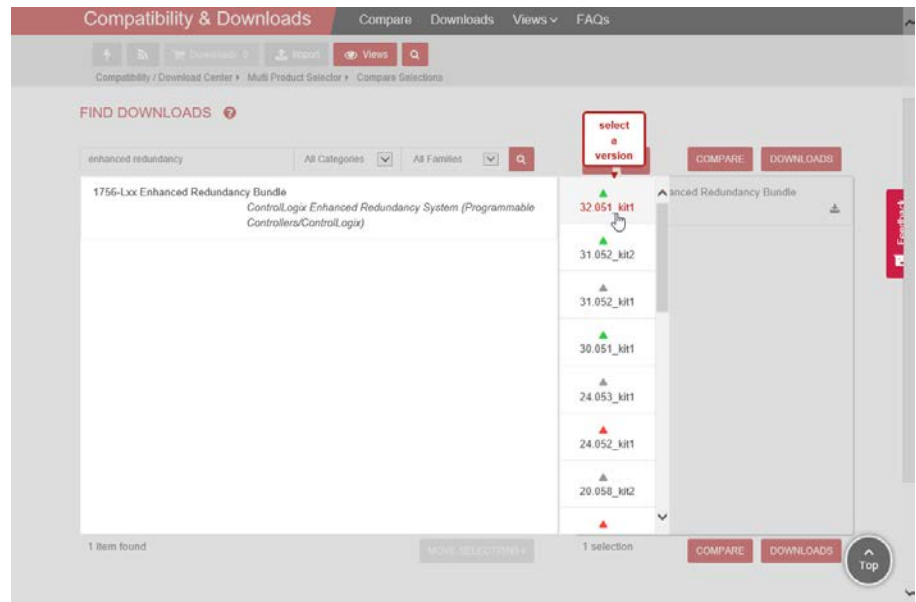
## Download the Redundancy Firmware Bundle and RMCT

To download the appropriate redundancy firmware bundle, follow these steps:

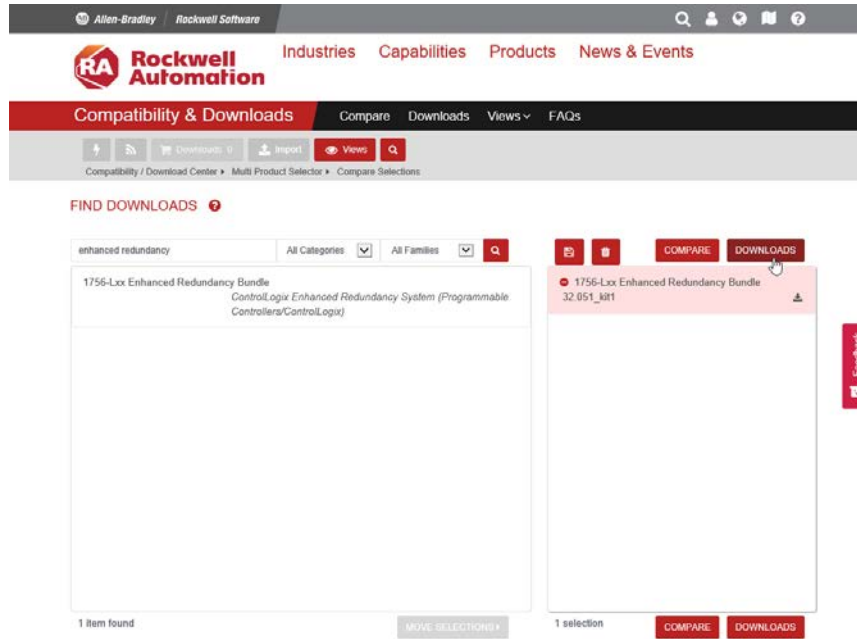
1. Go to [Find Downloads](#).
2. Search for “Enhanced Redundancy”.
3. Click on the Redundancy Bundle.



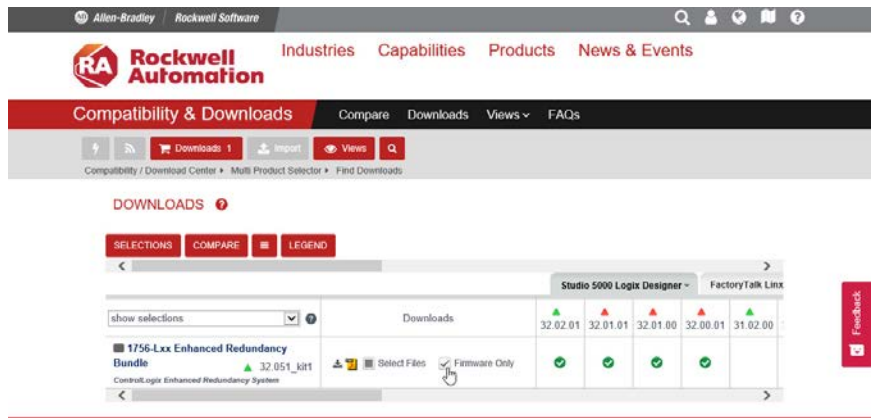
4. Select the appropriate Enhanced Redundancy Bundle version.



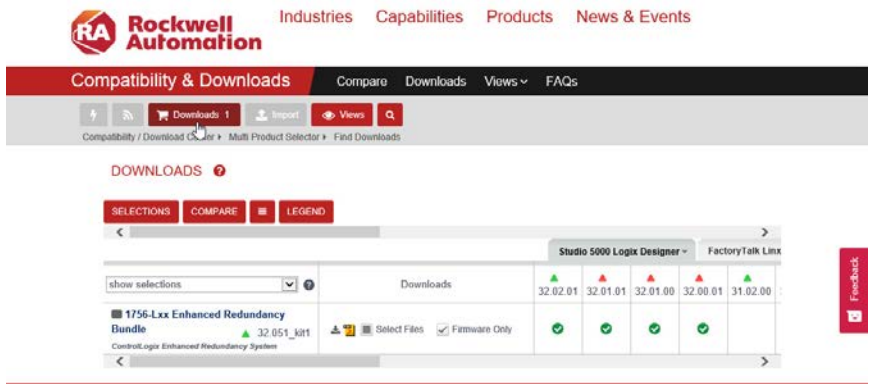
- Select the redundancy bundle, and click Downloads.



- Select Firmware Only.



- Click Downloads.

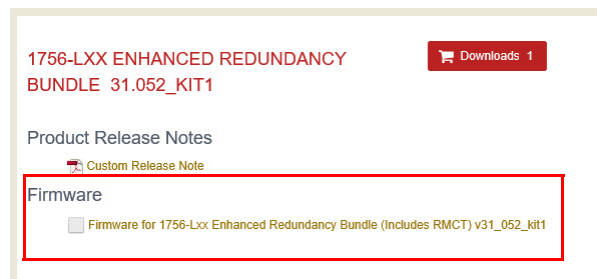


8. On the Download Cart dialog, make sure that the firmware is selected, and click Download now.



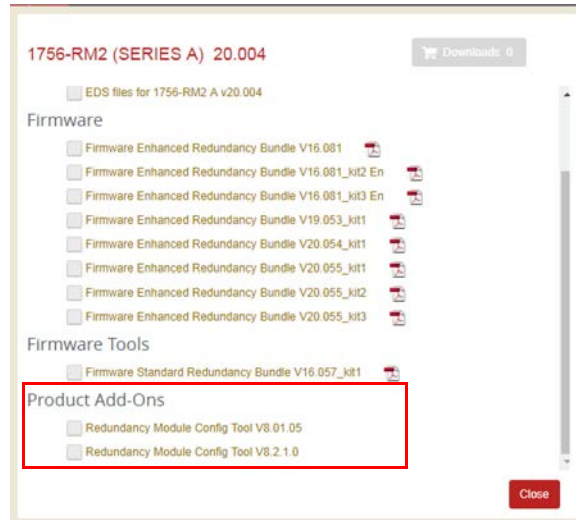
9. You have to log in to download the redundancy firmware bundle. Follow the download instructions on the website.

The RMCT is included in the downloads for most redundancy bundles. For redundancy bundles that use firmware revision 20.007 or later for 1756-RM2 modules, the RMCT is included in the redundancy bundle and is not available for separate download.



For redundancy bundles that use firmware revision earlier than 20.007, you can download the RMCT separately as a product add-on:

1. Go to [Find Downloads](#).
2. Search for your controller.
3. Search for the redundancy module.
4. You can select the RMCT as part of the Product Add-Ons download.



## Install the Redundancy Firmware Bundle

This section details how to install the Redundancy Firmware Bundle.

- To update to revision 24.052\_kit1, see [Install the revision 24.052\\_kit1 Redundancy Firmware Bundle on page 15](#)
- To update to revision 24.053\_kit1, see [Install the Revision 24.053\\_kit1 Redundancy Firmware Bundle on page 16](#).
- To update to revision 30.051\_kit1, see [Install the Revision 30.051\\_kit1 Redundancy Firmware Bundle on page 17](#).
- To update to revision 30.051\_kit2, see [Install the Revision 30.051\\_kit2 Redundancy Firmware Bundle on page 18](#).
- To update to revision 31.052\_kit1, see [Install the Revision 31.052\\_kit1 Redundancy Firmware Bundle on page 19](#).
- To update to revision 31.052\_kit2, see [Install the Revision 31.052\\_kit2 Redundancy Firmware Bundle on page 20](#).
- To update to revision 32.051\_kit1, see [Install the Revision 32.051\\_kit1 Redundancy Firmware Bundle on page 21](#).
- To update to revision 33.051\_kit1, see [Install the Revision 33.051\\_kit1 Redundancy Firmware Bundle on page 22](#).
- To update to revision 33.051\_kit2, see [Install the Revision 33.051\\_kit2 Redundancy Firmware Bundle on page 23](#).

## Install the revision 24.052\_kit1 Redundancy Firmware Bundle

If you are updating to revision 24.052\_kit1, follow the steps in the section.



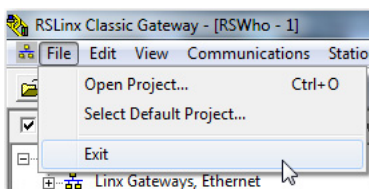
Create a 24.052 firmware directory on your computer first, so you can unzip the firmware files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx® Classic software:

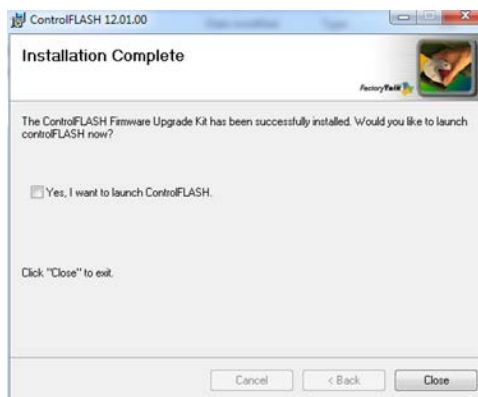
- Right-click the RSLinx Classic icon in the notification area of the screen and choose Shutdown RSLinx Classic.



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



1. Browse to the location of the redundancy firmware revision 24.052\_kit1
2. Unzip the redundancy firmware kit on your computer.
3. Browse to the directory on your computer that has the redundancy firmware bundle, and unzip the Redundancy Module Configuration Tool version 8.3.1.0 on your computer.
4. Browse to the directory on your computer that has the redundancy firmware kit, and double-click ControlFlash.msi.
5. When the installation is complete, a dialog appears.
6. Clear the Yes, I want to launch ControlFLASH™ checkbox.



7. Click Close.

## Install the Revision 24.053\_kit1 Redundancy Firmware Bundle

If you are updating revision 24.053\_kit1, follow the steps in this section.



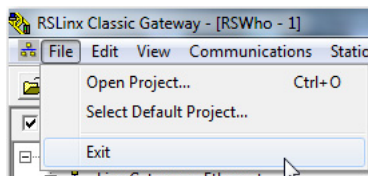
Create a 24.053 firmware directory on your computer first, so you can unzip the firmware files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

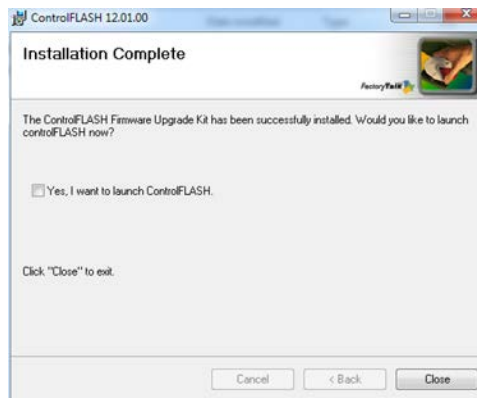
- Right-click the RSLinx Classic icon in the notification area of the screen and choose Shutdown RSLinx Classic.



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



1. Browse to the location of the redundancy firmware revision 24.053\_kit1
2. Unzip the redundancy firmware kit on your computer.
3. Browse to the directory on your computer that has the redundancy firmware bundle, and unzip the Redundancy Module Configuration Tool version 8.4.1.0 on your computer.
4. Browse to the directory on your computer that has the redundancy firmware kit, and double-click ControlFlash.msi.
5. When the installation is complete, a dialog appears.



6. Clear Yes, I want to launch ControlFLASH.
7. Click Close.



## Install the Revision 30.051\_kit1 Redundancy Firmware Bundle

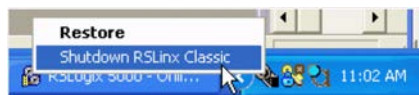
If you are updating to revision 30.051\_kit1, follow the steps in this section.



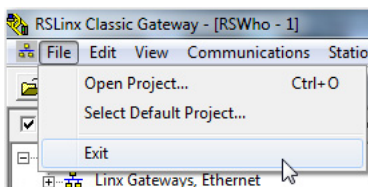
Create a 30.051 firmware directory on your computer first, so you can unzip the firmware files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

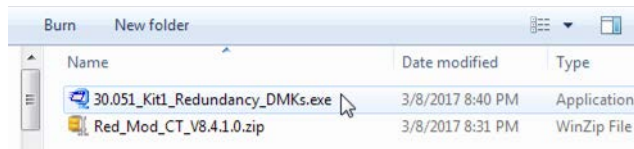
- Right-click the RSLinx Classic icon in the notification area of the screen and choose Shutdown RSLinx Classic.



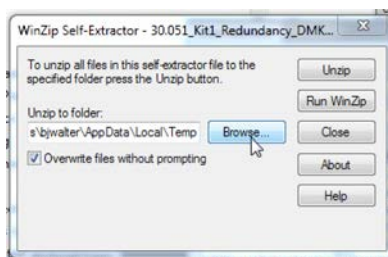
- In RSLinx Classic software, from the File menu, choose Exit and Shutdown.



1. Browse to the location of redundancy firmware revision 30.051\_kit1.
2. Unzip the redundancy firmware bundle on your computer.
3. Browse to the directory on your computer that has the redundancy firmware bundle, and unzip the Redundancy Module Configuration Tool version 8.4.1.0 on your computer.
4. Browse to the directory on your computer that has the redundancy firmware kit, and double-click 30.051\_Kit1\_Redundancy\_DMKs.exe.



5. On the WinZip Self-Extractor dialog, click Browse and choose the location to install the files.



6. After you choose your location, click extract.
7. On the installation successful dialog, click OK



8. On the WinZip Self-Extractor dialog, click Close.

## Install the Revision 30.051\_kit2 Redundancy Firmware Bundle

If you are updating to revision 30.051\_kit2, follow the steps in this section.

---

**IMPORTANT** If a system is at 30.051\_kit2, and uses Ethernet modules with firmware revision 11.003 or ControlNet modules with firmware revision 25.006, **it is not possible** to update to 31.052\_kit1 or 31.052\_kit2.

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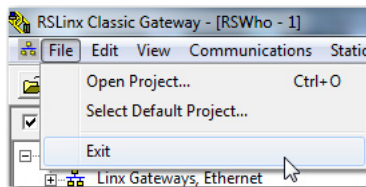
Create a 30.051 firmware directory on your computer first, so you can unzip the firmware files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V30.051\_kit2\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you will have these files:
  - Firmware: V30.051\_kit2\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.0.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Revision 31.052\_kit1 Redundancy Firmware Bundle

If you are updating to revision 31.052\_kit1, follow the steps in this section.



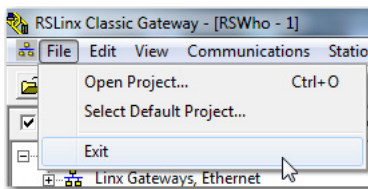
Create a 31.052\_kit1 firmware directory on your computer first, so you can unzip the files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V31.052\_kit1\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you have these files:
  - Firmware: V31.052\_kit1\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.o.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Revision 31.052\_kit2 Redundancy Firmware Bundle

If you are updating to revision 31.052\_kit2, follow the steps in this section.

---

**IMPORTANT** If a system is at 31.052\_kit2, and uses Ethernet modules with firmware revision 11.002, it **is not possible** to update to 32.051\_kit1.

---



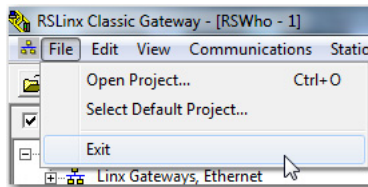
Create a 31.052\_kit2 firmware directory on your computer first, so you can unzip the files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V31.052\_kit2\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you will have these files:
  - Firmware: V31.052\_kit2\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.0.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Revision 32.051\_kit1 Redundancy Firmware Bundle

If you are updating to revision 32.051\_kit1, follow the steps in this section.



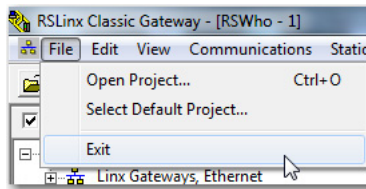
Create a 32.051 firmware directory on your computer first, so you can unzip the files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V32.051\_kit1\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you will have these files:
  - Firmware: V32.051\_kit1\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.o.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Revision 33.051\_kit1 Redundancy Firmware Bundle

If you are updating to revision 33.051\_kit1, follow the steps in this section.



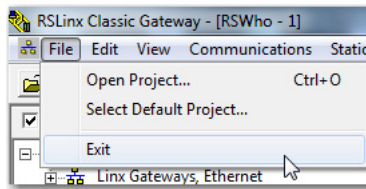
Create a 33.051 firmware directory on your computer first, so you can unzip the files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V33.051\_kit1\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you will have these files:
  - Firmware: V33.051\_kit1\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.o.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Revision 33.051\_kit2 Redundancy Firmware Bundle

If you are updating to revision 33.051\_kit2, follow the steps in this section.



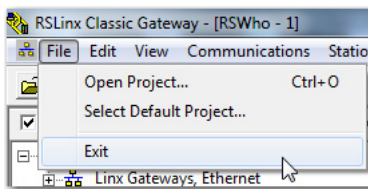
Create a 33.051 firmware directory on your computer first, so you can unzip the files to this directory.

Before you update software for your redundant system, use one of these methods to shut down RSLinx Classic software:

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



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



1. Browse to the location of redundancy firmware revision V33.051\_kit2\_ENHCLXRED.zip.
2. Unzip the redundancy firmware bundle on your computer. After you unzip, you will have these files:
  - Firmware: V33.051\_kit2\_CLXRED.dmk
  - Redundancy Module Configuration Tool version 8.05.01: Red\_Mod\_CT\_V8.5.1.o.zip
3. Unzip the Redundancy Module Configuration Tool version 8.05.01 on your computer.

## Install the Redundancy Module Configuration Tool

If needed, install the latest version of the RMCT.

---

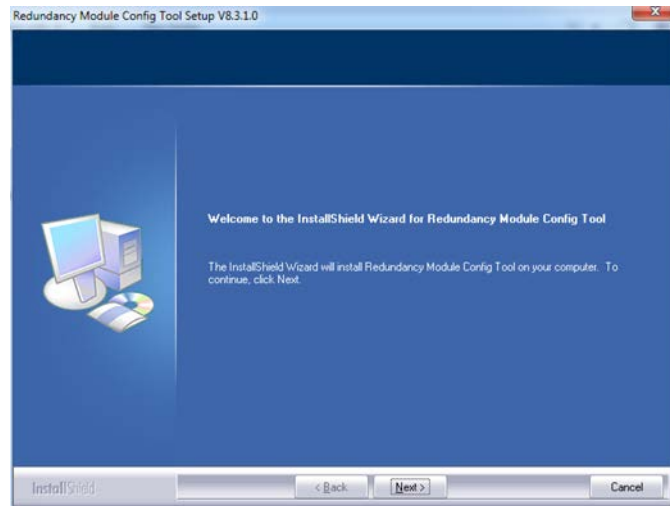
**IMPORTANT** If you have RMCT version 7 or earlier, it does not support the 1756-RM2 modules. For more information on the RMCT, see Knowledgebase article [Redundancy Module Configuration Tool \(RMCT\)](#).

---

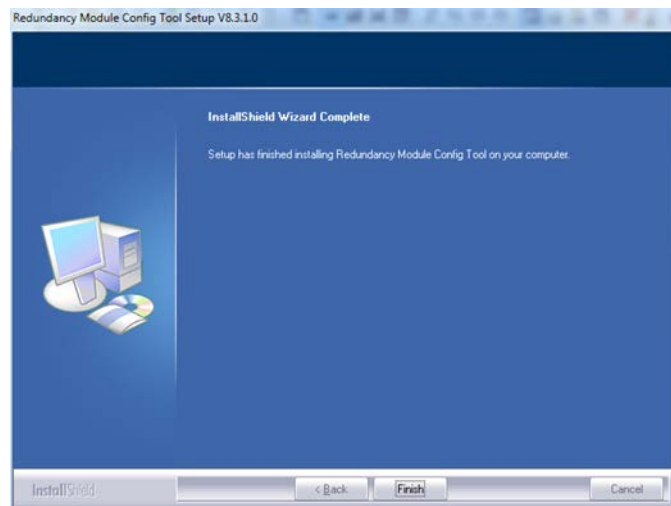
**IMPORTANT** You must uninstall any existing version of the Redundancy Module Configuration Tool (RMCT) before you install the RMCT, version 8.4.1.0 or later. If you do not uninstall the previous version, you can have difficulty if you try to uninstall version 8.5.1.0 or later at another time.

---

1. Browse to the RMCT directory on your computer.
2. Double-click setup.exe.
3. On the RMCT Setup dialog, click Next.



4. When the installation is complete, click Finish.





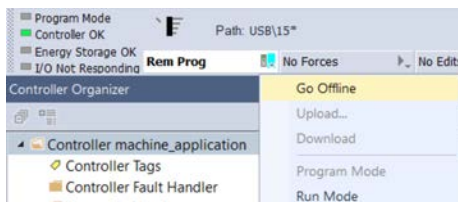
## Install the Logix Designer Application

This section describes how to install the Logix Designer application version that is compatible with your redundancy firmware bundle.

**IMPORTANT** If you update your programming software from version 20 to version 24, and the controller's project was created in software version 23, we **strongly recommend** that you read Knowledgebase Article [RSLogix 5000® Software, Version 20.03](#).

A login is required to access the article.

1. If your controller project is online, go offline.

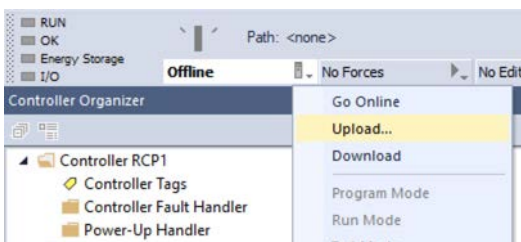


2. Exit out of the programming software.
3. Download and install the version of Studio 5000 Logix Designer application that is compatible with your redundancy firmware bundle.
4. Continue with [Prepare the Controller Project for the Update on page 25](#).

## Prepare the Controller Project for the Update

To prepare the controller project and controllers for the update, complete these steps.

1. Start the Logix Designer application, and select your redundancy project.
2. Go online with the primary controller.
3. To make sure that your off-line project has the latest updates, or in case you do not have an off-line file, upload the project from the primary controller.

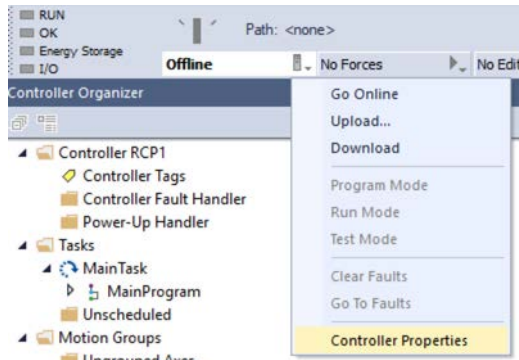


4. Verify that the watchdog time is set to a value that corresponds with the requirements of the redundancy system revision and your application.
5. Cancel or assemble any pending test edits.
6. Remove all sequential function chart (SFC) forces from the project.
7. Verify that no changes are required for the following:
  - I/O forces
  - I/O configuration

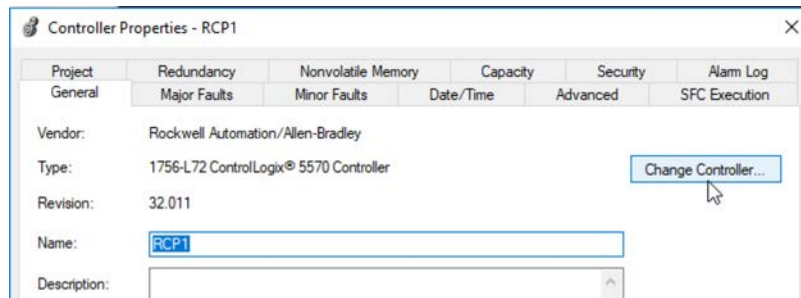
After this step, changes to I/O cannot be made until after the redundancy system revision update is complete and both chassis are synchronized.

8. Save the project.
9. Go offline.

10. Click Controller Properties.



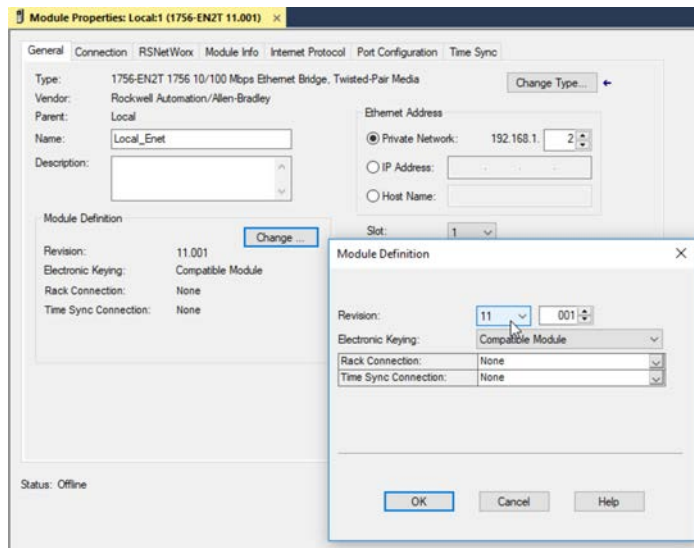
11. Click Change Controller.



12. Specify the controller revision that you are upgrading to.
13. If you install a new controller while upgrading the secondary chassis firmware, specify the new controller catalog number.
14. Click OK.

The Logix Designer application converts the project to the later revision.

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



If you are unable to specify the new revision, you must change the Electronic Keying parameter to Compatible Module. You must also select the highest available firmware revision.

16. Save the project.
17. If your project contains LINT tags inside a UDT, or you use produce/consume tags with LINT member, you must make sure the LINT members and UDTs with LINT Members align on 8-byte boundaries. See the following:
  - a. [Align LINT Members on 8-byte Boundaries on page 51](#)
  - b. Logix Designer online help topic: 'LINT data types within this tag now align on 8-byte boundaries. Check produce/consume connection'.
18. Continue with [Update the Redundancy System Firmware on page 27](#).

## Update the Redundancy System Firmware

You can update redundancy firmware to another revision while your process continues to run. This update is known as **Redundancy System Update (RSU)**.

- 
- IMPORTANT** Remember the following before using this section:
- RSU is available when upgrading only from one redundancy version to another.
  - You can update only from firmware revision 20.054 or later with this section.
  - RSU support for enhanced redundancy starts at 16.081
  - The process for going to versions prior to V24 are documented in the release notes of the version of interest.
  - If you update from revision 20.054 to revision 30.051, you must first update to revision 24.053 before you update to revision 30.051.
  - If you update from revision 24.052 (or a later revision in V24) to revision 31.052, you must first update to revision 30.051 before you update to revision 31.052.
  - If you update from revision 24.052 to revision 32.051, you must first update to revision 30.051, and then update to revision 31.052 before you update to revision 32.051.
  - If you update from revision 24.052 to revision 33.051, you must first update to revision 30.051, then update to revision 31.052, and then update to revision 32.051 before you update to revision 33.051.
- You must use this process if the following conditions exist:
- You are upgrading from a redundancy system to revision 24.052\_kit1 or later.
  - Your project does not require EtherNet/IP™ modules to use Electronic Keying = Exact Match.
-

## Before You Begin

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

- During the update procedures, you cannot use the programming software to change the mode of the controller. Instead, use the mode switch on the front of the controller.
- If you are using a ControlNet® network, 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 update process.
- Remember the following when completing the tasks described in the rest of this section:
  - Do not change the project other than with changes that are identified in these tasks.
  - Verify that no one else is also changing the project.
  - Do not use a FactoryTalk® Batch Server to change equipment phase-states when upgrading your redundancy system.

---


**IMPORTANT** If your system has 1756-RM or 1756-RMXT modules, you must replace them with 1756-RM2 or 1756-RM2XT modules. See [Replace a 1756-RM Module with a 1756-RM2 Module on page 51](#) for more information.

---

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

| Task   | Page |
|--|------|
| Prepare the Redundant Chassis for the Firmware Update                                | 29   |
| Update the Redundancy Module Firmware in the Primary Chassis                         | 30   |
| Update Redundancy Module Firmware and Other Module Firmware in the Secondary Chassis | 32   |
| Lock the System and Initiate a Switchover to Update                                  | 33   |
| Update the New Secondary Chassis Firmware  | 35   |
| Synchronize the Redundant Chassis  | 37   |

---

 **WARNING:** While you complete the processes to update the redundancy system firmware, you will not have a redundant system. The controller runs the machinery without a backup until the update is completed.

---

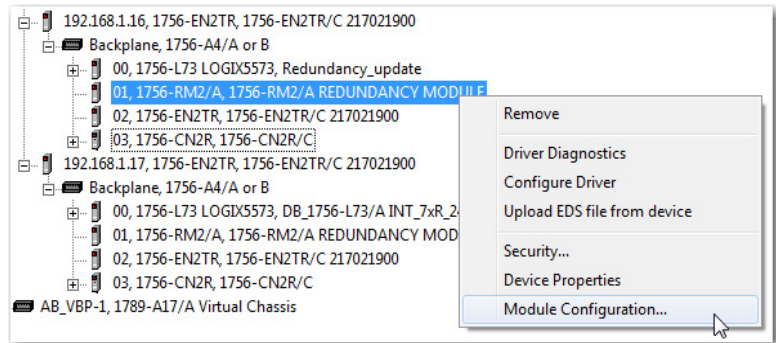
## Prepare the Redundant Chassis for the Firmware Update

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

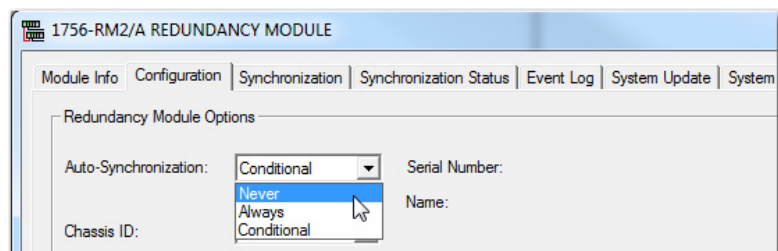
1. Set the mode switch of the primary and secondary controllers to REM.

If the redundant controllers in both chassis of the redundant chassis pair are not in Remote RUN (REM) mode, the redundancy firmware update cannot be completed.

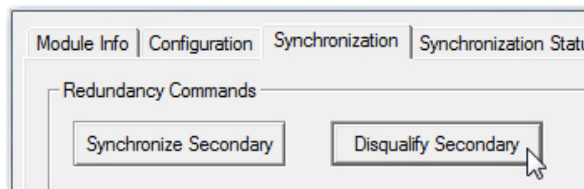
2. Open RSLinx Classic software and browse to the redundancy module.
3. To open the RMCT, right-click the redundancy module and choose Module Configuration.



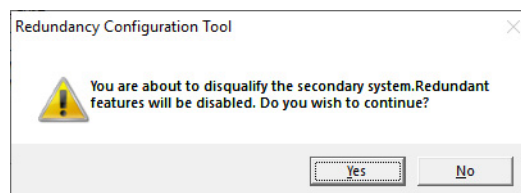
4. Click the Configuration tab in the RMCT.
5. From the Auto-Synchronization pull-down menu, choose Never.



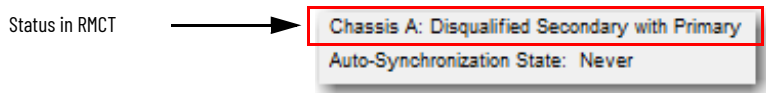
6. Click Apply, and then click Yes.
7. Click the Synchronization tab.



8. Click Disqualify Secondary.
9. On the RMCT Confirmation dialog, click Yes.



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



10. Click OK, and close the RMCT.

If you close the RMCT, it helps prevent a timeout from occurring when the firmware of the redundancy module is updated.

11. Continue with [Update the Redundancy Module Firmware in the Primary Chassis on page 30](#).

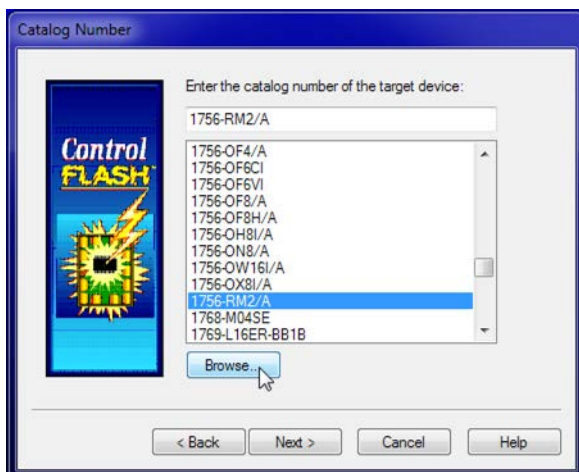
### Update the Redundancy Module Firmware in the Primary Chassis

**IMPORTANT** If your system has 1756-RM or 1756-RMXT modules, you must replace them with 1756-RM2 or 1756-RM2XT modules. See [Replace a 1756-RM Module with a 1756-RM2 Module on page 51](#) for more information.

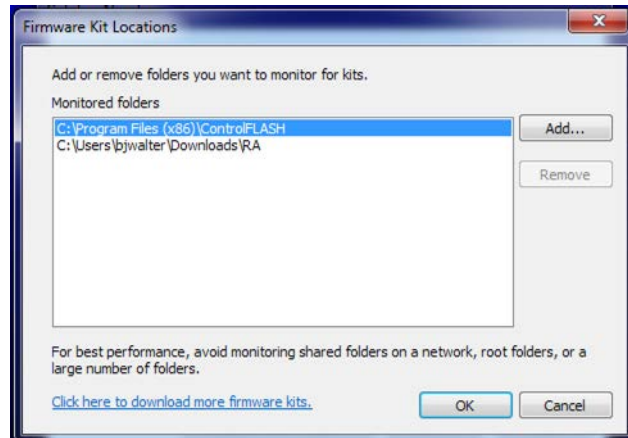
Make sure that the primary chassis is powered on. If you have to power on the chassis, wait at least 45 seconds after powerup before you begin the update. During this time, the redundancy module conducts internal power-up sequence operations and is not ready for an update.

Complete these steps to update the redundancy module firmware in the primary chassis.

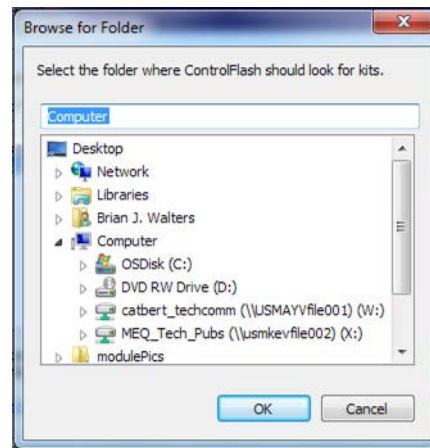
1. Launch ControlFLASH software and click Next.
2. Before you select a target device, you must first tell ControlFLASH where to look for firmware files. On the ControlFLASH dialog, click Browse.



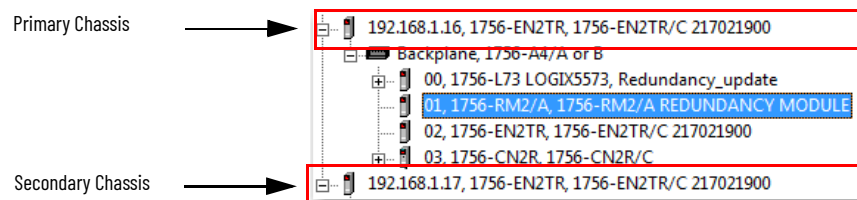
3. On the Firmware Kit Location dialog, if the location where you store firmware files is not in the Monitored folders list:
  - a. Click Add.



- b. On the Browse for Folder dialog, select the location of your firmware files.



- c. Click OK.
4. On the ControlFlash dialog, select the redundancy module catalog number as the target device.
5. Click Next
6. Browse to the redundancy module in the primary chassis and select it.



7. Click OK.
8. Select the firmware revision to update 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. On the Update Status dialog, click OK.
11. Close ControlFLASH.

## Update Redundancy Module Firmware and Other Module Firmware in the Secondary Chassis

Make sure that the secondary chassis is powered on. If you have to power on the chassis, wait at least 45 seconds before you begin the secondary update. During this time, the redundancy module conducts internal power-up sequence operations and is not ready for an update.

Complete these steps to update the firmware in the secondary chassis.

1. If you want to replace your module hardware, remove the module from the secondary chassis and replace it with the new module.

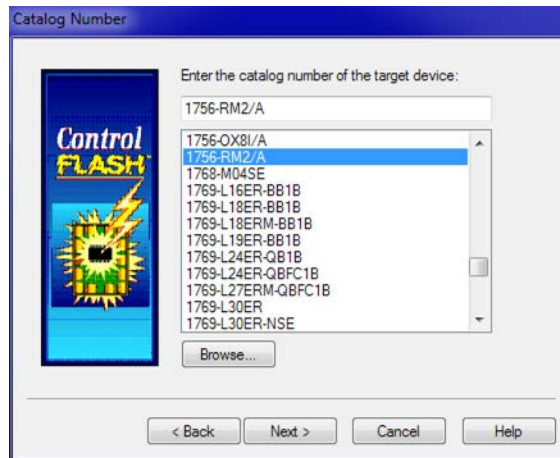
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**IMPORTANT** When replacing communications modules, make sure that the node address (for ControlNet modules), rotary switches, and Port Configuration (for Ethernet modules) match the existing modules.

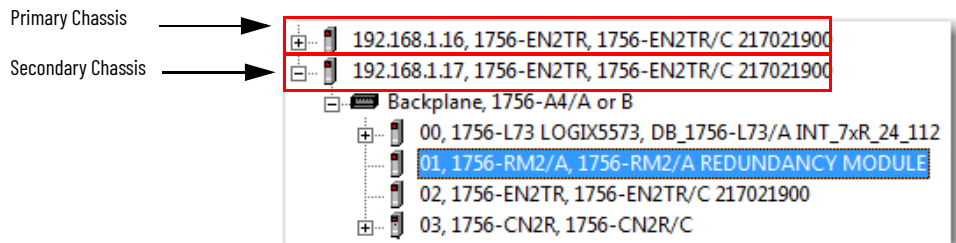
If you replace EtherNet/IP or ControlNet communication modules as part of this redundancy update, make sure that you have read through and are familiar with the [Replacement Considerations on page 39](#).

---

2. Launch ControlFLASH, and click Next.
3. Select the module catalog number and click Next.



4. Browse to the redundancy module in the secondary chassis and select it.



5. Click OK.
6. Select the firmware revision to update to and click Next.



7. 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.

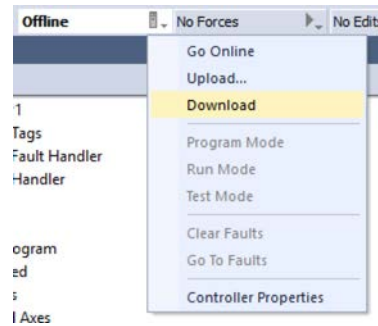
8. On the Update status dialog, click OK.
9. Repeat [steps 1 ...8](#) for each module in the secondary chassis.
10. Close ControlFLASH.
11. Download the project to the secondary controller.

---

**IMPORTANT** When you download a project that has I/O forces enabled, the application prompts you to enable or disable forces after the download completes.

After the locked switchover, the forces are whatever you selected (enabled or disabled).

---



12. After the download is complete, go offline.

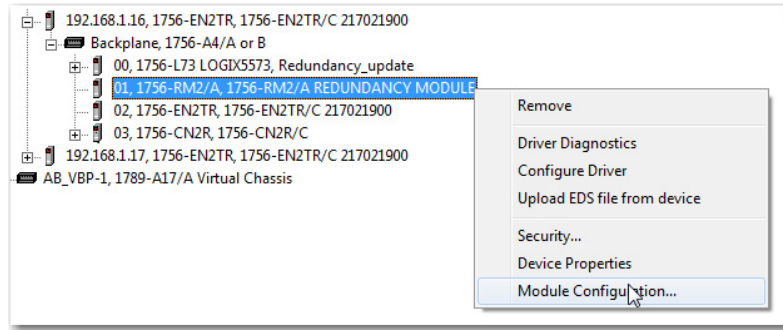
You are now ready to lock the system and initiate a locked switchover to update the primary chassis. Continue with [Lock the System and Initiate a Switchover to Update](#).

## Lock the System and Initiate a Switchover to Update

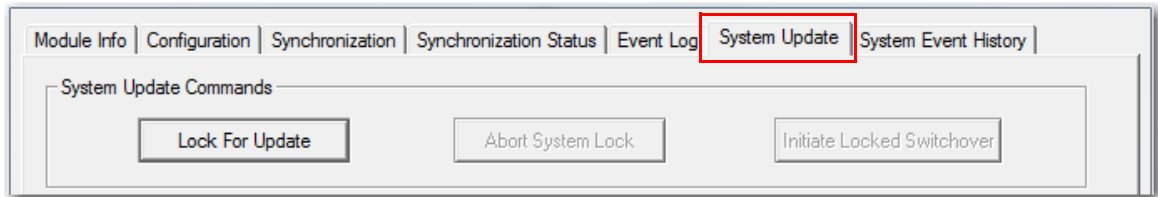
Once you have downloaded the controller project, complete these steps to lock the system and initiate a switchover.

- 
- IMPORTANT** Remain offline with your controller 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 action can cause the SFC instructions to execute twice.
-

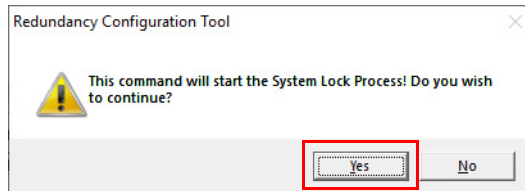
1. In RSLinx Classic software, right-click the redundancy module in the primary chassis and choose Module Configuration to open the RMCT.



2. Click the System Update tab

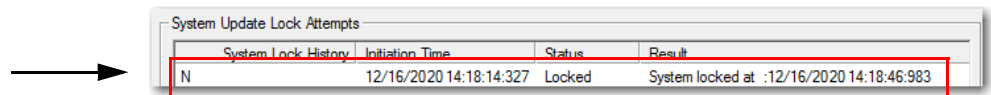


3. Click Lock For Update, and then click Yes at the Redundancy Configuration Tool dialog box.



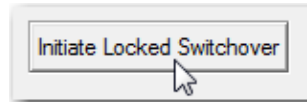
4. Wait for the system to lock.

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

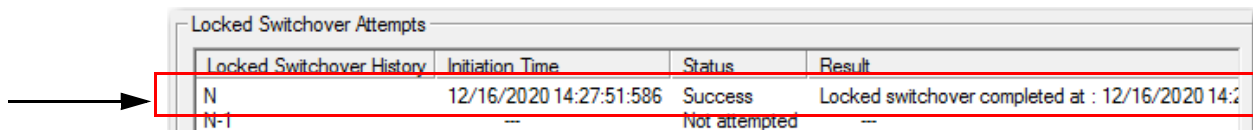


**IMPORTANT** For errors associated with Lock For Update, see Knowledgebase Article [Lock for Update Fails](#).

5. Click Initiate Locked Switchover, and then click Yes at the Redundancy Configuration Tool dialog box.



Your secondary chassis assumes control and becomes the primary chassis. When the switchover is complete, the Locked Switchover Attempts log indicates success.



| Locked Switchover History | Initiation Time         | Status        | Result   |
|---------------------------|-------------------------|---------------|--|
| N                         | 12/16/2020 14:27:51:586 | Success       | Locked switchover completed at : 12/16/2020 14:2 |
| N-1                       | --                      | Not attempted | --   |

The text in chassis status row indicates the switchover state in combination with the log.

Chassis B: Primary with Disqualified Secondary  
Auto-Synchronization State: Never

Once your locked switchover is complete, update the firmware revisions for modules in the new secondary chassis.

---

**IMPORTANT** After the locked switchover, the new 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 updated and the system is synchronized.

---

6. On the RMCT, click OK.

## Update 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 20.054\_kit1, 20.055\_kit1, 20.055\_kit2, 20.055\_kit3, 20.055\_kit4, or 20.056\_kit1 and Electronic Keying is set to Exact Match, Compatible Module or Disable Keying and you are either:

- 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.
- Replacing 1756-EN2T/C (or earlier) modules with EN2T/D modules, and the modules being replaced have rotary switches set to 2...254.

---

To update the firmware of all modules in the new secondary chassis, complete these steps.

1. If you are replacing and upgrading your module hardware, remove the module from the secondary chassis and replace it with the new module.
2. Launch ControlFLASH software and click Next.

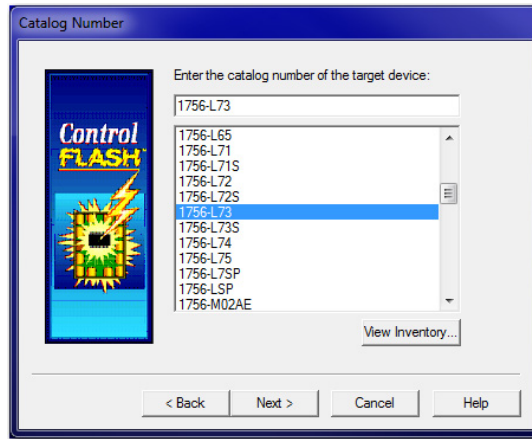
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**IMPORTANT** When replacing communications modules, make sure that the node address (for ControlNet modules), rotary switches, and Port Configuration (for Ethernet modules) match the existing modules.

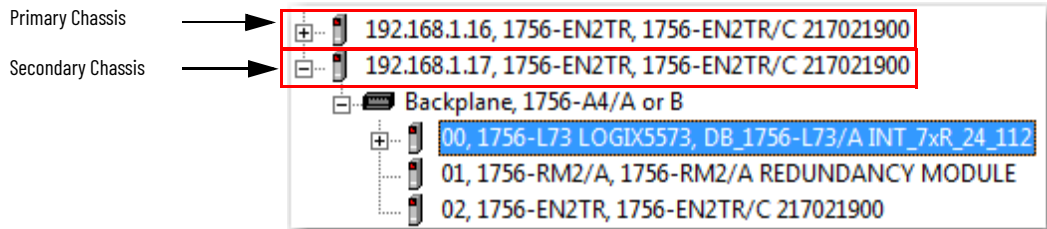
If you replace EtherNet/IP or ControlNet communication modules as part of this redundancy update, make sure that you have read through and are familiar with the [Replacement Considerations on page 39](#).

---

3. Select the module catalog number and click Next.

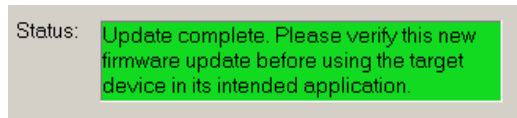


4. Browse to the module and select it.



5. Click OK.
6. Select the firmware revision to update to and click Next.
7. Click Finish.

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



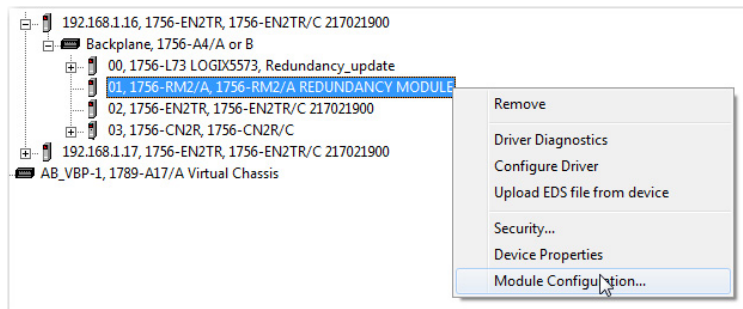
8. Complete steps 1...7 for each module in the new secondary chassis, including the new controllers, if applicable.

Once you either replace or update the firmware for each of the modules in the new secondary chassis, continue with [Synchronize the Redundant Chassis on page 37](#).

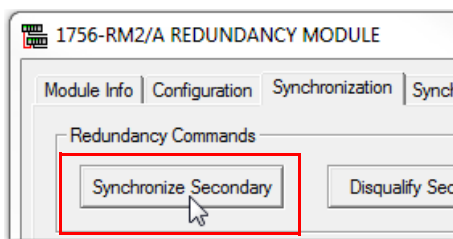
## Synchronize the Redundant Chassis

To synchronize the redundant chassis after firmware in both chassis have been updated to the same revision, complete these steps.

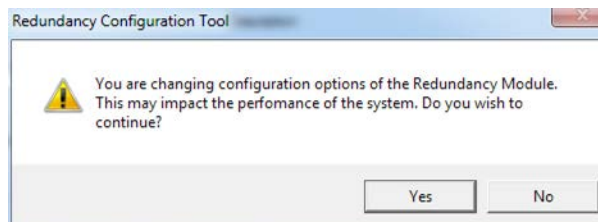
1. In RSLinx software, right-click the 1756-RM2 or 1756-RM2XT module in the primary chassis and choose Module Configuration to open the RMCT.



2. On the Synchronization tab, click Synchronize Secondary.



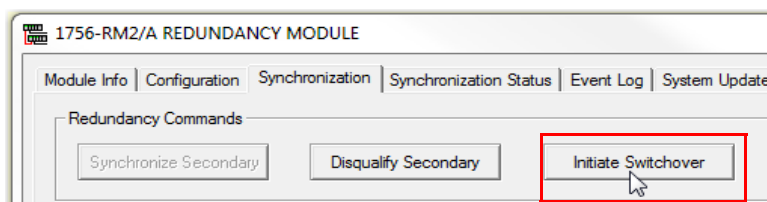
3. On the RMCT Confirmation dialog, click Yes.



Wait for synchronization to complete.

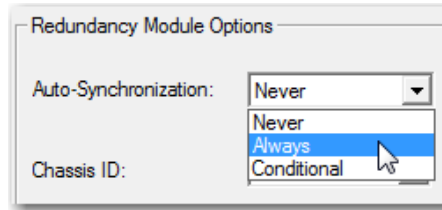
[Steps 4...8](#) are only applicable if the Ethernet switches are set between 2...254.

4. Initiate a switchover.

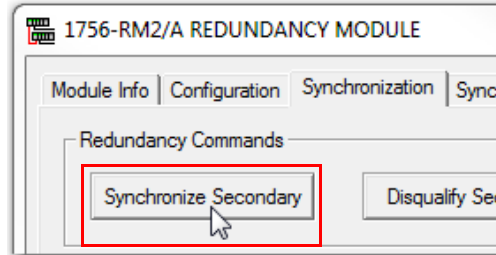


5. In the new secondary, set the rotary switches back to the original configuration.
6. Repeat this process for all Ethernet modules that need the rotary switches set back to 2...254.

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



- If necessary, manually synchronize the chassis.



- Set the redundancy module date and time according to your preference.
- Click OK.
- Close the RMCT.

## EDS Files

If you see modules that are displayed in RSLinx Classic with yellow question marks, the EDS files for the modules are not registered. You can right-click on the module and proceed with the “Upload EDS files from device” wizard to upload the EDS file. If this option is not available or as an alternative, follow this link to obtain the EDS files for modules in your system:

[Electronic Data Sheets \(EDS\)](#).

- Download the required EDS file.
- Choose Start > Programs > Rockwell Software® > RSLinx Tools > EDS Hardware Installation Tool.

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

Your redundant system firmware update is now complete.

## Replacement Considerations

| Topic  | Page |
|--|------|
| Before You Begin   | 39   |
| Replace a Module in the Secondary Chassis That Has the Same Catalog Number and Firmware Revision | 39   |
| Replace an EtherNet/IP Module with a New Series  | 40   |
| Replace a 1756-CN2 Module with a New Series  | 45   |
| Replace a 1756-RM Module with a 1756-RM2 Module  | 49   |

### Before You Begin

When replacing modules in ControlLogix® redundancy systems, there are considerations for these situations:

- Replace a module in the secondary chassis
- Replace an EtherNet/IP™ or ControlNet® communication module
- Replace a 1756-RM or 1756-RMXT module with a 1756-RM2 or 1756-RM2XT module

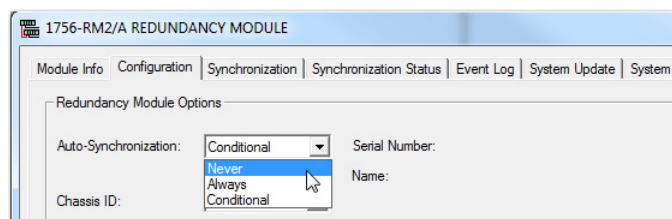
### Replace a Module in the Secondary Chassis That Has the Same Catalog Number and Firmware Revision

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)

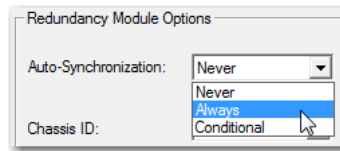
When you replace communication modules, make sure that the node address (for ControlNet modules), rotary switches, and Port Configuration (for EtherNet/IP modules) match the existing modules.

1. Using the Redundancy Module Configuration Tool (RMCT):
  - a. Set Auto-Synchronization to Never.

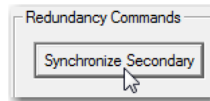


- b. Disqualify the redundant chassis pair (if not already disqualified).
2. Remove the module from the secondary chassis and replace it with the new module.

3. If applicable, update the module firmware by using ControlFLASH™ or ControlFLASH Plus™ software.
4. In the RMCT, from the Auto-Synchronization pull-down menu, choose your preferred method.



5. If necessary, manually synchronize the chassis.



## Replace an EtherNet/IP Module with a New Series

This section describes how to replace EtherNet/IP communication modules in a redundancy system without the need for a controller update.

You can replace the EtherNet/IP modules by using the following methods:

- [Synchronization and Switchover for EtherNet/IP Modules](#)

Use this method if Electronic Keying is not set to Exact match.

- [Update the Redundancy System Firmware](#)

Use this method if Electronic Keying is set to Exact Match. You must configure the new modules to use Exact Match.

---

**IMPORTANT** Consider the following:

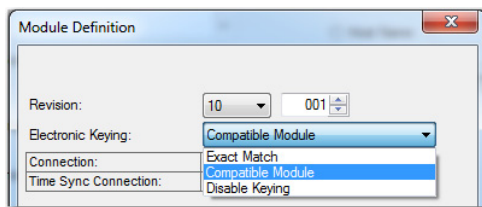
- Before replacing modules, make sure that you have the correct firmware for all new modules.
  - When you replace modules, you must do so in pairs or the system cannot synchronize after a switchover.
  - Partnered pairs of EtherNet/IP modules must use the same values for the following parameters for IP address swapping to work:  
IP addresses, Network mask, Gateway address
-



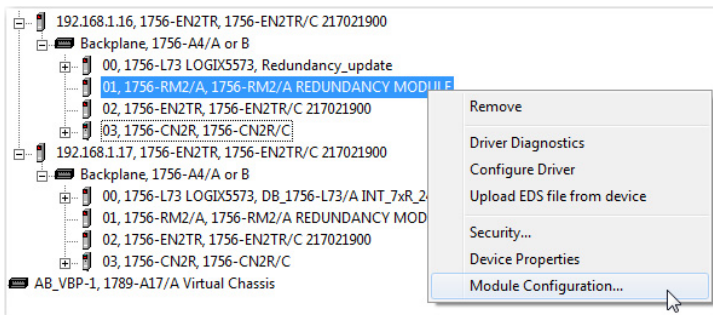
## Synchronization and Switchover for EtherNet/IP Modules

Complete these steps to replace EtherNet/IP modules with new series modules.

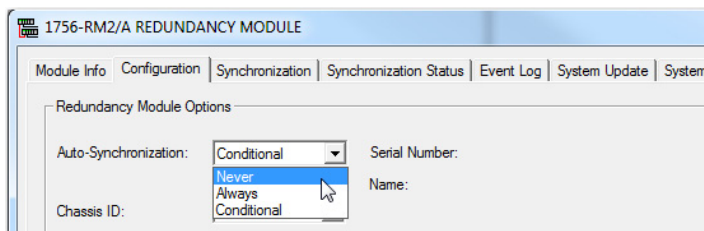
1. Make sure the existing module and replacement module use the same IP, Network Mask, and Gateway addresses.
2. For the Redundancy Module Configuration Tool (RMCT):
  - With redundancy firmware revision 24.052, make sure that the RMCT is at version 8.03.01 or later.
  - With redundancy firmware revision 30.051, make sure that the RMCT is at version 8.04.01 or later.
  - With redundancy firmware revision 24.053, 31.052, 32.051, or 33.051, make sure that the RMCT is at version 8.05.01.
3. Make sure that the redundancy module firmware is at the firmware revision for the specified bundle for only 1756-RM2 and 1756-RM2XT modules.
4. 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 redundancy module in either chassis.

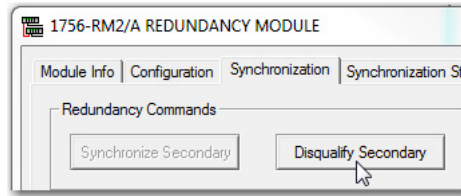


7. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Never.

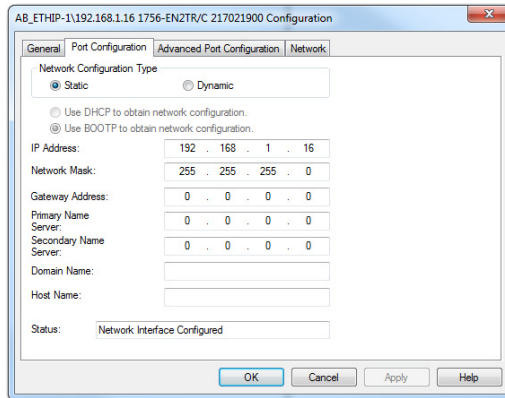


8. Click Apply.

9. On the Synchronization tab, click Disqualify Secondary.

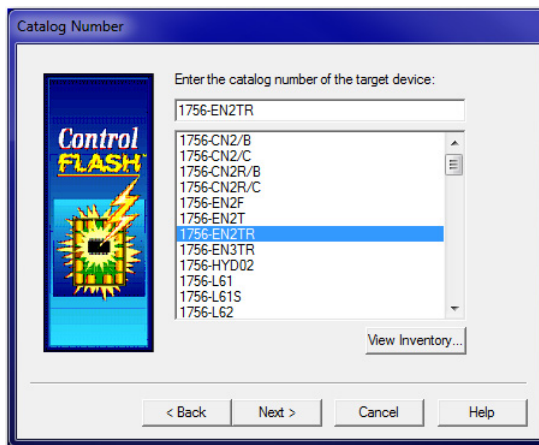


10. Make a note of the Port Configuration of the secondary Ethernet module.
- IP address
  - Network Mask
  - Gateway address

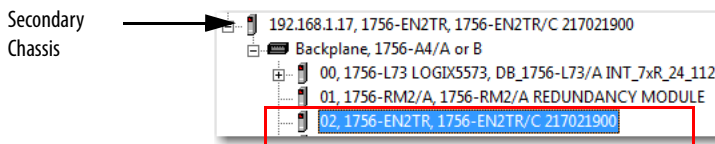


11. Disconnect the Ethernet cables from the secondary Ethernet module.
12. Turn off power to the secondary chassis.
13. Remove the EtherNet/IP module from the secondary chassis.
14. Set the switches on the new EtherNet/IP module to 888, insert the module in the secondary chassis, and apply power to the 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 module that was removed.
  - c. Reinsert the module into the secondary chassis, reattach the cable, and apply power to the secondary chassis.
  - d. To support bridging across the backplane (or via the USB port), configure the Port Configuration of the secondary module to match the Port Configuration of the primary module.

15. If you have not already done so, update the firmware of the new EtherNet/IP module.
  - a. Launch ControlFLASH software, and click Next.
  - b. Select the Ethernet module catalog number and click Next.

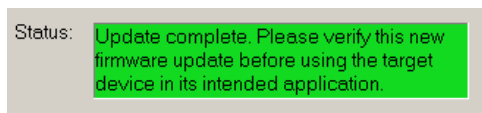


- c. Browse to the module in the secondary chassis and select it.



- d. Click OK.
- e. Select the firmware revision to update to and click Next.
- f. Click Finish.

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

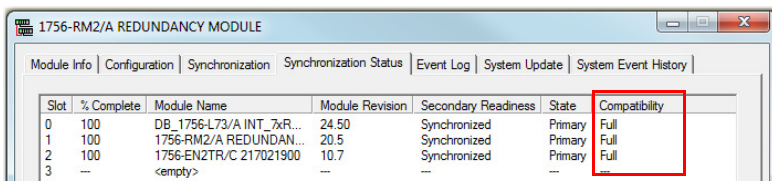


Wait for the update to complete.

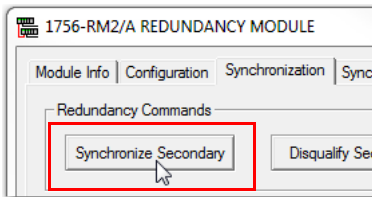
- g. After the update completes, connect the Ethernet cable to the secondary Ethernet module, and wait for communication to resume on the network.
16. Repeat steps [10...15](#) for all EtherNet/IP modules in the secondary chassis.

Complete these steps to verify module compatibility and synchronization.

1. At the Synchronization status tab, verify that the Synchronization Status tab indicates that the modules are fully compatible.

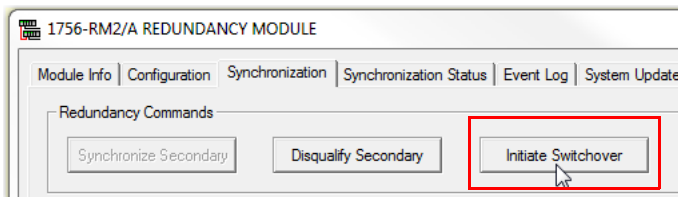


2. On the Synchronization tab, synchronize the secondary chassis.

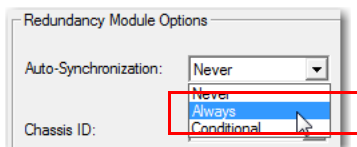


Wait for synchronization to complete.

3. Initiate a switchover.



4. Disconnect the Ethernet cables from the secondary Ethernet module.
5. Turn off power to the secondary chassis.
6. Remove the module from the secondary chassis.
7. Set the switches on the new EtherNet/IP module to 888 and insert it in the secondary chassis.
  - a. After the reset is complete, remove the module from the secondary chassis.
  - b. Set the switches to the same settings as on the module that was removed.
  - c. Reinsert the module into the secondary chassis, reattach the cable, and apply power to the secondary chassis.
  - d. To support bridging across the backplane (or via the USB port), configure the Port Configuration of the secondary module to match the Port Configuration of the primary module.
  - e. If you have not already done so, update the firmware of the new EtherNet/IP module.
8. Repeat the steps 4... 7 for all EtherNet/IP modules in secondary chassis.
9. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Always.



10. Click Apply, Yes, and OK.
11. Verify that the secondary chassis has qualified.

## Replace a 1756-CN2 Module with a New Series

This section describes how to replace ControlNet communication modules in a redundancy system. You can replace the 1756-CN2/B modules with 1756-CN2/C modules by using the following methods:

- [Synchronization and Switchover for the ControlNet Modules](#)

Use this method if Electronic Keying is set to Disable or Compatible Module.

- [Update the Redundancy System Firmware](#)

Use this method if Electronic Keying is set to Exact Match.

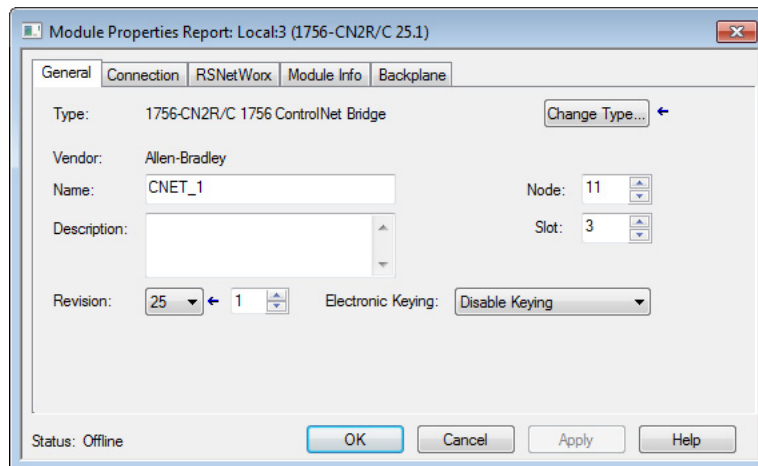
- 
- IMPORTANT**
- Before replacing modules, make sure that you have the correct firmware for all new modules.
  - When you replace modules, you must do so in pairs or the system cannot synchronize after a switchover.
  - When you update 1756-CN2/B modules to 1756-CN2/C modules, you must do so in pairs. If not, the system cannot synchronize after a switchover.
  - Replace 1756-CN2/B with 1756-CN2/C, and 1756-CN2RXT/B modules with 1756-CN2RXT/C modules.
- 

## Synchronization and Switchover for the ControlNet Modules

Complete these steps to replace ControlNet modules.

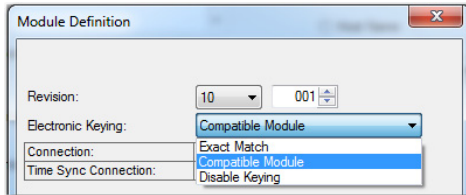
1. Add the EDS files for the modules, if you have not already done so.
2. Make a note of the Node configuration of the ControlNet module.

In this example, the primary ControlNet Node is configured to be Node 11. The Node value of the secondary ControlNet module must be the same value as the primary module.

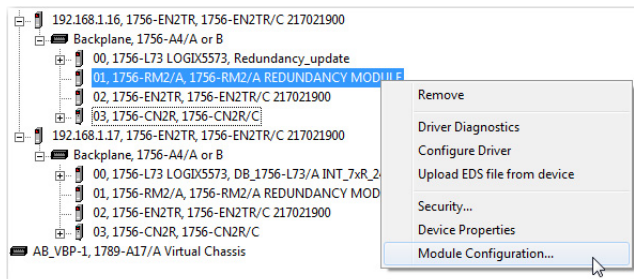


3. For the Redundancy Module Configuration Tool (RMCT):
  - With redundancy firmware revision 24.052, make sure that the RMCT is at version 8.03.01 or later.
  - With redundancy firmware revision 30.051, make sure that the RMCT is at version 8.04.01 or later.
  - With redundancy firmware revision 24.053, 31.052, 32.051, 33.051, make sure that the RMCT is at version 8.05.01

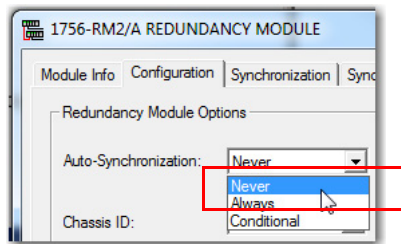
4. For the 1756-RM2 and 1756-RM2XT modules:
  - With redundancy firmware revision 24.052, make sure that the redundancy module firmware is revision 20.007.
  - With redundancy firmware revision 24.053, or 30.051, make sure that the redundancy module firmware is revision 20.009.
  - With redundancy firmware revision 31.052, 32.051, or 33.051, make sure that the redundancy module firmware is revision 20.010.
5. Go online with the primary controller.
6. For each module, verify that Electronic Keying is set to Compatible Module or Disable Keying.



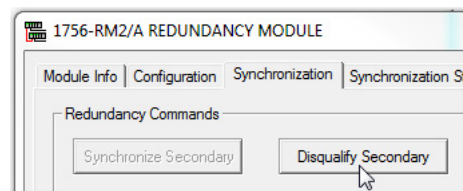
7. In the RSLinx® Classic software, start the RMCT for the redundancy module in the primary chassis.



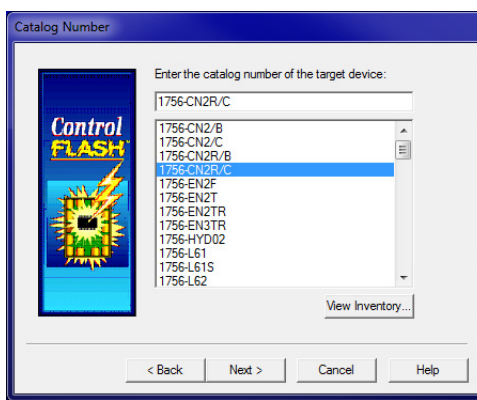
- a. Start RSLinx® Classic Software.
  - b. Select Communications and choose RSWho.
  - c. Open the branches of your network until you find the redundancy module in the primary chassis.
  - d. Right-click the redundancy module, and choose Module Configuration.
8. On the Configuration tab, from the Auto-Synchronization pull-down menu, choose Never.



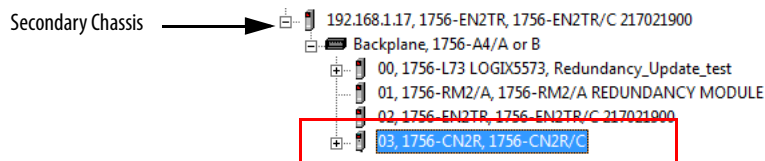
9. Click Apply and then Yes.
10. On the Synchronization tab, click Disqualify Secondary and then click Yes.



11. Disconnect the coaxial cables from the secondary ControlNet module.
12. Remove the original ControlNet module from the secondary chassis.
13. Set the switches in the new module to 00 and insert the module into the secondary chassis.
14. After the reset is complete in the new ControlNet module, remove the module from the secondary chassis.
15. Set the switches in the new ControlNet module to the correct Node value and reinsert the module into the secondary chassis.
16. Reconnect the coaxial cable to the new secondary ControlNet module.
17. Update the firmware of the ControlNet module in the secondary chassis.
  - a. If necessary, complete the following steps to update module firmware.
  - b. Launch ControlFLASH software, and click Next.
  - c. Select the ControlNet module catalog number and click Next.

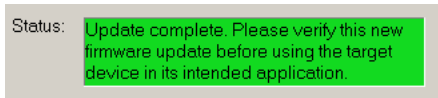


- d. Browse to the module and select it.



- e. Click OK.
- f. Select the firmware revision to update to and click Next.
- g. Click Finish.

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

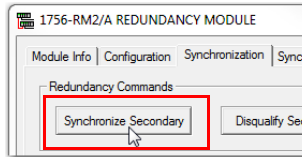


Wait for the update to complete.

18. Wait for communication to resume on the network.
19. Verify that the Synchronization Status tab indicates that the modules are fully compatible.

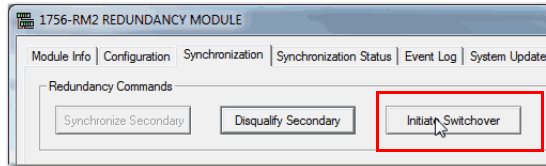
| Slot | % Complete | Module Name              | Module Revision | Secondary Readiness | State   | Compatibility |
|------|------------|--------------------------|-----------------|---------------------|---------|---------------|
| 0    | 100        | DB_1756-L73/A INT_7xR... | 24.50           | Synchronized        | Primary | Full          |
| 1    | 100        | 1756-RM2/A REDUNDAN...   | 20.5            | Synchronized        | Primary | Full          |
| 2    | 100        | 1756-EN2TR/C 217021900   | 10.7            | Synchronized        | Primary | Full          |
| 3    | —          | <empty>                  | —               | —                   | —       | —             |

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



Wait for synchronization to complete.

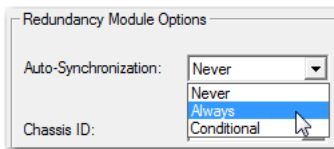
21. Initiate a switchover.



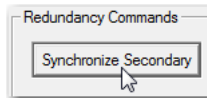
22. Remove the ControlNet modules from the new secondary chassis.
23. Make sure to match the node address of replacing the ControlNet module with existing module.
24. Insert the ControlNet module into the new secondary chassis, reconnect the module to the network, and turn on power to the chassis.
25. If you have not already done so, update the firmware of the ControlNet module in the primary chassis.

Complete these steps to verify module compatibility and synchronization.

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



2. If necessary, manually synchronize the chassis.



3. Click Apply, Yes, and OK.
4. Verify that the secondary chassis has qualified.



## Replace a 1756-RM Module with a 1756-RM2 Module

You can replace 1756-RM modules with 1756-RM2 modules without initiating a switchover.

1. Install the compatible version of the RMCT software.

You must shut down RSLinx Classic software to install the software, 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 or cables from both of the redundancy modules.
5. Close any open RMCT sessions that are 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.

Follow the procedure that is described in [EDS Files on page 38](#)

9. Update the primary and secondary 1756-RM2 modules 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.

**Notes:**

## Align LINT Members on 8-byte Boundaries

The Studio 5000 Logix Designer® application has requirements for data type use. The requirements differ based on the Logix Designer application version that you use.

| Logix Designer Application Version | Requirement   |
|------------------------------------|---|
| Version 26 or earlier              | Logix 5000™ controllers require all data types to be placed on 4-byte address boundaries in RAM.                    |
| Version 27 or later                | Logix 5000 controllers require 8-byte (64-bit) data types (LINTs) to be placed on 8-byte address boundaries in RAM. |

The Logix Designer application manages the requirement automatically, and the change has no effect on individual LINT tags, regardless of application version.

LINTs inside a UDT can be misaligned in these situations;

- You migrate a standard Logix Designer project, version 26 or earlier, to a redundancy project that is version 30.051 or later, and you have LINT tags inside a UDT.
- You migrate a redundancy project, version 24.053 or earlier, to a project that is version 30.051 or later, and you have LINT tags inside a UDT.

Additional pad bytes are added to the data structure to account for the misalignment. The pad bytes can cause an increase in the size of the UDT.

The possible effects of data structure changes, and subsequent actions that you can take as a result, are described in the rest of this section.

---

**IMPORTANT** You must also act when your application includes Logix 5000 controllers, version 26 or earlier, that communicate with Logix 5000 controllers, version 30.051 or later.

---

### *Possible Impact of Requirement Change*

You can adapt your project to accommodate larger structure sizes, if necessary. You can see the following effects due to the larger size:

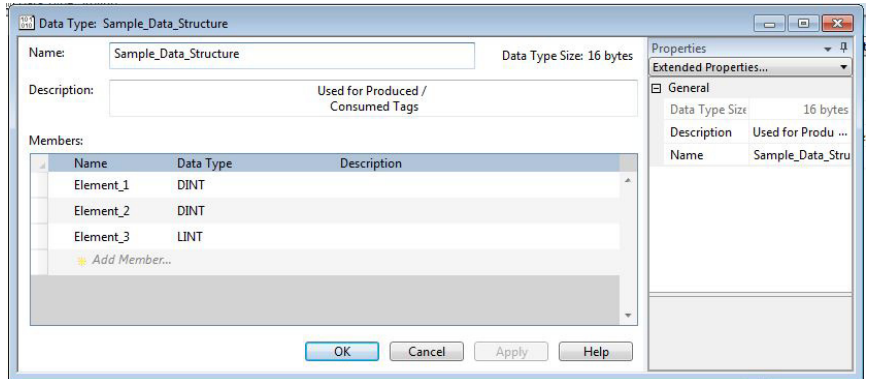
- Message instruction data lengths can require changes to complete successfully.
- Copy lengths of data structures can change.
- Produce/Consume connections to other Logix controller types can have data type mismatches and require changes to complete successfully.

To correct Produce/Consume errors that are caused by UDT alignment changes, modify the tag structures in both projects so that they match.

- Produce/Consume with Status requires an exact match of the UDT definition (including the name of the UDT definition).
- Produce/Consume without Status requires the Size of the UDT to match.

We recommend that you copy and paste the UDT definition from one project to the other to cover both of these cases. Use the Data Type editor to check the Data Type Size in both projects:

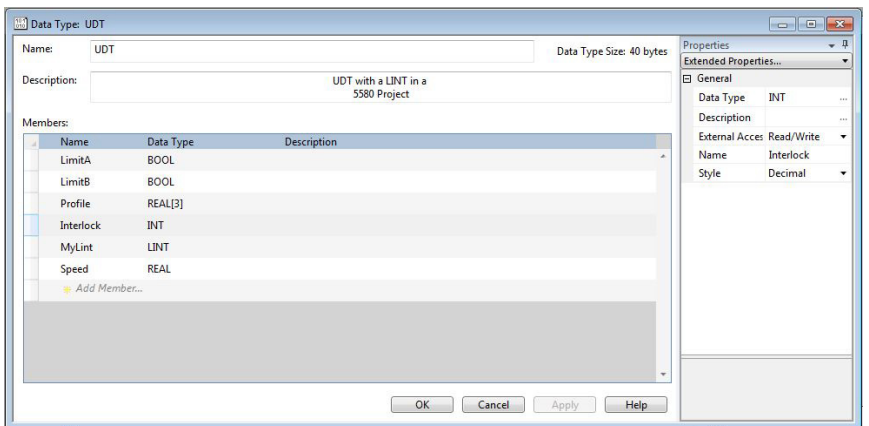
**Figure 1 - Data Type Editor**



If the data type size is different between the two projects, modify the UDT to produce the same internal data structure.

The following sample UDT illustrates how the 8-byte allocation rule and the 8-byte alignment rule cause a UDT to have another size.

**Figure 2 - UDT Sample - Needs Additional Memory Allocation and Alignment**



[Table 1](#) illustrates how this data structure maps in a Logix Designer project, version 24.053 or earlier. MyLint is split across two 64-bit words, and the total size is only 32 bytes.

**Table 1 - Data Structure for Logix Designer Projects, Version 26 or Earlier**

| Word | Elements           | Byte Mapping Table |     |     |             | 64 Bit Boundaries |
|------|--------------------|--------------------|-----|-----|-------------|-------------------|
| 0    | LimitA and LimitB  | Pad                | Pad | Pad | Hidden SINT | 0                 |
| 1    | Profile (Real [3]) | Map                | Map | Map | Map         |                   |
| 2    |                    | Map                | Map | Map | Map         | 1                 |
| 3    |                    | Map                | Map | Map | Map         |                   |
| 4    | Interlock (Int)    | Pad                | Pad | Map | Map         | 2                 |
| 5    | MyLint (LINT)      | Map                | Map | Map | Map         |                   |
| 6    |                    | Map                | Map | Map | Map         | 3                 |
| 7    | Speed (REAL)       | Map                | Map | Map | Map         |                   |

[Table 2](#) illustrates the hidden padding bytes that the Logix Designer application automatically adds to achieve the 8-byte alignment and allocation rules for a Logix Designer project, version 30.051 or later.

Consider the following:

- Padding is added in Word 5 so that MyLint starts at an 8-byte boundary.
- Padding is added in Word 9 so that the entire structure is a multiple of 8 bytes.

**Table 2 - Hidden Padding Added for Logix Designer Projects, Version 27 or Later**

| Word | Elements                      | Byte Mapping Table |     |     |             | 64 Bit Boundaries |
|------|-------------------------------|--------------------|-----|-----|-------------|-------------------|
| 0    | LimitA and LimitB             | Pad                | Pad | Pad | Hidden SINT | 0                 |
| 1    | Profile (Real [3])            | Map                | Map | Map | Map         |                   |
| 2    |                               | Map                | Map | Map | Map         | 1                 |
| 3    |                               | Map                | Map | Map | Map         |                   |
| 4    | Interlock (Int)               | Pad                | Pad | Map | Map         | 2                 |
| 5    | Padding for 8-byte alignment  | Pad                | Pad | Pad | Pad         |                   |
| 6    | MyLint (LINT)                 | Map                | Map | Map | Map         | 3                 |
| 7    |                               | Map                | Map | Map | Map         |                   |
| 8    | Speed (REAL)                  | Map                | Map | Map | Map         | 4                 |
| 9    | Padding for 8-byte allocation | Pad                | Pad | Pad | Pad         |                   |

To create a UDT that is the same size in all types of projects, insert additional data elements so that hidden padding bytes are not necessary.

The following sample UDT illustrates how UnusedDint1 and UnusedDint2 were added to create a UDT with the same size in a Logix Designer project, version 24.053 or earlier compared to a Logix Designer project, version 30.051 or later.

Figure 3 - UDT Sample - Memory Allocation and Alignment OK

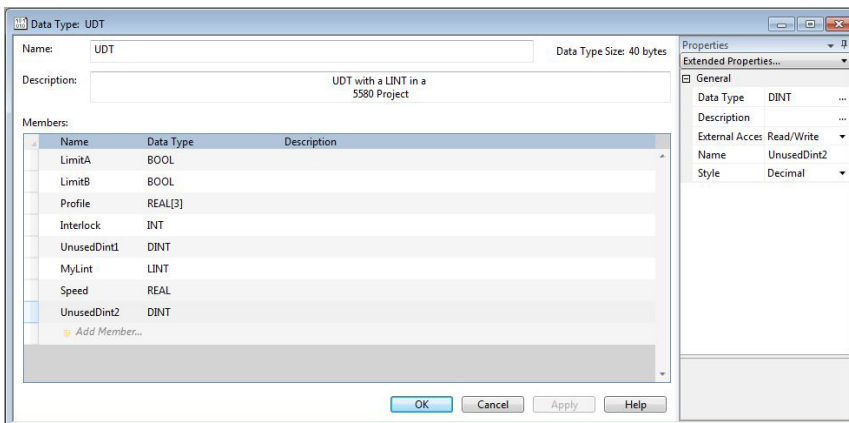


Table 3 illustrates how this data structure maps in all types of Logix 5000 controller projects:

Table 3 - Memory Map in All Project Types

| Word | Elements             | Byte Mapping Table |     |     |             | 64 Bit Boundaries |
|------|----------------------|--------------------|-----|-----|-------------|-------------------|
| 0    | Bools and 2          | Pad                | Pad | Pad | Hidden SINT | 0                 |
| 1    | Profile (Real [ 3 ]) | Map                | Map | Map | Map         |                   |
| 2    |                      | Map                | Map | Map | Map         | 1                 |
| 3    |                      | Map                | Map | Map | Map         |                   |
| 4    | Interlock (INT)      | Pad                | Pad | Map | Map         | 2                 |
| 5    | UnusedDint1          | Map                | Map | Map | Map         |                   |
| 6    | MyLint (LINT)        | Map                | Map | Map | Map         | 3                 |
| 7    |                      | Map                | Map | Map | Map         |                   |
| 8    | Speed (REAL)         | Map                | Map | Map | Map         | 4                 |
| 9    | UnusedDint2          | Map                | Map | Map | Map         |                   |

The concept is the same for nested UDTs. If the lower-level UDT is an 8-byte type (that is, it contains at least one 8-byte data element), you must align it to start at an 8-byte boundary.

To correct any mismatched UDTs, complete the following tasks in either project:

1. Start at the deepest nesting level of any multi-level UDT.
2. Work from the beginning of each structure and look for LINT data types.
3. For each LINT data type or 8-byte UDT encountered, map out the sizes of the prior UDT elements, to determine the byte offset at the start of the element.

If the byte offset for the first 8-byte element is not divisible by 8 bytes (64 bits), insert a DINT tag element just above the 8-byte element. You can use any name. Instructions do not need to reference this element.

4. Repeat the process until all 8-byte elements are aligned on 8-byte (64-bit) boundaries.
5. If needed, add a DINT at the end of the UDT to satisfy the 8-byte allocation rule.
6. Continue up through nested UDTs until the top level is correct.

When the tasks are completed, the UDTs are the same size in the Logix Designer project, version 24.053 or earlier and the Logix Designer project, version 30.051 or later.

A useful technique when creating UDTs is to start with the largest data types first, and work down through 8-byte, 4-byte, 2-byte, 1-byte, and finally single-bit data types. The resultant mapping is 64-bit-aligned in all controller types, so no manual padding is required.

Produce/Consume with Status and Safety Produce/Consume tags require an adjustment to this technique. For these cases, the UDT must start with a 4-byte 'COMMAND\_STATUS' element; therefore, one more 4-byte element (DINT or REAL) must be added before placing any 8-byte elements.

**Notes:**



## Notes:

# Rockwell Automation Support

Use these resources to access support information.

|   |  |  |
|---|--|--|
| <b>Technical Support Center</b>                         | Find help with how-to videos, FAQs, chat, user forums, and product notification updates.                   | <a href="http://rok.auto/support">rok.auto/support</a>             |
| <b>Knowledgebase</b>                                    | Access Knowledgebase articles.   | <a href="http://rok.auto/knowledgebase">rok.auto/knowledgebase</a> |
| <b>Local Technical Support Phone Numbers</b>            | Locate the telephone number for your country.  | <a href="http://rok.auto/phonesupport">rok.auto/phonesupport</a>   |
| <b>Literature Library</b>                               | Find installation instructions, manuals, brochures, and technical data publications.                       | <a href="http://rok.auto/literature">rok.auto/literature</a>       |
| <b>Product Compatibility and Download Center (PCDC)</b> | Get help determining how products interact, check features and capabilities, and find associated firmware. | <a href="http://rok.auto/pcdc">rok.auto/pcdc</a>                   |

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